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Planning of land-use developments and transport systems in airport regions

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Kurzfassung

Die enge Korrelation in der Entwicklung neuer Flächennutzungen und Verkehrssysteme ermöglicht und erfordert die Verknüpfung und Integration beider Planungsstränge. Am Beispiel der Auswirkungen von Flächennutzungsänderungen auf die Verkehrsinfrastruktur wird deutlich, dass formelle Planungsinstrumente schnell an ihre Grenzen stoßen und eine effiziente Integration von Flächennutzungs- und Verkehrsinfrastrukturplanung in Flughafenregionen nicht möglich ist. Flughäfen sind als strategische Instrumente einer erfolgreichen wirtschaftlichen Entwicklung auf regionalen bis internationalem Niveau anerkannt. Folglich kann die Entwicklung der Verkehrsinfrastruktur in Flughafenregionen nicht losgelöst von der Entwicklung der Flächennutzungen betrachtet werden. In diesem komplexen Spannungsfeld werden informelle Planungsverfahren ergänzend eingesetzt, um bestehenden Mängeln und Defiziten formeller Verfahren vorzubeugen.

Basierend auf einer Analyse von sieben Fallstudien in drei Flughafenregionen in Nordwesteuropa kann gefolgert werden, dass formelle und informelle Verfahren wichtige Planungsinstrumente für die Erreichung wesentlicher Ziele einer integrierten Planung von Flächennutzung und Verkehrssystemen sind. Mithilfe einer angepassten Verteilung auf und einer umfassenden Koordinierung zwischen formellen und informellen Verfahrensschritten können Konflikte zwischen unterschiedlichen Interessen vermieden, Zeit- und Kostenvorteile erzielt und eine verbesserte Effizienz des Gesamtprozesses erzielt werden.

Abstract

Since transport and land-use are closely interrelated, an integrative approach for land-use and transport planning should be adopted. In the case of impacts of land-use development projects on transport system in airport regions, Formal planning procedures alone are not able to create the efficient integration of land-use and transport in airport regions. Airports are recognised as strategic instruments for the development of local and regional economics and stimulation of their competitiveness at the continental and global levels. Therefore, the development of transport infrastructures and of land-use and airport regions cannot be looked at separately. In such complex situations, informal planning procedures are nominated as a supplementary to fulfil the deficiencies of formal planning procedures.

Based on the analysis of seven case studies in three airport regions in North Western Europe, it can be concluded that both formal and informal procedures are important planning instruments for achieving goals of integrated planning of land-use and transport in airport regions. By the appropriate division of responsibilities and suitable co-ordinations between formal and informal procedures, high efficiency of enabling high-quality results, avoiding conflicts among stakeholders, and optimising cost effectiveness and time efficiency would be accomplished.

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List of Key-Word Definitions

Accessibility	the capability of being reached by transport means
Airport	a place from which aircraft operate that usually has paved runways and maintenance facilities and often serves as a terminal for different transport means
Airport area	an area containing an airport
Airport city	the more or less dense cluster of operational, airport-related activities as well as other commercial and business activities on and around the airport (however, this cluster is called an “airport city” only if it has the qualitative features of a city: density, access quality, environment, service, etc.)
Airport region	a region containing an airport
Assessment	a judgement based on the results of an analytical procedure using pre-defined criteria
Case study	a detailed investigation of the development of a particular project
Criterion	one of a set of requirements which is a necessary part of an assessment procedure
Goal	a statement of the direction towards which planning is aimed
Indicator	a measure of a criterion
Inputs	required data for a process
Integrated planning	planning that includes many different stakeholders and/or ideas

Land-use	the socio-economic technical description of an area
Mobility	the ability of an individual, individuals, or groups of individuals to physically move from one place to another
Objective	a measurable milestone towards a goal
Outputs	end-products delivered by a process
Participation	act of being involved in an activity
Planning	the systematic and comprehensive study of all features of a project, problem, or policy issue and the devising of one or more alternative conceptual approaches to addressing the project, problem, or issue
Procedure	a series of actions conducted in a certain order
Process	a series of actions over a specific time period for achieving a particular result(s)
Project	a carefully proposed design for realising a plan
Requirement	something that is needed for attaining a goal
Stakeholder	an institution, organisation, group, or individual that has some interest in a particular project
Transport	a system for carrying passengers or goods from one place to another

Executive Summary

The presence of an international airport makes an airport region different from general metropolitan regions. Since air traffic is an important means of transport, airports became critical assets for regions. They promoted capital investment and created employment in a wide range of activities. International airports are playing the role of regional and national intermodal interchange hubs. Accordingly, it is necessary to maintain the performance of airports at high quality levels, and airport accessibility is one of the important factors for evaluating an airport's performance.

With highly competitive situations in air transport services, several airports proposed their own expansion projects. Areas adjacent to the airport, so-called "Airport Cities", also have a crucial opportunity to be developed into air transport related activities and other commercial purposes. For this reason, a number of large public projects were developed. Additional trips created by these projects affected the quality of the airport's accessibility. A formal procedure and an informal one were conducted in the development projects in airport regions in order to create an efficient integration of the projects and of the regional infrastructure.

Procedures for Integrated Planning

Since transport and land-use are closely interrelated and co-determine each other, an integrative approach for land-use and transport planning should be able to create co-ordination across planning levels (national, regional, and local) and across planning sectors (land-use and transport). In planning law, the integrated planning of land-use and transport is usually conducted by a legally-binding planning instrument – a formal planning procedure – to ensure the effective integration of the proposed projects and the regional transport infrastructure. However, in some special areas like an airport region, a formal procedure alone might not be able to completely create an efficient integration of land-use and transport. Airports are recognised as strategic instruments for the development of local and regional economics and stimulation of their competitiveness at the continental and global levels. Therefore, the development of transport infrastructures and of land-use and airport regions cannot be looked at separately. To avoid the deficiencies of a formal procedure, an additional informal procedure is considered as an important instrument of assistance.

In this study, a goal system on planning procedures was developed with the overall goal of "efficient integration of land-use and transport in airport regions". This goal led to the three following objectives:

- to enable high-quality results
- to avoid conflicts among stakeholders
- to optimise cost effectiveness and time efficiency

Then, the requirements of each step of the planning procedure were designated. Enabling high-quality results requires the consideration of all relevant inputs, exact investigation of the impacts of a project on the transport system, appropriate selection of the procedure, ensuring accessibility, and gaining acceptance by stakeholders. To avoid conflicts among stakeholders means opening to every stakeholder; processing with a fair and understandable procedure; avoiding conflicts after decision-making; and appropriate reporting of process and procedure results. The requirements for optimising cost effectiveness and time efficiency were to minimise cost and time spent on all steps of the procedure; to avoid causes of the delays of the project; and to enable the continuation of the procedure. This goal system was the framework used for further evaluation of the implemented formal and informal procedures in the case studies and in the proposed planning procedures.

Selection of Case Studies

This study analysed major projects which were likely to create a high impact on airport accessibility. Two criteria – traffic volume generated by a particular project and impact on airport accessibility – were designated for selecting projects. Projects which generated high traffic volume and had high impact on airport accessibility were further investigated. The criterion for selecting airport regions was the distance of the airport from the metropolis. Three major airports in North Western European nations, which are located closest to their metropolises – Amsterdam, Frankfurt and Zurich – were selected for this study. The airport region in each metropolis was divided into three areas – airport area, airport city, and airport region. In each area, one project was chosen as a case study. Therefore, it was planned to have three case studies in each investigated airport region – a new runway project, a commercial centre in an airport city, and a large public project in an airport region. So, there should have been nine case studies available for use in this study. However, two projects had to be deleted from the study. Projects in the Airport City of Amsterdam Airport Schiphol had used a different informal procedure which emphasised a special legal-binding land-use plan, but not for any particular projects. Project Bützenbuhl of Zurich Unique Airport was cancelled due to financial problems. Thus, there were seven case studies left for further investigation.

Assessment of Planning Procedures

Starting with the planning system in different countries, the seven selected projects were studied relative to the sufficiency of their basic information and how they were implemented through formal and informal procedures. A review of the literature was conducted first. Afterwards, a mail survey with personal or telephone follow-up interviews – dependent on the situation – were used to obtain missing information. A questionnaire was designed following the goal, objectives, and requirements of planning procedures. Three target interviewees who had a high degree of influence on the project were identified, namely the organiser of the informal procedure, the responsible planning authority, and the airport authority.

This study required an assessment method for qualitative data gathered through low expenditures but had high accuracy and which was unbiased. Among the five available assessment methods, a Goal-Achievement Matrix was judged to be the most suitable tool for evaluating information obtained from the literature review and other interviews. Responses from the interviewees were interpreted by means of different evaluation scales.

The results – which were sorted out into three approaches: particular projects, project's locations, and airport regions – indicated the deficiencies of the implemented formal procedures in creating an efficient integration of land-use and transport. Fixed by planning laws and regulations, a formal procedure was able to create moderate to relative high quality results. The major deficiencies of formal procedures were in the objective "to avoid conflicts among stakeholders" and "to optimise cost effectiveness and time efficiency". These deficiencies caused a large amount of budget and lengthy resolution processes.

The results from the implemented informal procedures varied case-study by case-study. Informal procedures, which are composed of all relevant stakeholders, described exact impacts on the transport system, and conducted with an appropriate formation relative to its conflict intensity, were able to ensure both regional and an airport's accessibility with acceptance by all stakeholders. Conflicts, which might cause delays of a project, were likely to be eliminated with appropriate budget and time spent. However, some informal procedures could not provide much assistance to their formal procedures because some relevant stakeholders were missing from the informal procedures and the selected formations did not fit with their conflict intensity. Some informal procedures could not avoid conflicts among stakeholders, but proceeded within an appropriate budget and time period.

Projects in airport areas – airport expansion projects – were considered as a national issue. Formal and informal procedures for these projects were focused on the economic and environmental conflicts. The ground access system was considered as a complimentary part of the entire planning system. Therefore, transport planning would follow the solutions from the major conflicts on economic and environmental aspects. It was not possible to define common results from the projects in airport cities because there was only one case study in this category. The assessment of the efficiency of implemented procedures for the projects in airport regions showed a lack of consideration of an airport's accessibility.

Recommendations

The results from the Goal-Achievement Matrices and evaluation charts indicated that some informal procedures could not compensate for the deficiencies of formal procedures in some requirements. And, some requirements, which a formal procedure alone could completely achieve, were repeatedly processed in an informal procedure. These results guided the design of the proposed planning procedures. Conceptually, formal and informal procedures should work together – with appropriate division of responsibilities – to achieve the goal of integrated planning.

The proposed procedure for integrated planning of land-use and transport in airport regions consists of eleven steps. The beginning step is the "Identification of Principle Concepts of the Project", by considering the issue, relative to the project. Then, the "Preliminary Evaluation" is done by the proposed project's owners with co-ordination of the responsible planning authorities. The "Evaluation of the Existing Formal Procedure" draws a draft boundary of scope and scale of the proposed project's impacts. After this step, the responsibility should be efficiently divided into formal and informal procedures. The "Determination of the Project" indicates the information to be considered in each planning procedure. Goal on each planning procedure is identified in the step "Identification of Goals". The following five steps – Identification of Conflicts, Selection of Participants, Investigation of Impacts, Formulation of Results, and Production of Reports – are processed by the "Processing of Discussion and Negotiation".

Both formal and informal procedures are important planning instruments for achieving the goal of integrated planning of land-use and transport in airport regions. By the appropriate division of responsibilities and suitable co-ordinations between formal and informal procedures, high efficiency of enabling high-quality results, avoiding conflicts among stakeholders, and optimising cost effectiveness and time efficiency would be accomplished.

1. Interrelation of Land-use and Transport

1.1. Introduction

Transport and activity patterns are closely interrelated. The principle of transport study comes from the idea that spatial separation of human activities leads to the need for travel and for goods transport. And, in terms of reverse impact, a transport system creates the potential for development of, or disadvantages to, the use of land and its activity system. Generally, trip-making patterns, volumes, and modal distributions are largely a function of the spatial distribution of land-use. Likewise, pattern of use is influenced by the level of accessibility provided by the transport system from one activity area to another.

Although it is accepted that the integration of land-use and transport planning plays a crucial role in regional development, there have been few studies and research activities in this area.

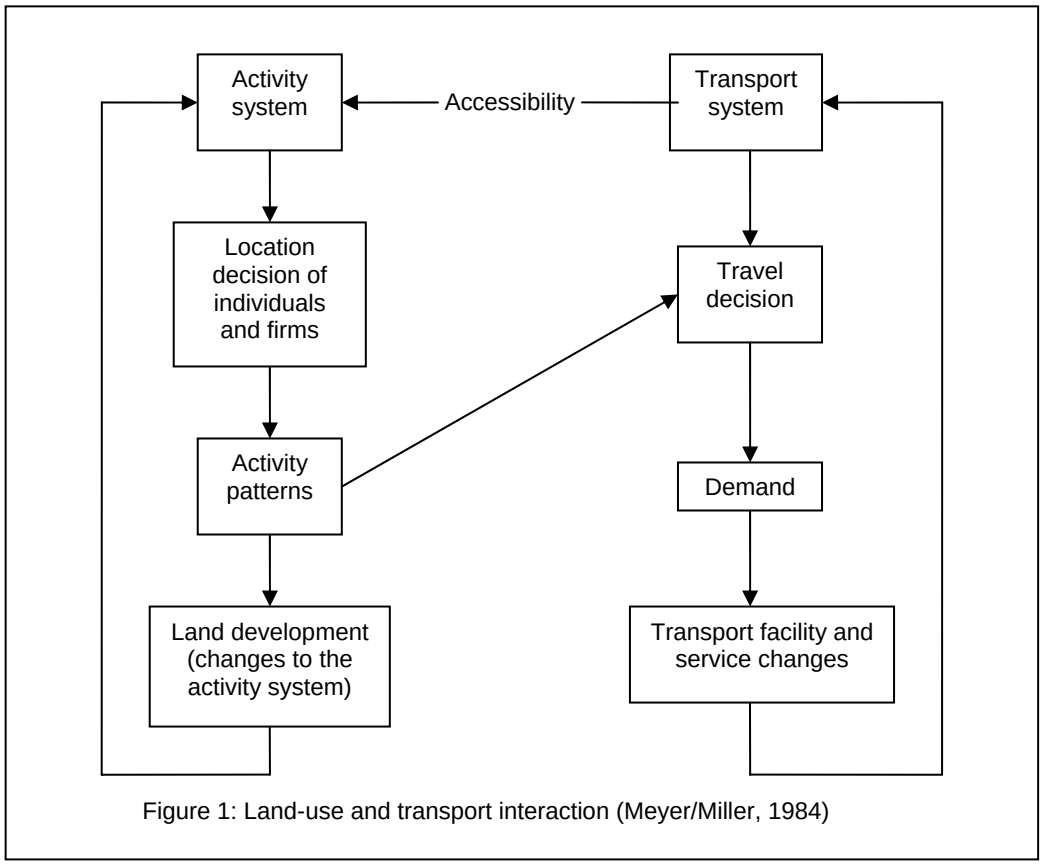


Figure 1: Land-use and transport interaction (Meyer/Miller, 1984)

According to the concept that trip and location decisions co-determine each other, Meyer and Miller (1984) explained this interrelation by the notion of “land-use and transport interaction” (see Figure 1). The development of land for a particular use resulted either in the generation of new trips originating

from that area, or new trips attracted to that area, or both. The development of land created new travel demands and, consequently, a need for transport facilities whether in the form of new infrastructure or more efficient operation of existing facilities. Such improvements to the transport system made land more accessible to existing activity centres, thereby making it more desirable and affecting its monetary value. Increased accessibility and improved land values, in turn, influenced the location decisions of individuals and firms, once again spurring new land development and starting this cycle again until an equilibrium was reached or until some other external factor intervened.

Meyer and Miller (1984) concluded that land-use development and the provision of transport services and infrastructure are functions of one another. In the past, when settlement areas were experiencing demand of rapid expansion and growth, the location of transport facilities provided a strong means to influence the direction of this growth. In more recent times, it has become apparent that, although the overall regional impact of new investment on transport facilities on settlement structure is often negligible, the distributional impact on new development within a region can be substantial, given the right circumstances. With a high level of accessibility already available through existing transport systems, the use of transport investment by itself to influence land-use is likely to produce minimal results.

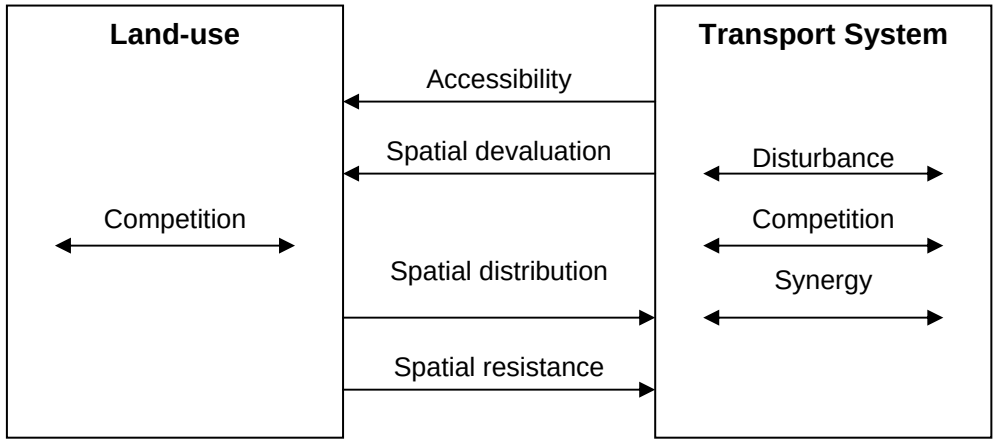


Figure 2: Interrelations of Land-use and Transport (Krug, 2002 online)

Furthermore, Krug (2002, online) also discussed the interrelations of land-use and transport. He indicated the interrelations in four aspects (see Figure 2).

- Transport systems provide accessibility to the settlement structures.
- Settlement structures are also destroyed by that accessibility.

- o On the other hand, settlement structures provide an opportunity for spatial distribution to transport systems.
- o Transport systems are also spatially limited by settlement structures.

The project *TRANSLAND of the 4th RTD framework programme of the European Commission* (Greiving and Kemper, 1999) indicated a recognition that trip and location decisions co-determined each other. Boltze (2002) also discussed about the forward and backward impacts between land-use and transport. Therefore, the need for transport and land-use planning to be co-ordinated led to the notion of the "land-use transport feedback cycle". The set of relationships implied by this term could be briefly summarized as follows: (see Figure 3)

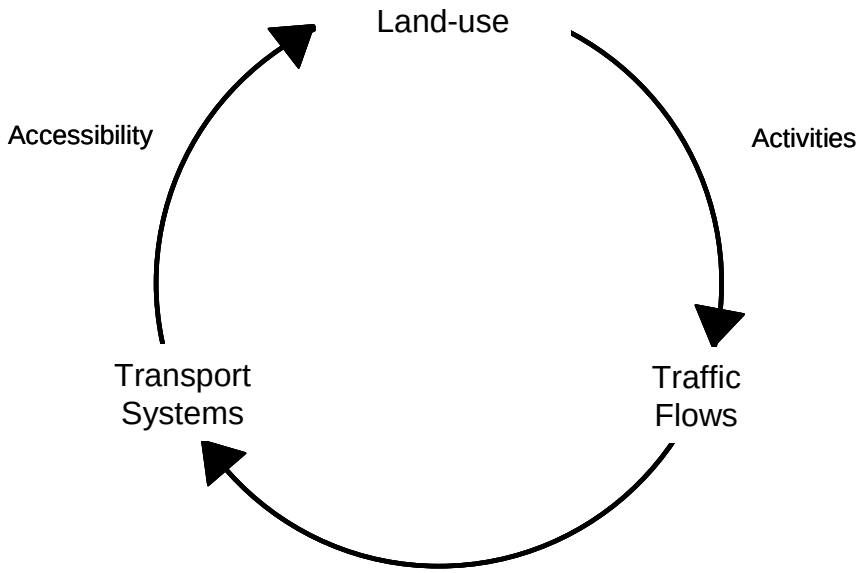


Figure 3: Land-use transport feedback cycle (adapted from Boltze, 2002 and Greiving and Kemper, 1999)

The distribution of land uses, such as residential, industrial or commercial, over the urban area determines the locations of human activities such as living, working, shopping, education or leisure. The distribution of human activities in space requires spatial interactions in the term of trips or traffic flows on the transport system to overcome the distance between the locations of activities. The distribution of traffic flows requires the infrastructure in the transport system as the space for their traffic volume. The distribution of infrastructure in the transport system creates opportunities for spatial interactions and can be measured as accessibility. The distribution of

accessibility in space co-determines location decisions and so results in changes of the land-use system.

The major theoretical approaches to explain this two-way interaction of land-use and transport include technical theories (urban mobility systems), economic theories (cities as markets) and social theories (society and urban space).

Since the interrelation of land-use and transport is clear in the concept, most research on the interrelation of land-use and transport system was conducted and reported in site-specific studies.

1.2. Integrated Planning of Land-use and Transport

Although there are considerable variations in planning systems across different countries, the lack of integration of land-use and transport planning could be considered as a general similarity. However, ongoing changes in a "planning paradigm" could contribute to a more integrative approach in many countries. For example, Wegener and Fürst (1999) proposed the integration process of land-use and transport planning by "Vertical and Horizontal Co-ordination"[1] (see Figure 4).

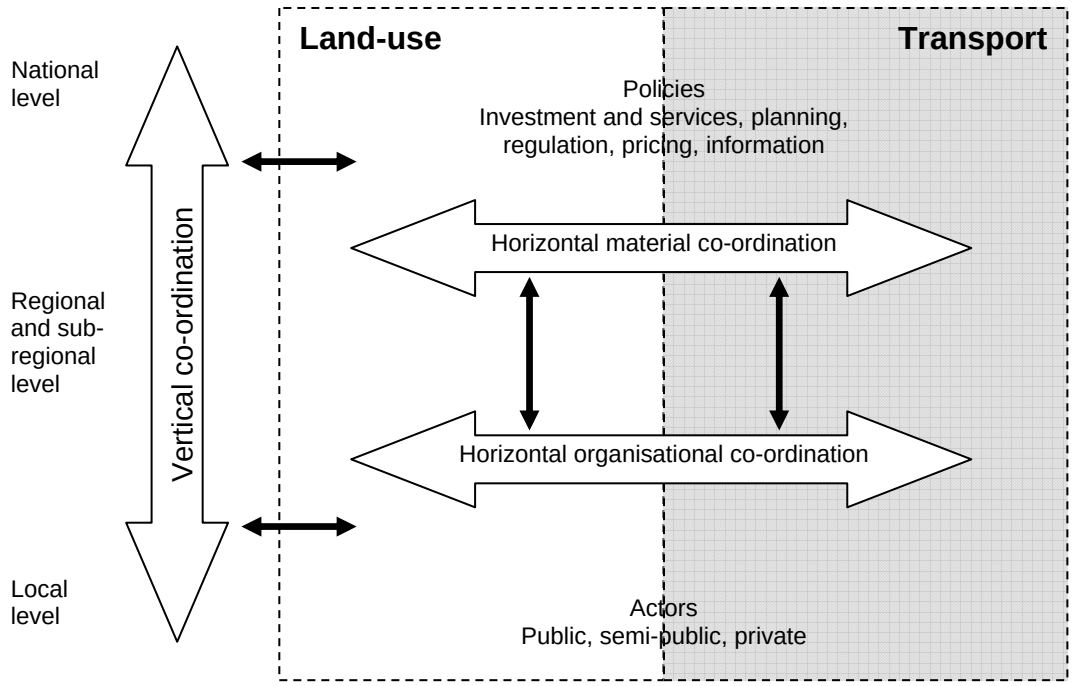


Figure 4: Co-ordination and integration of land-use and transport planning (Wegener / Fürst, 1999)

Vertical integration is already required by planning regulations in most countries and supported by a formal process. But, the hierarchical character of a planning administration's structure usually limited the roles of lower-level authorities in expressing their points of view and in making a decision.

Horizontal integration, on the other hand, is not required by formal planning regulations in most cases. It depended on informal concentration activities only, and was not sufficiently attained in many planning processes. A lack of horizontal integration led to inefficient planning and conflicts among stakeholders (Wegener and Fürst, 1999).

1.3. Specific Needs of Airport Regions

International airports have been increasingly recognised as strategic instruments for the development of local and regional economics and stimulation of their competitiveness at the continental and global levels. They tend to promote capital investment and to create employment in a wide range of activities. They produce significant indirect, induced effects on jobs, industries, and revenues on a broader scale. The economic impact of an airport produced a strong polarisation between connected activities on the site and around it, (airlines, airport operators, handling agents, control authorities, concessions, aircraft servicing, warehousing, etc.), and spread the effects of these activities (jobs, traffic, etc.) on a much broader scale at the regional level and beyond. This polarisation of activities and jobs could cause other effects, e.g. on traffic patterns and intensity, on workforce demand, on local facilities, and housing demand. Furthermore, airports may play the role of regional and national inter-modal interchange hubs according to their locations on the crossroad of different modes of transport and different scales of mobility. Airports and the other activities in the regions are inter-dependent. The development of transport infrastructures and of land-use in airport regions cannot be looked at separately anymore (Klop, 2000). The specialities of airport regions, as explained above, make planning in airport regions different from planning in other regions.

It is evident that the potential for economic growth around an airport not only depends on the capacity of the airside facilities, but is also directly related to the quality of landside accessibility of the airport. And vice versa, the quality of access depends on the monitoring and control of the growth of the developments in airport regions.

[1] in Grieving / Kemper, 1999

Many airport regions are facing serious bottlenecks in accessibility in the years to come, as land-use strategies – or less co-ordinated development initiatives – have been hurrying ahead of initiatives to improve transport networks. The enclosure of an airport within a metropolitan area leads to co-ordinate accessibility and land-use development. The uncontrolled exploitation of the development potential in airport regions conflicts with the primary aim – to keep the airport itself accessible. Measured against the natural growth of traffic movements in the region, the effect of increasing passenger and commuter traffic from and to the airport on landside traffic is rather small (e.g. at Amsterdam Airport, traffic induced by the airport amounts to only 12% approximately). But together they have a cumulative effect, creating heavy congestion, particularly in the airport area (Güller Güller architecture urbanism, 2001).

To overcome these threats and to guarantee accessibility, effective agreements among stakeholders of each proposed project are needed, not only to improve public and road infrastructure, but also to co-ordinate land-use and transport planning in the airport region and to avoid respective imbalances. Fully integrated concepts become more and more relevant. Network integration is a prerequisite for development. Accessibility is not only vital for an airport, but a guarantee for the overall investment climate and attractiveness of an airport region. Concepts to improve the accessibility and the position of the airport in the transport networks are to be developed alongside strategies to stimulate and co-ordinate the economic, social, and environmental development at the airport and in the airport region.

In order to create suitable procedures for integration of land-use and transport for projects in airport regions, the procedures should be able to yield high-quality results. They should be able to consider all relevant inputs relative to the impacts of the proposed projects. Projects' impacts on the transport system should be precisely described. Discussion methods should be appropriate to the level of conflicts caused by the projects. The results of planning procedure should ensure accessibility and gain acceptance by stakeholders.

Furthermore, the planning procedures should be able to avoid conflicts among stakeholders. All stakeholders should have an appropriate opportunity to share their opinions. All stakeholders, although they always have different backgrounds, should be able to efficiently participate in the procedures. The results should be able to create a win/win-situation. Also, the results of these procedures should be appropriately distributed to the stakeholders.

Therefore, suitable procedures should require an appropriate budget and timeframe. The cost and time of providing inputs and processing the procedures should be optimised. Appropriate planning procedures should be able to avoid the cause of delaying the projects, and the planning procedures should continue until the projects are completely done.

1.4. Statement of the Problem

In most countries, methodologies for integration of land-use and transport planning are already stated in planning regulations. Formal procedures allow public and private stakeholders to participate and to share their opinions relative to the proposed projects prior to the grant of a building permit. However, formal procedure alone cannot fulfil the requirements of integration across planning levels and sectors. Opinions of stakeholders, who are not able to participate in formal procedures, are always omitted. Impacts of the proposed projects are investigated by the planning authority alone. It has no effective instrument to balance the conflicts of interests among stakeholders. Also, the results from a formal procedure are whether or not the proposed projects will be granted permission by the building authority without co-operative decision making.

Under the current high competition in air transport services, several major hubs in Western Europe (e.g. Amsterdam, Frankfurt, London, and Paris), have planned to expand their airports to meet the increasing demand over the next two decades. Also, other international airports, for example Copenhagen, Milan and Zurich, are trying to develop themselves to be other hubs. With this trend, not only airport expansions, but projects in airport cities and large public projects in airport regions have also been created to attract air transport-related activities and international investment.

However, these projects are usually accompanied by protests in several aspects, which lead to stalemated conflicts and delays of the projects. Economic, social, and environmental impacts created by these projects are substantial and affected a large number of stakeholders, from local to national levels and, in some cases, to the international level as well. Formal planning procedures alone are not able to respond to these complex situations. Therefore, informal procedures have been selected as a supplement to formal procedures. Unfortunately, there are still some doubts about the efficiency and effectiveness of the co-ordination between formal and informal planning procedures. Some co-ordinations yielded low-quality results; some of them were not able to avoid or mitigate conflicts among stakeholders; some of them required high budget and a very lengthy process. In this study, these doubts

were the basis for further investigation, assessment, and elaboration of guidelines for planning procedures in airport regions.

1.5. Objectives of the Study

The purpose of this study was to determine suitable procedures for creating a quality interrelationship between land-use and transport planning in airport regions.

This study aimed at answering two key questions:

- "***Which procedure***" for integrated planning is appropriate to create an integration of land-use and transport in airport regions?
- "***How***" should that appropriate procedure be applied?

The main activities used to determine answers to the key questions were:

- *Overview*: The requirements on procedures for integrated planning, project types, and available procedures were identified and classified.
- *Investigation*: According to classifications from the overview, the planning system, projects, formal and informal procedures, and actual requirements of procedures for integrated planning were identified by interviews and review of the literature.
- *Assessment*: The ability and performance of each available procedure for integrated planning of land-use and transport in airport regions were estimated.
- *Recommendation*: Guidelines and recommendations for further applications were formulated.

1.6. Methodology of the Study

In order to achieve the objectives of this study, the methodology of the study was designed as follows:

1. The goal, objectives, and requirements of procedures for integrated planning of land-use and transport, both for general and specific purposes in airport regions, were identified (WP-2.1).
2. Criteria for classifying projects in airport regions were determined which indicated different degrees of need for procedures for integrated planning for different types of projects (WP-2.2).
3. Available procedures, both formal and informal procedures, for integrated planning were collected as alternatives to create high-quality land-use and transport situations (WP-2.3).
4. By means of a review of the literature, personal interviews, and assessments, the situations of individual case studies were identified and their requirements for procedures for integrated planning were analysed. Moreover, each available procedure was analysed using the same

framework corresponding to the requirements on that planning procedure (WP-3).

5. In order to assess the efficiency of each available procedure, in support of the requirements of the planning procedure for each case study, the goal, objectives, and requirements of the assessment process, indicators, and assessment matrix were established (WP-4).
6. From the results of the assessment process, guidelines and recommendations were formulated (WP-5).

The conceptual framework of this study is illustrated in Figure 5.

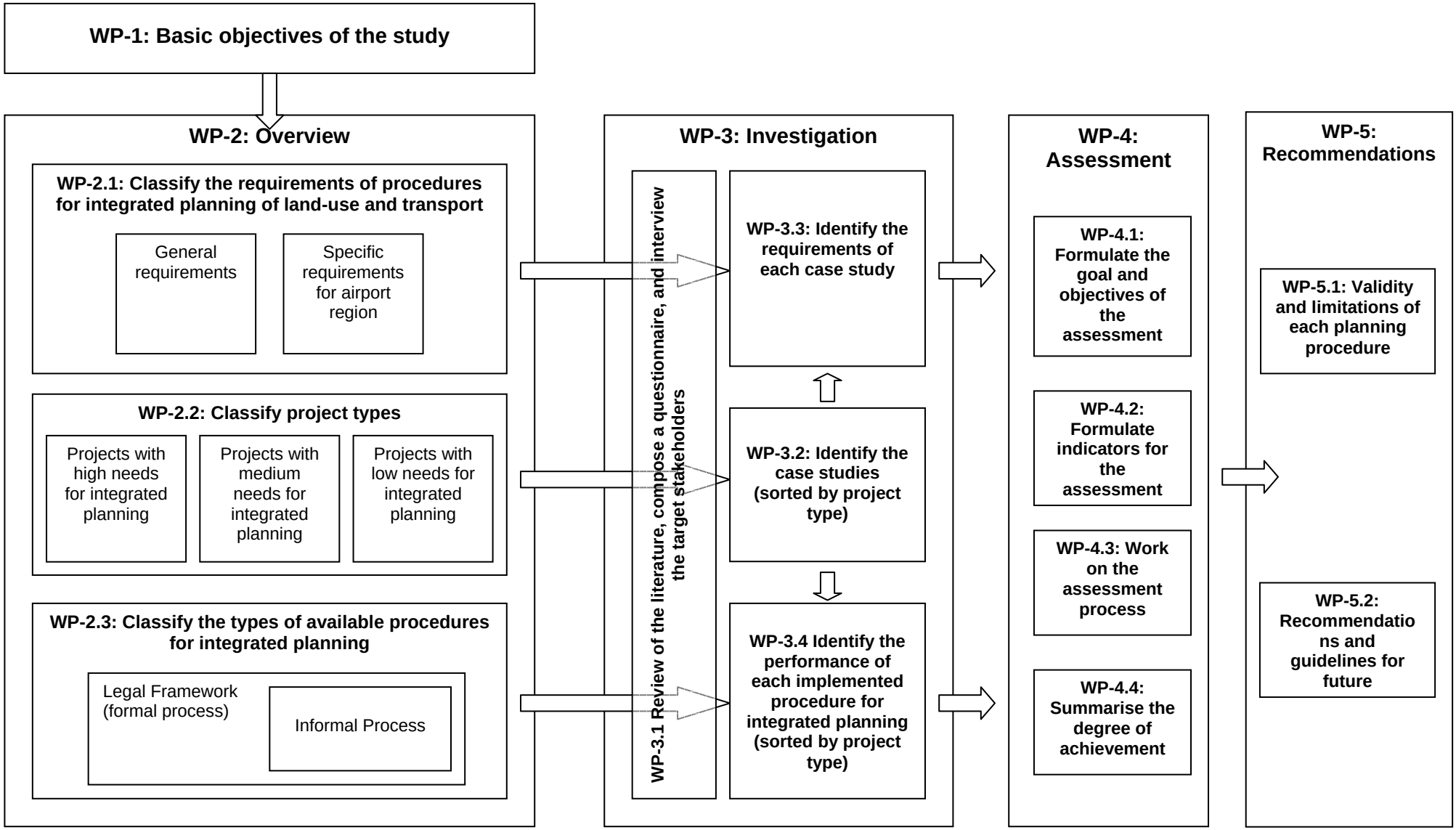


Figure 5: Conceptual framework of the study

2. Procedures for Integrated Planning

2.1. Introduction

This part of the study contains an overview of planning, projects, and procedures for planning of airport regions. It consists of sub-chapters that explain the general ideas of procedures for integrated planning of land-use and transport in airport regions:

Chapter 2.2, “Planning Procedures”, contains the definitions of and available procedures for both formal and informal planning. Criteria for selecting the appropriate procedures for integrated planning of land-use and transport were identified.

Chapter 2.3, “Applications in Airport Regions”, contains an overview of integrated planning of land-use and transport, both in general and in special cases such as airport regions. Also, the goal, objectives, and requirements of procedures for integrated planning of land-use and transport in airport regions were identified.

2.2. Planning Procedures

2.2.1. General Information

Given the frequency of conflict over comprehensive planning, planners should design procedures for integrated planning which dealt consistently with disagreements. Three linked factors were important in the design of such approaches: (1) a formation, (2) a forum, and (3) the intensity of conflict. Figure 6 illustrates an integration approach that tied formations and forums together to conflict intensities. As conflicts escalated, more formal means and settings were required for resolution (Kaiser et.al., 1995).

The *Formation* for integrated planning may range in formality from simple face-to-face negotiations among the affected parties to contracting with a professional outside mediator or arbitrator. Susskind and Cruikshank (1987) identified the range of procedures as[2]:

1. *Direct, or unassisted, negotiation*, in which the parties met together on their own to work things out.
2. *Facilitation*, in which a third party assisted in making the negotiation process work through helping with procedures, communications, and logistics. Most informal procedures in this study were conducted by this formation.

[2] in Kaiser et.al., 1995

3. *Mediation*, in which a third party helped with both the process and the substance of proposed agreements, met privately with each side as well as in joint sessions, and sought to formulate win-win agreements that met joint interests. (An example of an informal procedure with this formation is the *Mediationsverfahren* for the fourth runway project at Frankfurt Airport.)
4. *Arbitration,* in which a private judge or panel listened to both sides and suggested a solution that the parties could accept or reject. The arbitrator's decision was final. Normally, formal procedures are conducted by this formation, under the framework of planning laws and regulations.

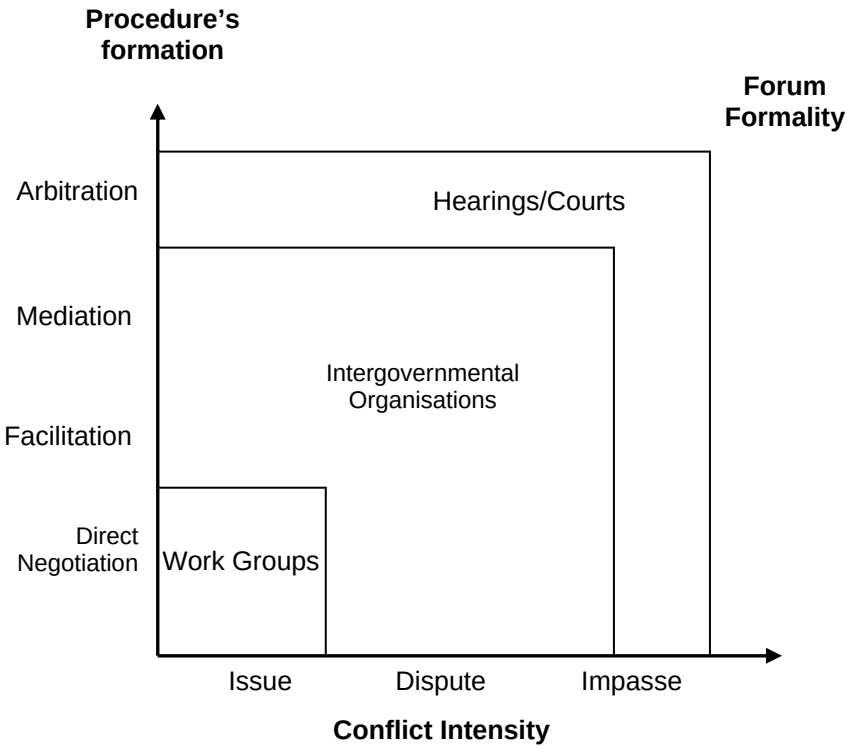


Figure 6: Linked factors for designing procedures for integrated planning (Godschalk, 1992, in Kaiser et.al., 1995)

Forum, the type of settings in which conflicts are addressed, range from informal meetings among stakeholders to hearings that judges and attorneys conducted according to strict legal procedures.

1. *Work groups*: Many disagreements can be eliminated at their early stages through preliminary proposal reviews in the planner's office or at planning board work sessions. (E.g. the informal procedure for the *Entwicklungsleitbild* of the Zentrum Zürich Nord was processed by a work group.)

2. *Intergovernmental organisations*: More difficult conflicts can be tackled in special work groups or task forces. Intergovernmental organisations, such as councils of government, can be neutral settings for negotiation or mediation involving elected officials. Most informal procedures in this study were processed by this type of forum.
3. *Hearings / Courts*: More formal administrative hearings before a hearing officer or lawsuits before a judge tend to encourage adversarial rather than negotiation behaviour. Most formal procedures included public hearings based on the nature of this forum.

Conflict intensity is the key factor for choosing a forum and its formation. If assumed to be a generic term of disagreement, it led to three different intensity levels being defined (Godschalk, 1992)[3]:

1. *Issues* are technical problems which involved moderate levels of disagreement, were susceptible to solution through informal negotiation or facilitation among planners and affected interests, and took place within a semiformal process or organisation, such as a work group.
2. *Disputes* are unresolved issues that have become politicised and escalated to substantial intensities of disagreement. They required formal negotiation or mediation which involved planners, elected officials, and affected interests within existing governmental organisations or conflict management groups. Most conflicts in this study were at this level of intensity.
3. *Impasses* are stalemated disputes which involved overwhelmingly intense disagreement, good faith efforts had broken down, and formal arbitration in a hearing or courtroom setting was required for resolution. Conflicts on environmental aspects, and between economic and environmental aspects, reflect this level of intensity.

In the integration of land-use and transport planning, each land-use change or project created different degrees of conflict intensity among the affected stakeholders. For this reason, procedures and forums for integrated planning were different project-by-project.

2.2.2. Formal Planning Procedures

Formal planning procedures are planning instruments regulated by planning laws and other formal regulations in order to make a decision on approving a proposed plan. The formation, structure, and results of a formal procedure are prescribed by these planning regulations. The formation is generally

[3] in Kaiser et.al. 1995

arbitration, in which a responsible planning authority is the sole decision-maker.

Generally, formal planning procedures consist of three elements: Information to be considered in the procedure, the discussion process, and the decision-making process (see Figure 7).

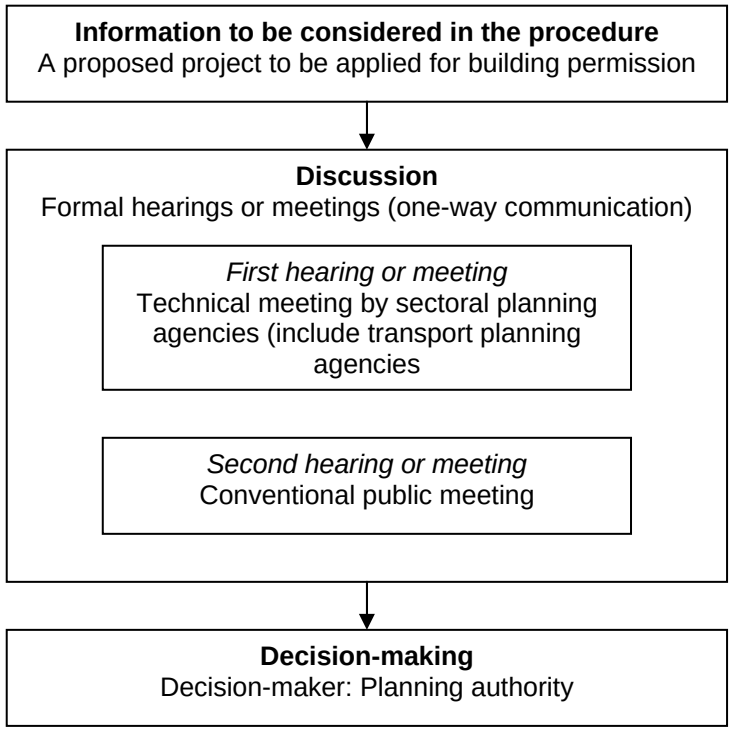


Figure 7: Formal Planning Procedure

Information to be considered in a formal planning procedure can be relative to the proposed project alone. Practically, formal planning procedures are not able to consider a project's alternatives. Therefore, the information to be considered always expresses the requirements of the project's owners or developers alone. Requirements of other stakeholders were not included in the design of the project.

The discussion process in a formal planning procedure is based on the one-way communication principle. The conventional discussion method for formal planning procedures, so-called meetings or hearings, was most commonly adopted (Amy, 1987). The first discussion of formal planning procedures is a technical hearing or meeting. At this first meeting, representatives of planning authorities, who are likely to be affected by the proposed project, are invited to share their opinions. The second discussion is a public hearing or meeting,

which allows other stakeholders to present their point of view on the proposed project.

A responsible planning authority is the sole decision-maker in a formal planning procedure. The planning authority considers whether or not the proposed plan conforms to planning laws and building regulations. If yes, the building permit will be granted. Other stakeholders do not have a chance to participate in the decision-making process. Opinions of other stakeholders, obtained from both hearings, may or may not affect the authority's decision-making. With the granted building permit, project owners can build their projects. After decision-making, if the other stakeholders do not agree with the decision, the only way the stakeholders can protest against the granted projects is by filing a lawsuit.

Based on the limitations of legislative concepts, binding land-use plans and building regulations could designate only upper or lower limits and general rules of subjects related to public health, safety, and welfare. Practically, binding land-use plans and building regulations could not take rights and freedom away from the people without plausible reasons and appropriate compensation. However, the static and rigid character of land-use and building regulations alone were not able to deal with dynamic land-use and transport changes, especially in airport regions, in creating high-quality living communities.

2.2.3. Informal Planning Procedures

An informal procedure is prepared in advance of a formal one; the informal procedure also confirms the content in substantive terms. Many aspects of daily life are not formally regulated and yet are extremely important. Thus, there was no difference relative to the context of land-use and transport planning. Informal planning could not create building rights. However, in a number of areas, such as urban land-use planning, redevelopment and development, and in deliberations on the approval of development projects, the informal planning adopted by a municipality might be drawn on within the formal decision-making process for help. An informal planning procedure must be in the co-operative formation – **Direct Negotiation**, **Facilitation**, or **Mediation**. This could happen, for example, in order (Federal Ministry of Regional Planning, Building and Urban Development, 1993):

- to establish the aims and purposes being pursued by an urban development or redevelopment measure
- to assess the progress of planning on urban land-use plans still in the process of preparation

- to examine the justification and integration of a plan for development projects and infrastructure in connection with giving consent for development within unplanned built-up areas
- to grant dispensations
- to waive certain formal procedural stages during which informal planning had been discussed with those affected

Generally, informal planning procedures consist of three elements: Information to be considered in the procedure, the discussion process, and the decision-making process (see Figure 8).

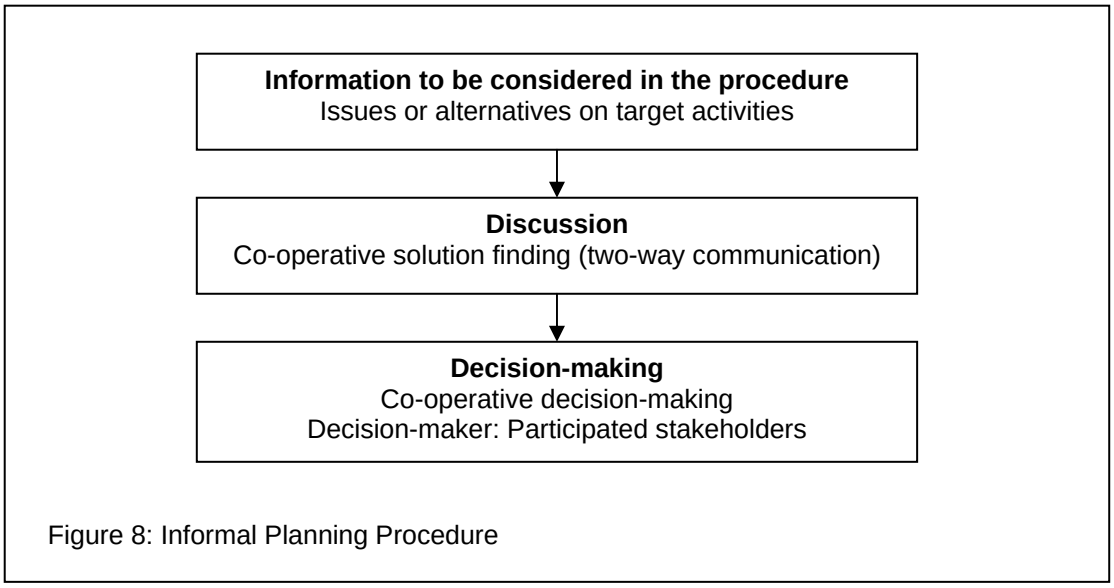


Figure 8: Informal Planning Procedure

Unlike a formal planning procedure, an informal procedure can begin with issues about the target activities (e.g. the *Mediationsverfahren* of the fourth runway project at the Frankfurt Airport started with an issue about the capacity of the airport). An informal planning procedure is able to consider and analyse the alternatives related to the issue.

The discussion process in an informal planning procedure is based on the co-operative two-way communication principle. Stakeholders of the selected issue are invited or allowed to participate in the discussion group, or so-called planning forum. In some formations, facilitation and mediation, third parities are also invited or hired to help in technical aspects or even reaching agreements among the stakeholders.

With a co-operative decision-making process, all stakeholders have a chance to help make the decision. Results from an informal procedure, which contain the recommendations and guidelines on the target issue, will be submitted to the responsible formal planning authorities. The information obtained by

processing an informal planning procedure is usually considered as crucial input for a formal planning procedure.

2.2.4. Interrelations of Formal and Informal Planning Procedures

A formal procedure must exactly conform to the planning regulations. The type of results from a formal procedure is fixed by the prescribed regulations. There is a rigid regulation for selecting the participants in a formal procedure. On the other hand, it is flexible in the selection of an appropriate formation of an informal procedure. Types of results are constructible, and the structure of an informal procedure can be freely set. Scholl (2005, online) also pointed out that formal and informal procedures should work together to create effective results. He recommended that formal procedures should be simplified, and government controls on formal procedures should be reduced. Furthermore, appropriate knowledge is required to process an efficient informal procedure (see Table 1).

Planning Element	Informal Procedure	Formal Procedure
Formation of a procedure	The formation can be freely selected	The formation must conform to the prescribed rules i.e. Land-Use Planning Procedure Legally-Binding Planning Procedure
Types of results	Types of results can be constructible	Type of results is fixed by the regulations i.e. Plan Notation Regulation (*Planzeichenverordnung*)
Organisation's structure	Organisation's structure can be freely set	Organisation's structure must follow the prescribed rules for selecting participants

Table 1: Comparison of formal and informal procedures (Scholl, 2005 online)

2.3. Applications in Airport Regions

2.3.1. General Information

Integrated planning of land-use and transport conceptually aims at creating efficient co-ordination and co-operation of policies, planning methods, and instruments. The planning procedure could be expedited and enhanced by identification of all relevant stakeholders and, through their active participation, better outcomes would result. Thus, some stakeholders should come from different planning fields under a comprehensive planning process. However, because of the specialities of airport regions, airports' performances, one of which is "airport accessibility", has to be maintained at a high level of quality in addition to the general goals of other regions. In order to maintain high-quality performance relative to airport accessibility, procedures for integrated planning of land-use and transport in airport regions

were introduced. In this chapter, the goals, objectives, and requirements of these procedures were designed as a framework for further study.

2.3.2. Addressed Projects

Similar to other regions, airport regions contain various uses of land, with different activities and requirements for land-use and transport infrastructures. Nevertheless, because airports are key economic stimulators from regional to international contexts, it was also necessary to maintain the performance of airports at high-quality levels. However, not all types of land-use projects created the same degree of need relative to planning procedures. In this chapter, land-use project types were classified into three groups by degrees of need for procedures for integrated planning of land-use and transport in airport regions.

Areas in airport regions

Airport regions were divided into three main areas of three airport regions in this study as illustrated in Figure 9.

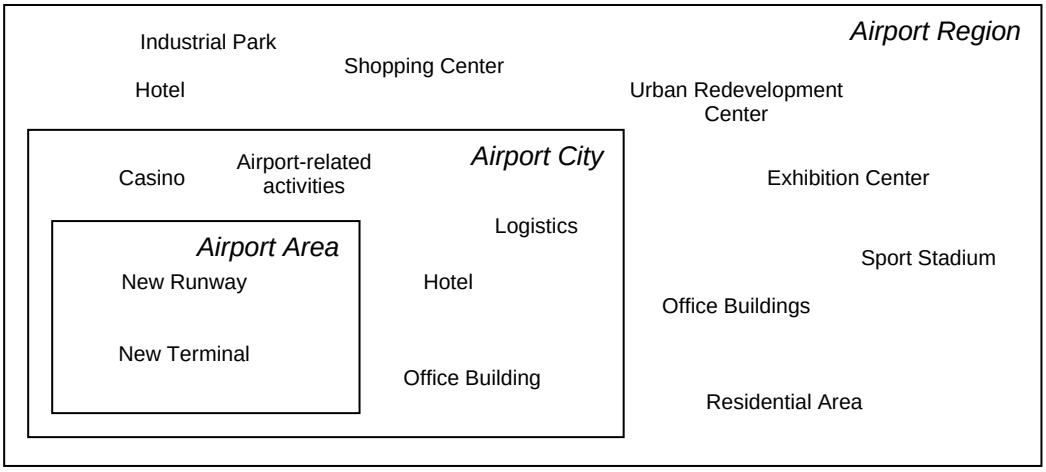


Figure 9: Areas and Projects in Airport Regions

Airport Area is an area containing an airport. *Airport City* is the more or less dense cluster of operational, airport-related as well as other commercial and business activities on and around the airport (however, this cluster is called an Airport City only if it shows the qualitative features of a city: density, access quality, environment, service, etc.). *Airport Region* is a region containing an airport. These three different areas created different impacts on land-use and transport, and also contained different classifications of project types.

Definition of projects in airport regions

In this study, the term “projects in airport regions” represented large public projects and their related binding activities which already have been or are to

be planned with considerable impact on land use, economy, society, and environment of airport regions. In the context of the interrelation of land-use and transport, different projects contributed different impacts on airport accessibility and, consequently, demanded different degrees of need for procedures for integrated planning. Large public projects with high impact on airport accessibility required efficient procedures for integrating them into regional transport system. Some of these projects were conducted by both formal and informal procedures.

Criteria for classifying project types in airport regions

There are wide ranges of criteria for classifying project types in airport regions. In this study, the basic idea was that selected criteria should conform to the perspectives of integrated planning of land-use and transport in airport regions. Classification was established from a combination of land-use's and transport's aspects. In addition, the classification method came from a combination of quantitative and qualitative aspects. One criterion from each planning field was selected. The criterion of "*traffic volume generated by a particular project*" was considered as a representation of the transport side as well as a quantitative measure. For land-use and its qualitative side, "*impact on airport accessibility*" was applied as another criterion.

The criterion "*Traffic volume generated by a particular project*" was selected because each project has its own characteristics relative to generating traffic volume. Generated traffic volume depends on the numbers of workers, amount of resources for production, amount of products produced by the project, numbers of clients, suppliers, and visitors who had direct contact with the projects, etc. However, if the absolute numbers of the criteria stated above were used as indicators, an overly long discussion would be needed. In this study, a reliable reference such as the lists of projects in "Guidance on EIA" (Environmental Resources Management, 2001), was selected as an indicator for classifying projects by their degrees of need for procedures relative to integrated planning.

- *High traffic volume generated projects* were projects that must be subject to EIA. Examples are construction of lines for long-distance railway traffic and of airports with a basic runway length of 2,100 meters or more and the construction of motorways or express roads.
- *Medium-High traffic volume generated projects* were projects that must be subject to EIA if they were likely to have significant effects on the environment. Examples are industrial estate development projects, urban development projects, tramways, elevated and underground railways.

- *Medium traffic volume generated projects* were all public projects that were not considered as high and medium-high traffic volume generated projects. Examples are hotels, hospitals, and office buildings.
- *Low traffic volume generated projects* were all private projects that were not considered as high, medium-high, or medium traffic volume generated projects.

The second criterion was "*Impact on airport accessibility*". Every project generated people's needs to participate in its activities. It led to additional trips or changes in travel behaviour. Routes and modes of transport people chose created impacts on a regional transport system, and, consequently, on airport accessibility. There are two elements for assessing impact on accessibility; (1) available routes and modes of transport for participating in a project's activities, and (2) cost and time for users based on the selected routes and modes. According to these two elements, three questions were designated as the indicators;

- Could the same routes and modes to the airport reach the project?
- Could the project be accessed by alternative routes and modes?
- How much cost and time for users on alternative routes and modes compared to those with direct access to the airport?

By answering the three criteria questions, an indicator was composed as shown in Table 2:

Could the same routes and modes to the airport reach the project?	Could the project be accessed by alternative routes and modes?	Cost/time for users on alternative routes and modes compared to those with direct access to the airport	**Impact on airport accessibility**
Yes	No	N/A	**High**
Yes	Yes	Higher	**High**
Yes	Yes	Similar	**Medium**
Yes	Yes	Lower	**Low or None**
No	Yes	N/A	**Low or None**

Table 2: Indicators for impact on airport accessibility

Classification of project types

Based on the two selected criteria above, a combination of them was applied in order to sort the projects into three different groups for further investigation. A two-axis graph was selected as a "tool" to define the degree of need of each

group. The vertical axis represents the criterion of “traffic volume generated by particular project” with a range from low to high. The horizontal axis represents the degree of “impact on airport accessibility” with the same range as the vertical axis. Two diagonal lines were superimposed to divide the area into three sectors with different degrees of need (low, medium, and high) for procedures for integrated planning of land-use and transport. Figure 10 illustrates the graph containing paired data points for the two criteria and delineates the sectors to be investigated.

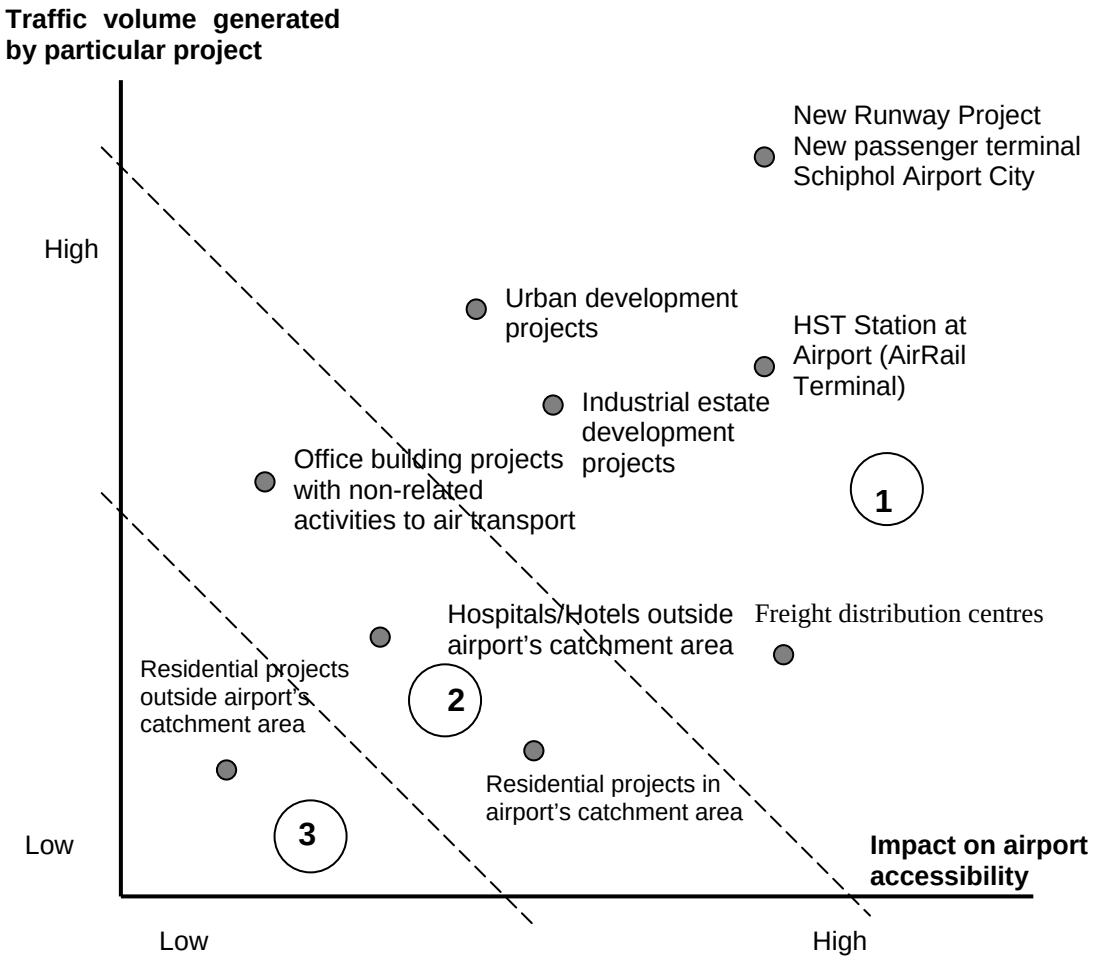


Figure 10: Need for procedures for integrated planning of land-use and transport from the viewpoint of airports

- *Sector 1*: This sector contains projects which either generated medium-high to high traffic volume or created medium-high to high impact on airport accessibility. For example, new runway projects, new passenger terminal projects, an airport city, urban development projects, HST (High Speed Train) station at the airport, freight distribution centres, and industrial estate development projects.

- *Sector 2*: This sector contains projects which generated either medium traffic volume or medium impact on airport accessibility, but excluded projects which were included in sector 1. Examples of projects in this sector are: public projects outside of the catchment's area of an airport, office building projects with activities not related to air transport, and residential projects within an airport catchment's area.

- *Sector 3*: This sector contains projects which generated low traffic volume and had low impact on airport accessibility; for example, housing projects outside of an airport catchment's area.

Level of traffic volume generated by a particular project	Level of impact on the accessibility of airports	**Level of need for procedures of integrated planning**	Example projects
High	High	**High**	New runways New terminal buildings Airport city
High	Medium	**High**	HST-stations at the airport
High	Low	**High**	Urban development projects
Medium	High	**High**	Industrial estate development projects
Medium	Medium	**Medium**	Hospitals or hotels outside airport catchment's area
Medium	Low	**Medium**	Office building projects with unrelated activities to airports
Low	High	**High**	Freight distribution centres
Low	Medium	**Medium**	Residential projects in airport catchment's area
Low	Low	**Low**	Small residential projects outside airport catchment's area

Table 3: Need for integrated procedures from the viewpoints of airports

From Figure 10, it might be concluded that projects in sector 1, with either high traffic volume or high impact on airport accessibility, were projects with high need for procedures for integrated planning of land-use and transport.

Projects in sector 1 required both formal and informal procedures in order to enable efficient integration of land-use and transport in airport regions. Projects in sector 2, with either medium traffic volume or medium impact on airport accessibility and which excluded projects in sector 1, were projects with medium need for integrated procedures for integrated planning. Projects in sector 2 required at least formal procedures for integrated planning of land-use and transport. Informal procedures should be applied later if efficient integration could not be accomplished by formal procedures alone. Lastly, projects with low traffic volume and low impact on airport accessibility in sector 3 were projects with low need for procedures for integrated planning. For these types of projects, formal procedures prescribed in planning regulations alone should be able to create integration of land-use and transport. This classification would be more clearly understandable when presented in tabular form as follows:

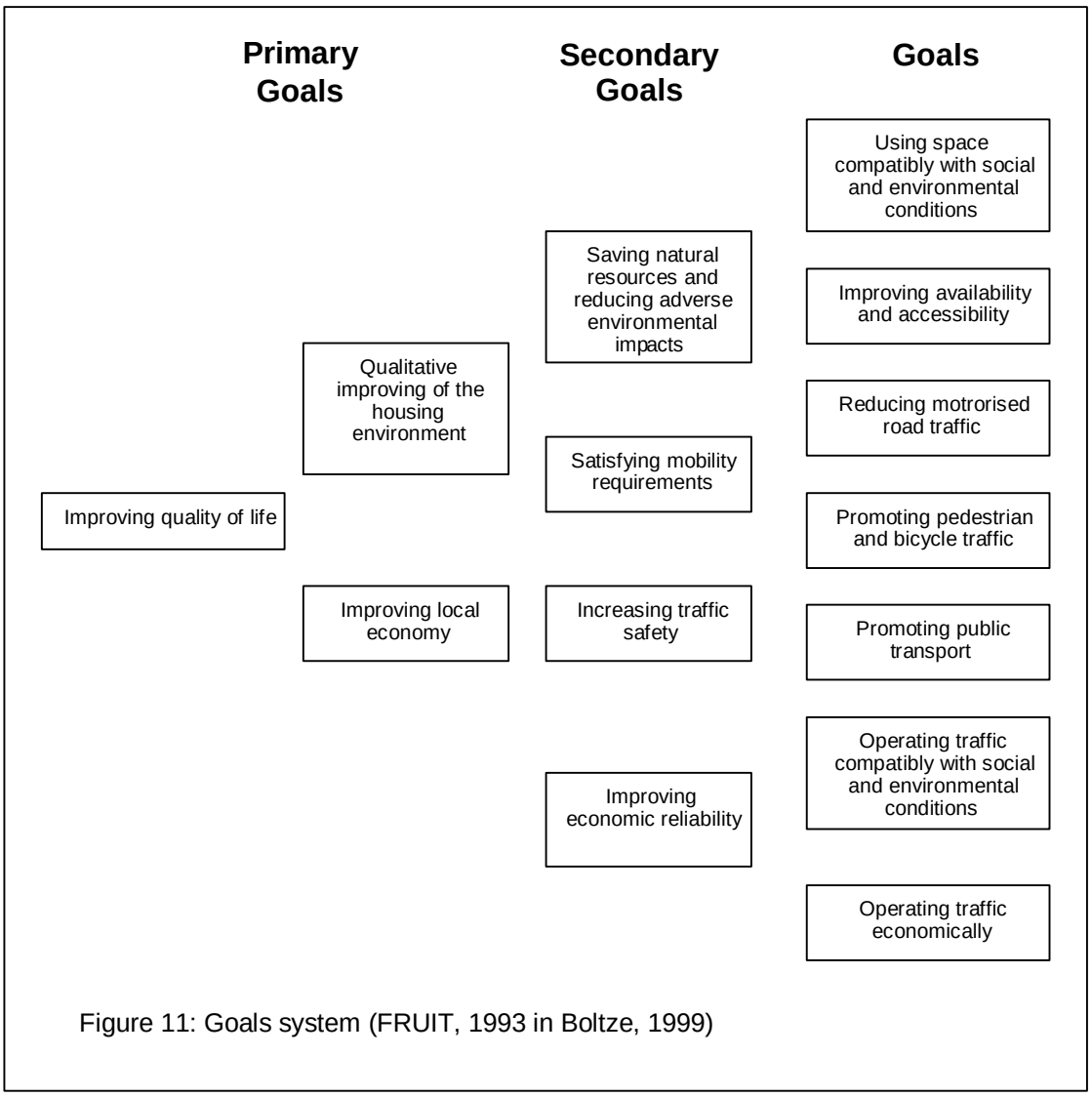


Figure 11: Goals system (FRUIT, 1993 in Boltze, 1999)

In this study, projects in sector 1, projects that required both formal and informal procedures for integrated planning of land-use and transport in airport regions, were mainly focused on for further investigation. Projects in sectors 2 and 3 might have been considered if they created substantial impact on the quality of airport accessibility.

2.3.3. Goals of Projects in Airport Regions

The general transport-related goals of every land-use and transport development project are shown in Figure 11[4]. However, due to the specialities of airport regions, the performance of an airport is one of the important influences behind every goal. According to the interrelation of land-use and transport in airport regions, every land-use change or development affected airport accessibility and thus was an indicator for determining an airport's performance. Procedures for integrated planning of land-use and transport are crucial tools used to guarantee efficient accessibility of an airport and, eventually, to achieve every goal stated in its goals system.

2.3.4. Goals, Objectives, and Requirements of Planning Procedures for Integrated Planning of Land-use and Transport

Procedures for integrated planning are aimed at creating efficient co-ordination and co-operation regarding policies, planning methods and instruments, and stakeholders from different planning sectors under comprehensive planning. In the context of land-use and transport planning, it was accepted that every land-use change or development affected the accessibility. Formal procedure alone was not able to guarantee accessibility and to avoid conflicts among stakeholders which might destroy the economic, social, and environment conditions of the whole area. Therefore, projects need appropriate planning procedures with the goal of "*efficient integration of land-use and transport*". To achieve this goal, three objectives were designated:

- *to enable high-quality results*. Procedures should be able to ensure accessibility to the projects themselves and the whole area. All relevant inputs should be considered with appropriate procedures. Then, the results should gain acceptance by all stakeholders.
- *to avoid conflicts among stakeholders*. Procedures should be able to eliminate, or at least mitigate, conflicts among stakeholders of land-use and transport planning by bringing the conflicts of interest to a balanced situation. Stakeholders should be able to openly participate in the procedures. The procedures should be fairly and understandably

[4] in Boltze, 1999

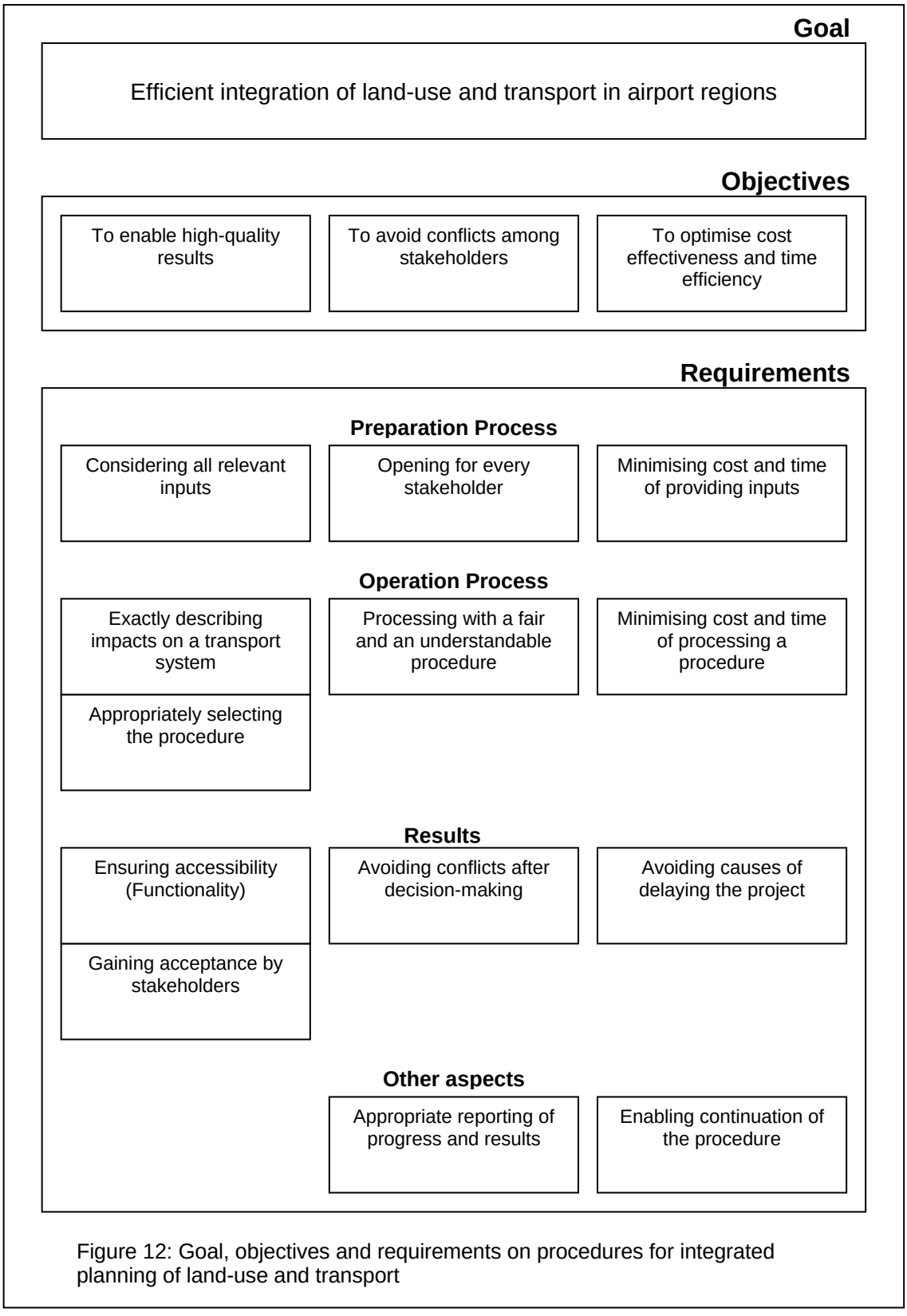


Figure 12: Goal, objectives and requirements on procedures for integrated planning of land-use and transport

processed. The proceedings and results of the procedures should be appropriately documented.

- *to optimise cost effectiveness and time efficiency*. Procedures should be able to be processed with appropriate amounts of cost and time. Causes

of delaying the projects should be eliminated. The procedure should be continuously enabled.

Normally, a metropolitan region is composed of a number of city centres. The presence of an international airport made an airport region different from the general metropolitan regions. Efficient international linkages created by an airport drew the attentions of international companies and air transport related activities to be located there. These activities created a large number of jobs, and, consequently, a substantial amount of revenue to the region. As a significant transport interchange node, an airport accompanied with the other modes of transport enabled the region to have a good connection to the other parts of the nation and continent. In the context of this study, planning in an airport region should be able to ensure both airport and regional accessibility. The procedure should be able to proceed with appropriate amounts of cost and time being spent.

From these three objectives, four sets of requirements – in order to achieve each objective – were established by following a framework for processing procedures; inputs, operation process, results, and other aspects (see Figure 12).

Specific requirements of procedures for integrated planning of land-use and transport were the basis for assessment of the efficiency of available procedures as contained in chapter 4.

3. Selection of Case Studies

3.1. Introduction

This part of the study deals with the investigation of airport regions, case studies, planning systems, and the outcomes of their implemented procedures. It consists of sub-chapters that explained the situation of each case study in aspects relevant to the integrated planning of land-use and transport.

Chapter 3.2, “Selected Airport Regions and Projects” describes the criteria for selecting airport regions and projects in each region. Available projects in each region are also explained.

Chapter 3.3, “Basic Information of the Planning Systems” contains basic descriptions about planning systems in three different countries. Planning levels, related laws, and regulations in each country are also explained.

Chapter 3.4, “Case Study Descriptions” provides an overview of planning on each project. The implemented formal and informal procedures of each case study are also presented.

Chapter 3.5, “Case Study Analysis” describes the results from the investigations. The results are considered as crucial information for assessing the efficiencies of the implemented formal and informal procedures in the next chapter.

3.2. Selected Airport Regions and Projects

In the North Western European Region, there are several international airports. Activities at those airports, and their induced activities, created the substantial impacts on a nation’s spatial, economic, and social situations. By these effects, a large number of land-use development projects have been created.

3.2.1. Selection of Airport Regions

Additional or changed trips created by every project in airport regions affected airport accessibility. Most major land development projects in airport regions were located at the airport itself or near a major city where the airport and city were highly interrelated. Therefore, the criterion for selecting airport regions, which were investigated in this study, was the distance between the airport and its major city. Güller Güller architecture urbanism (2001) investigated the distance between an airport and its major city which is illustrated in Figure 13.

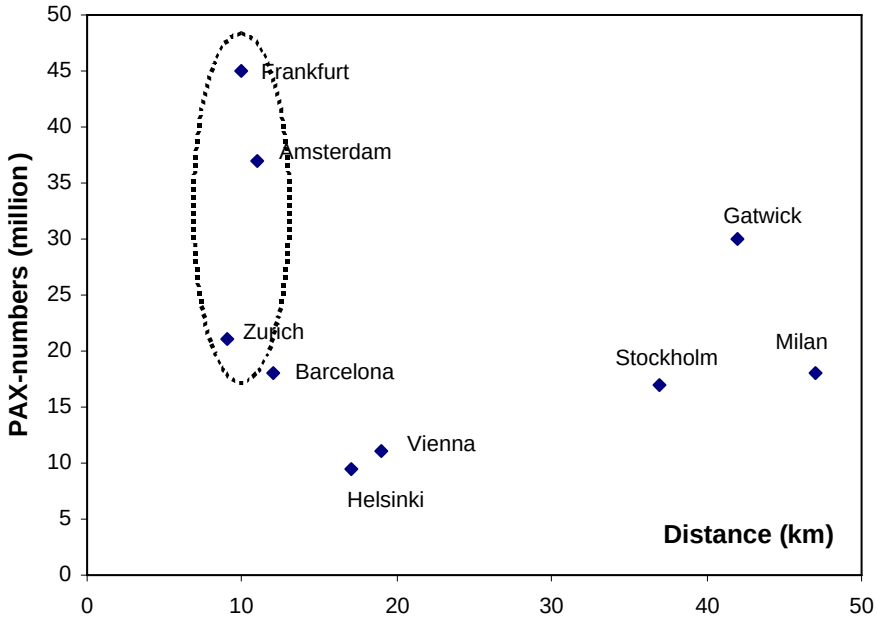


Figure 13: Distance from airports to city centers (Güller Güller architecture urbanism, 2001)

Figure 13 shows that three major airports, Amsterdam, Frankfurt, and Zurich, are located closest to their major cities. Therefore, these three airports were selected for further investigation. Furthermore, the “Airport Planning Seminar”, started in 2001, provided a discussion forum for planning issues in these three airport regions. Every year, experts in related planning sectors were invited to present and discuss airport planning topics. Since the Department of Transport Planning and Traffic Engineering of TU-Darmstadt is a co-founder of this seminar, good connections to these three airport regions have been established.

3.2.2. Selection of Projects

The three selected airport regions were Amsterdam, Frankfurt, and Zurich. In each selected airport region, projects were classified into three groups following the three different areas indicated in chapter 2.3.3.

Examples of projects in airport areas are new runways and new terminal buildings, which are considered as key measures for increasing an airport’s capacity. An Airport City area contains air transport related projects, e.g. logistics, trade port, airport hotel, commercial and office buildings, which were attracted by the advantages of being located at the interchange of several transport modes. Projects in airport regions represented large public building proposals in metropolitan regions which were attracted by the presence of international airports.

Criteria for selecting case studies

In order to select projects to be used as case studies, three criteria were formulated as follows:

Criterion 1: One case study from each of three areas

In this study, each airport region was divided into three areas: Airport Area, Airport City, and Airport Region. Each selected case study should be an appropriate example for each area from each airport region.

Criterion 2: Case studies should have substantial significance for integration of land-use and transport in airport regions

The selected case studies should require a high need for integrated planning of land-use and transport. Therefore, they should generate high traffic volume and should create high impact on airport accessibility (see chapter 2.3.1).

Criterion 3: Informal Procedures for integrated planning should already be applied in selected case studies (if available)

The selected case study should have been already processed by means of informal procedures for integrated planning of land-use and transport. It could be implied that formal procedures alone might not be able to complete the goal, objectives, and requirements on the integrated planning of land-use and transport system. Therefore, these projects required the use of informal procedures for fulfilling what was missing by the processing of only formal procedures.

Based on the three criteria stated above, the selected case studies were:

Area	Amsterdam	Frankfurt	Zurich
Airport Area	5th Runway Project	4th Runway Project	5th Expansion Project
Airport City	Not Available	AirRail Terminal – Business Centre with 170,000 m^2 hotels, commerce, offices, and medical care centre	Butzenbühl Area – with 120,000 m^2 offices and casino (Cancelled by economic reasons)
Airport Region	Amsterdam Zuid-As – with 1,200,000 m^2 offices, 6,000 companies, 160,000 m^2 commerce and entertainment	Europa-Viertel – with offices, residential, and entertainment centre	Zentrum Zürich Nord Urban Development – with 71 Ha. Hotels, fairground, stadium

Table 4: Selected case studies from each airport region

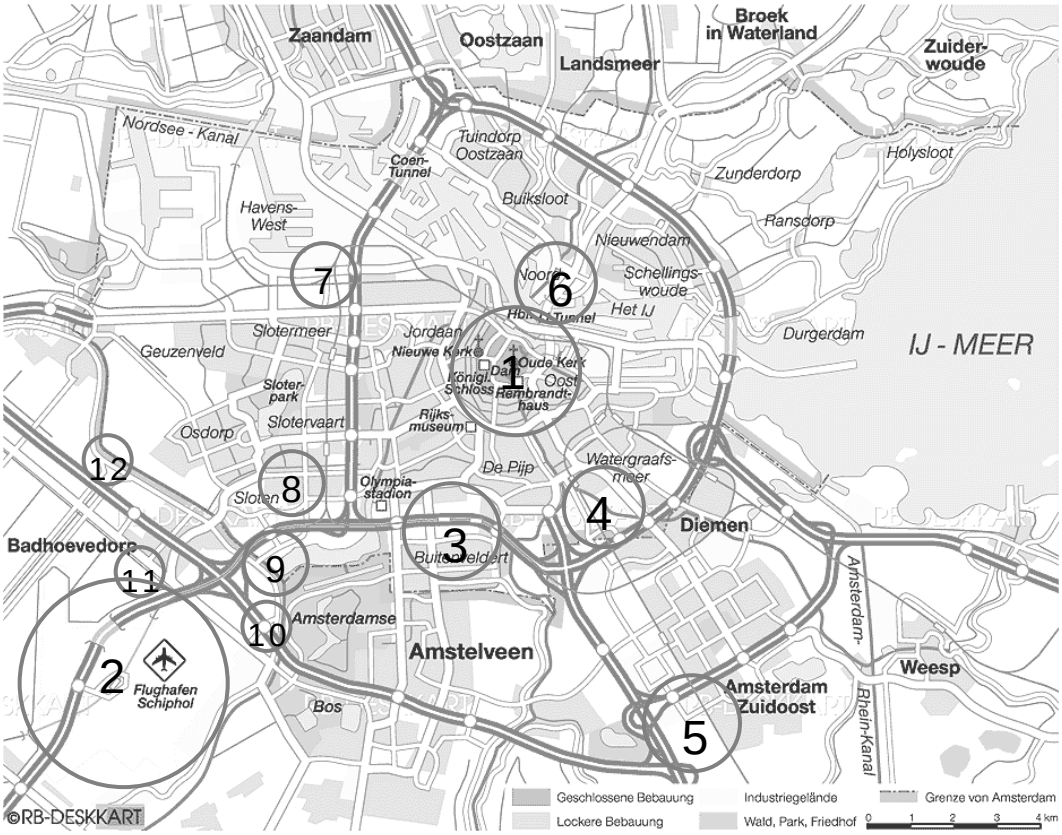
Unfortunately, two case studies in certain Airport City areas had to be eliminated from this study. Projects in the Amsterdam Airport City were approved under a different planning procedure. Amsterdam used informal procedures for the land-use planning stage (overall area of Amsterdam Airport City), not project-by-project. Projects in the Butzenbühl Area in Zurich were cancelled because of financial problems after an international design contest. Therefore, there were seven case studies available for use in this study.

Selected Projects in Amsterdam

The Amsterdam Airport is at the core of the Netherlands's national strategy as defined in the fourth report on regional planning and development (1988), and it aimed at supporting the international distribution function of the Netherlands and at tapping into the flows of globalisation. The market share held by the Netherlands in European headquarters' locations is 20%, half of which are located in a sector of an airport. For European distribution centres, this figure is 50%, a third of which are located in a sector of the airport. There are 1,400 foreign companies in the Greater Amsterdam Area, 35% of which are Americans, and 15% of which are Japanese. Currently, about a half of the foreign companies who located in Amsterdam are American, many of whom are companies from the information and communications technology sector (Berthon / Bringand, 2001).

The recently concluded evaluation of the expansion of airport capacity in the Netherlands has results in the decision to accommodate further growth at Schiphol itself. The alternative, to relocate the entire airport to an island some thirty kilometres form the coast, was judged as too expensive and a long term option only. This means that Schiphol Airport must optimise airport capacity at the current location within given noise contours. After the completion of the fifth runway (scheduled for 2003), a new configuration of the runways might be necessary in order to expand capacity. Schiphol is a participant in the development of an "Underground Logistic System" (ULC), a fully automated rail-shuttle, which will connect the world's largest flower fair in Aalsmeer via the airport's cargo-cities (South-East and Centrum), to a new cargo rail terminal for high speed cargo shuttle trains in Hoofddorp.

Schiphol has created Schiphol Real Estate BV (SRE) to operate a major urban territory (2,400 ha). SRE is promoting the transformation of a remote site (Elzenhof) and the former hangars/Fokker industries (Schiphol Oost) into airport business parks. It is building up a major international business centre "Amsterdam Airport City" in the core of the airport, right next to the railway interchange.



1. Amsterdam City Centre
2. Amsterdam Airport Schiphol
3. Amsterdam Zuid-As
4. Amsterdam Amstel III
5. Amsterdam Zuid-Oost
6. IJ Oevers
7. Amsterdam Teleport
8. International Business Park Riekerpolder
9. Oude Haagse Weg
10. Schiphol East
11. Sky Park
12. Lijnden/Lutkemeer

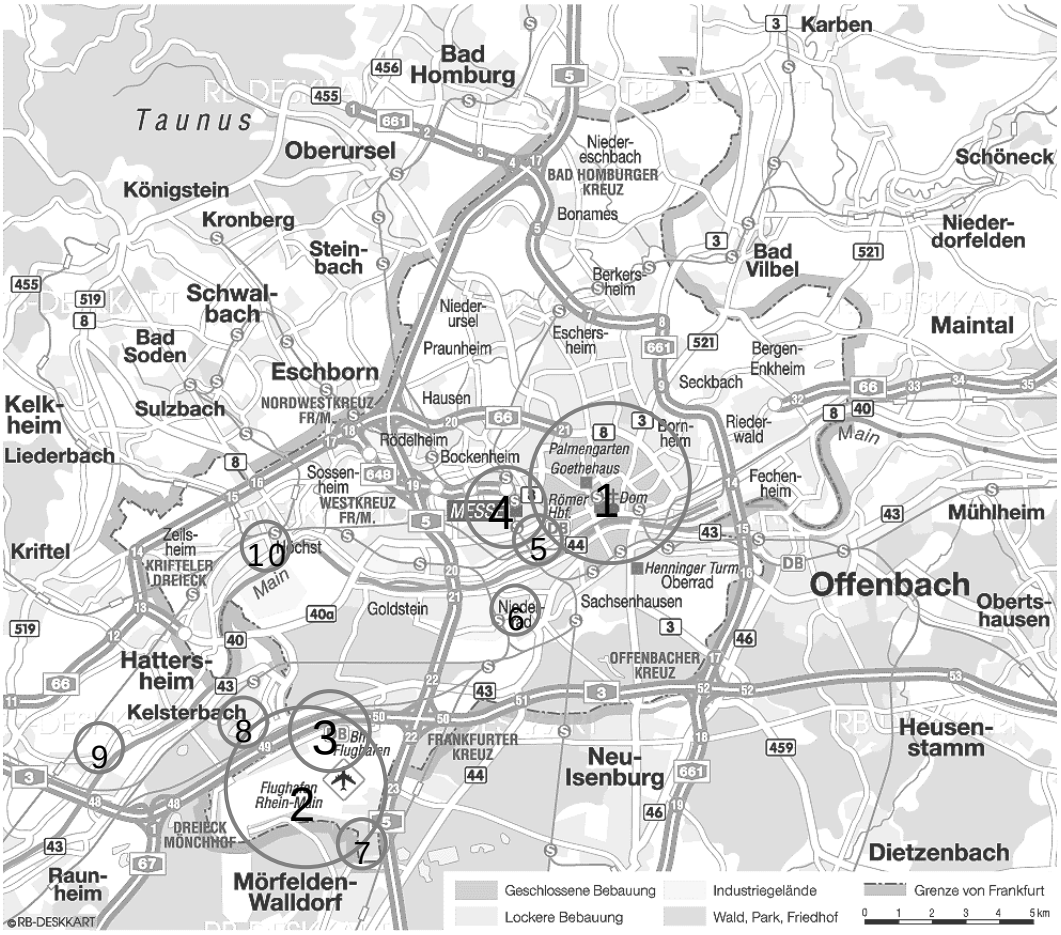
Figure 14: Areas and projects in Amsterdam Region

The City of Amsterdam is developing the redevelopment plan of the IJ-oevers, the northern waterfront around the Central Station. The project “Amsterdam Zuid-As” is also developing on the city’s southern periphery, a few kilometres north of the airport. The Province of North-Holland sees the Zuid-As and the airport as one development zone. This corridor, so-called as the “Cash-corridor”, has the assets of an airport, future High Speed Train stations, an international business location, and abundant housing potential for Amsterdam (Güller Güller architecture urbanism, 2001).

Selected Projects in Frankfurt

The Rhein-Main Region has a polycentric spatial structure. Beside Frankfurt, cities like Darmstadt, Hanau, Mainz, and Wiesbaden are also important multi-

functional centres for the region. The city of Frankfurt is a high potential location for international business. The presence of a top international airport, like Frankfurt Airport, provided high competitive advantages to the region (Berthon / Bringand, 2001).



1. Frankfurt City Centre
2. Frankfurt Airport
3. AirRail Center Frankfurt
4. Europa - Viertel
5. Frankfurt Main Railway Station
6. Office Park Niederrad
7. Walldorf Industrial Area
8. Trade Port Kelsterbach
9. Caltex Refinery
10. Hoechst Industry

Figure 15: Areas and projects in Frankfurt Region

Frankfurt airport is surrounded by the city's forest, a well-guarded green belt. Expansion of the airport area is only discussable for operational purposes. On the airport platform itself, nearly all areas are used for aviation activities. But there are more sites, e.g. the former American air base and the related housing area "Gateway Gardens", which will soon be returned to the airport

operator. They will be used to expand the operation areas, the new “Cargo City South”, and commercial functions.

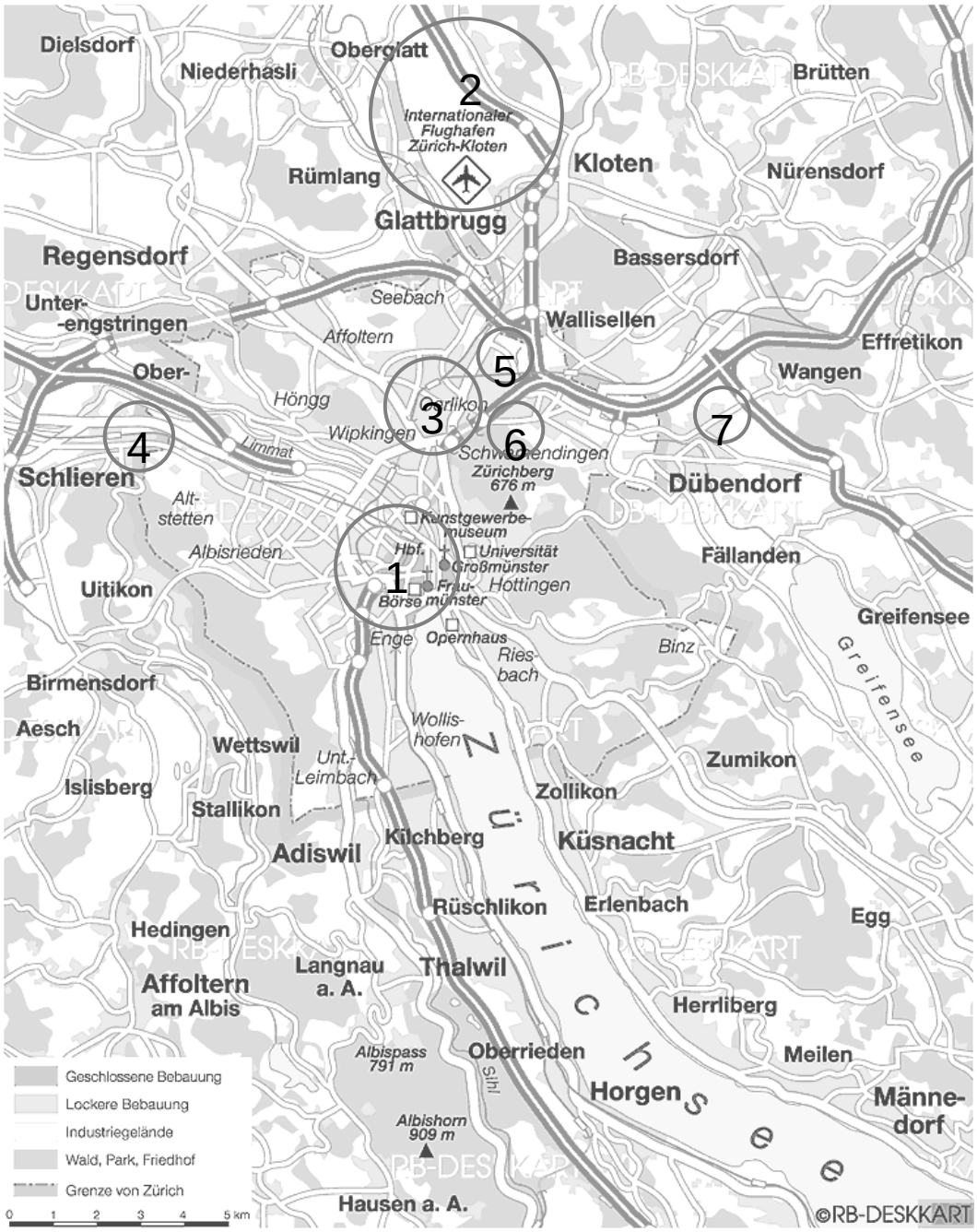
Since downtown Frankfurt is the top location for international business, the “Banking District” is the region’s major international asset. The airport is to serve this asset in the first place. Travel times between the city centre and the airport are quite short by road and by train. In the airport city area, Frankfurt Airport accommodates the biggest European airport conference centre (mostly part of Sheraton Hotel), offers 170,000 m^2 of business and retail space on top of the AirRail terminal, and is planning the construction of the new headquarters of Lufthansa. Furthermore, the City of Frankfurt tries to channel investment into its own enormous redevelopment areas in the inner city: the Messe (fairgrounds), Europa-Viertel, and Frankfurt 21, the planned restructuring of the Central Station area.

Also, the airport and its surroundings are continuously developing airport-related activities such as logistics, distribution, or high-tech production. The office park in Frankfurt-Niederrad, half way from Frankfurt City, has been in operation since the 1960s, and more recently the “Tradeport”, a logistic park just east of platform, has been opened up. There are also similar developments in the municipalities next to the airport and on larger ex-industrial sites, such as the former Caltex refinery or the former Höchst-production plant (Güller Güller architecture urbanism, 2001).

Selected Projects in Zurich

The Greater Zurich Area is the economic driving force of Switzerland and is already home to some of the most successful international companies, e.g. DOW Chemical, General Electric, General Motors, IBM, Lehman Brothers, Merck, and Pfizer. The Greater Zurich Area covers a region about one-third the size of the whole of Switzerland, and is home to 45% of its inhabitants (3.2 million). Its workforce of 1.6 million is employed in approximately 140,000 companies, producing aggregate national income totalling CHF 170 billion.

The Glattal Corridor is considered as the hottest spot for development in Switzerland. It contains a bundle of high-quality national, regional, and local transport infrastructures, and no less than three important public transport interchanges only ten minutes apart: Zurich Central Station is the Swiss railway hub; the airport is Switzerland’s 5^{th} most used station, and Oerlikon is an important regional hub. All of them lie between sites with excellent development potential and have been designated “Regional Center Areas” in the Canton’s Structure Plan.



1. Zurich City Centre
2. Zurich Airport
3. Zentrum Zurich Nord
4. Zurich West Redevelopment
5. Cher
6. Oberhauserriet
7. Hochbord Duebendorf

Figure 16: Areas and projects in Zurich Region

The “Regional Center Areas” concept originally encompassed eleven areas throughout the Canton, which together form a vital polycentric structure that allows for an economically and ecologically sound operation of the regional

railway. The quality of public transport is perceived as one of the most important elements of the overall regional investment climate. In recent years, the focus has shifted away from the initial eleven to the five best integrated and co-ordinated locations. These are the airport (the fifth expansion project) and Zurich Central Station developments, as well as the areas with the highest potential to undergo major transformations through redevelopment: Zentrum Zürich Nord, Zurich West, and Winterthur industrial districts (Güller Güller architecture urbanism, 2001)

3.3. Basic Information of the Planning Systems

Planning systems are regulated by planning laws at different planning levels. Planning laws indicate instruments for planning. Generally, planning in a nation is categorised into national, regional, and local levels. In some nations, e.g. Germany, some large regions are divided into sub-regions for effective governmental management.

3.3.1. The Netherlands

Spatial Planning in the Netherlands is regulated by the Spatial Planning Act (*Wet op de Ruimtelijke Ordening*, revised 1999). Decisions in the field of spatial planning were taken by the major institution with executive powers at each of the three levels of government:

- At the national level by Parliament (First and Second Chambers or *De Staten-General*) and central government (*de regering*);
- At the provincial level by the Provincial Council (*Provinciale Staten*) and Provincial Executive (*Gedeputeerde Staten*);
- At the local level by the Municipal Council (*Gemeenteraad*) and the Municipal Executive (*College van Burgemeester en Wethouders*)

This administrative decision-making process is supported by a number of official bodies that exist specifically for spatial planning:

- At the national level, these are the National Spatial Planning Commission (*Rijksplanologische Commissie*), the National Spatial Planning Agency (*Rijksplanologische Dienst*), and the Advisory Council for Spatial Planning (*Raad voor de Ruimtelijke Ordening*);
- At the provincial level, these are the Provincial Spatial Planning Commission (*Provinciale Planologische Commissie*) and the Provincial Spatial Planning Agency (*Provinciale Planologische Dienst*);
- At the local level, the Municipal Spatial Planning Department (*Dienst Ruimtelijke Ordening*)

To achieve spatial planning objectives, the Spatial Planning Act provided the official bodies involved with a large number of specific spatial planning instruments. These instruments can be divided into two categories:

Those in the first category, plans and policy documents, enabled the administrative bodies at the three levels of government to carry out spatial planning in a form that was both tangible and open to discussion. At the national level, these instruments were the national spatial planning policy document (*nota over de ruimtelijke ordening*) and the national structure plan for a specific policy sector (*structuurschema*); at the provincial level, the regional spatial plan (*streekplan*); and at the local level, the structure plan (*structuurplan*) and local land use plan (*bestemmingsplan*).

Government Organisation	Legal Basis	Governing Body	Instrument
Nation	Spatial Planning Act	o Parliament (First and Second Chambers) o The Crown o Council of Ministers o National Spatial Planning Commission o Advisory Council for Spatial Planning o National Spatial Planning Agency	o National Spatial Planning Policy Document o National Structure Plan for Policy Sector o National Spatial Planning Key Decision
Province		o Provincial Council and Provincial Executive o Provincial Spatial Planning Commission o Provincial Spatial Planning Agency	Regional Plan
Local		o Municipal Council and Provincial Executive o Municipal Spatial Planning Department	o Structure Plan o Local land use plan o Preliminary decree o Active land policy o Land development and provision of local infrastructure o Compulsory purchase o Pre-emption rights o Recouping servicing and infrastructure costs o Public-private partnerships
Project	Spatial Planning Act and Housing Act	o Municipal Council and Provincial Executive o Municipal Spatial Planning Department	Building permit

Table 5: Planning system in the Netherlands (Ministry of Housing, Spatial Planning, and the Environment, 1998)

The instruments in the second category allowed spatial planning policy to be formulated at a particular government level and laid down in plans or policy documents to be implemented at the various other levels. At the national level, this category included directives (*afanwijzingen*) and exemption provisions (*uitzonderingsbepalingen*); at the provincial level, regulations and directives, approval of local land use plans (*goedkeuring bestemmingsplannen*); and, at

the municipal level, building and construction permits (*bouwvergenningen*, *aanlegvergunningen*) and exemptions (*uitzonderingsbepalingen*).

In the Netherlands, applications for development are made to the "*Gemeenteraad*" (municipal council). The decisions on applications are made by the municipal executive council, comprised of the Burgomaster and Aldermen, "*College van Burgemeester en Wethouders*" (Schmidt-Eichstaedt (Eds.), 1995).

A building permit could only be obtained if the proposed project complied with the local "*Bestemmingsplan*", which is a legally-binding land use "allocation" plan, which provided a detailed description of planned uses and the physical form of new development or redevelopment.

A municipality that was in favour of a development, which did not conform to its "*Bestemmingsplan*", could either exempt the proposal from the plan or adapt the plan. In both cases, approval of the provincial authorities ("*Provinciale Staten*") was required. The decisions relative to such cases were subject to public appeal and appeal by the independent national planning inspector.

For developments that complied with the "*Bestemmingsplan*", approval would be given if the project also conformed to the standards of the local "*Bouwverordening*" (municipal building regulations).

Projects that involved possible environmental pollution, e.g. chemical plants and projects beyond a certain size (such as airports or large recreational areas), should be submitted to an environmental impact procedure ("*Milieu Effect Rapportage*"), which established the effects of the project on the environment. This special procedure was stipulated in the General Rules of the Environmental Hygiene Act, and the results or recommendations were subsequently included in the local "*Bestemmingsplan*".

The Dutch planning system is based on the integration of all statutory plans within the three tiers of government: local, provincial, and central. All larger projects have to comply with the "*Bestemmingsplan*" (allocation or binding land use plan) and the "*Struktuurplan*" (structure or preparatory land use plan) for the area as well as the provincial/regional sector plans. But, the only legally binding plan is the "*Bestemmingsplan*", which was legally prescribed for undeveloped areas where new development was expected to take place, e.g. rural areas and urban renewal areas.

Where there was no "*Bestemmingsplan*" in a built-up area, a building permit could be obtained if the project fulfilled the conditions of the local "*Bouwverordening*" (municipal building regulations), unless the municipality had taken a preparatory decision announcing the preparation of a "*Bestemmingsplan*" within a year. This usually served the purpose of preventing undesirable development in an area. A building permit could be given in anticipation of the new plan. However, in this case, issuance of a permit was subject to provincial approval, open to public appeal, and appeal by the national planning inspector.

3.3.2. Germany

In Germany, the spatial planning system within a federally organized nation state is divided into three levels as follows and shown in Table 6 (Federal Ministry of Regional Planning, Building, and Urban Development, 1993):

a) Federal Authorities

The Federal Authorities comprise the Federal Government, including the Federal Ministries and various special offices, which are usually assigned to a specific ministry (e.g. the Environment Office or the Federal Statistics Office).

<table>
<tr><th>Government Organisation</th><th>Planning Level</th><th>Legal Basis</th><th colspan="2">Instrument</th><th>Content</th></tr>
<tr><td>Federal (Bund)</td><td>Federal Spatial Regulation</td><td>Spatial Planning Act (Raumordnungsgesetz)</td><td colspan="2"></td><td>Spatial supervision for principles of spatial regulations</td></tr>
<tr><td rowspan="2">Federal State (Länder)

Region (Region)</td><td>Federal State (Development) Planning</td><td rowspan="2">Spatial Planning Act and Regional Planning Law</td><td colspan="2">Integrated programs and plans</td><td>Principle and goals of Federal State Planning</td></tr>
<tr><td>Regional Planning</td><td colspan="2">Spatial sub-programs (regional programs and plans) of Regional Associations</td><td>Goals of Region (Certain determination)</td></tr>
<tr><td rowspan="4">County and Municipality</td><td rowspan="2">Urban land-use planning (Bauleitplanung)</td><td>Federal Building Code (Baugesetzbuch)</td><td rowspan="2">Urban land-use plans (Bauleitpläne)</td><td>Preparatory Land-Use Plan (Flächennutzungsplan)</td><td>Description of Land-Use (authority-obligatorily)</td></tr>
<tr><td></td><td>Local development plan (Bebauungsplan)</td><td>Determination for city's building regulations (landowners-obligatorily) (not parcel covering)</td></tr>
<tr><td rowspan="2">Council Building Regulations (Bauvorschriften)</td><td>Building Regulations of Federal State (Landesbauordnung)</td><td colspan="2"></td><td>Mat. controls and procedures</td></tr>
<tr><td>Local statute (Satzung)</td><td colspan="2"></td><td>Mat. Determination</td></tr>
</table>

Table 6: Planning System in Germany (adapted from Scholl, 2005 online)

In those spheres where the discharging of federal tasks calls for a local presence by federal authorities, the federal authorities display a multi-level organisational structure. This involves what are known as Intermediate and Lower Federal Authorities at regional and local level. In a number of areas, responsibility for discharging of the duties of federal authorities may be transferred to federal state authorities.

b) Federal State Authorities

Federal states are responsible not only for the implementation of their own laws, but also for the implementation of the majority of “Federal” laws.

As a general rule, federal state authorities employ a three-tier system of organisation; in some cases – and in particular in the smaller of the federal states - this may be a two-tier system;

- The supreme federal state authority is the state government, elected by the state parliament, and also the federal state ministries and various offices, which are usually assigned to a specific ministry (Federal State Department of Statistics, Federal State Criminal Investigation Departments);
- Federal states with a three-tier system of administration are divided into “Districts” (*Regierungsbezirke*) headed by a President of Regional Administration appointed by the federal state government; located at the level of the administrative districts are the regional subordinate offices of the higher administrative authorities;
- The lower-most level within the organisation of federal state authority is located at the counties and municipalities to the extent that the latter also perform state administrative tasks.

c) Counties and Municipalities

The counties and municipalities perform a dual function;

- In their function as local territorial entities, counties and municipalities also have the right to self-government. Counties too have a directly elected County Parliament (*Landkreis*) and a county administration.
- At the same time, the counties and cities not associated with a county, and to some extent other municipalities, performed the function of state administrative authorities. In this connection, the counties take on a large number of tasks which smaller municipalities are prevented from performing by the lack of personal and of material resources.

However, it is very important to understand that planning system in Germany separates the spatial planning (*Raumordnung*) from the other sectoral planning (*Fachplanung*). Planning system in the Netherlands and Switzerland includes all planning sectors – land-use, transport, infrastructure, and etc. - into their spatial planning. But, for the planning system in Germany, each planning sector is subjected to its own system and regulations. Land-use planning is subjected to the *Raumordnungsrecht* (Spatial Planning Law) and the *Öffentliches Baurecht* (Public Building Law). In transport planning sector, the *Bundesfernstrassengesetz* (Federal Highway Act), the *Nahverkehrsgesetz*

(Public Transport Act), and the other transport laws, regulate German's transport planning (see Figure 17). And, the developments of airports, like the new runway project, are regulated by the *Luftverkehrsgesetz* (Air Transport Act).

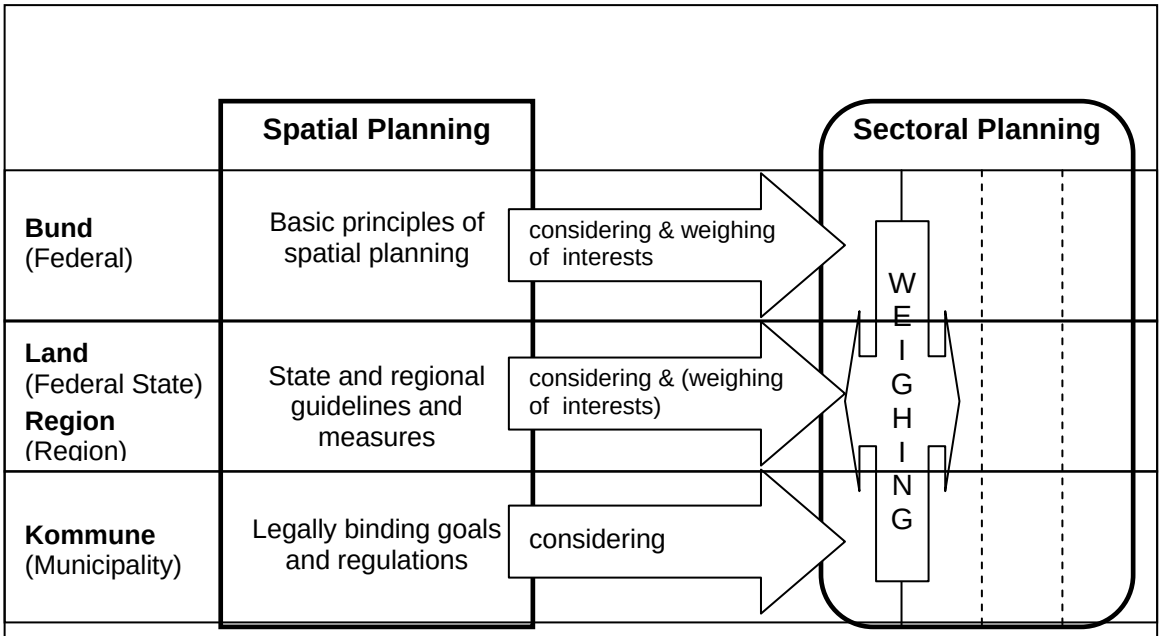


Figure 17: Planning System in Germany

Each planning sector has the goal on optimizing realization of its own sector. However, if each sector focused on the results on its sector alone, the conflicts among sectoral planning would likely happen. Therefore, it is the responsibility of the spatial planning to create the harmonization among planning sectors. This responsibility is a major element to achieve the goal of spatial planning, "Sustainable development of the planning area", which includes three aspects: ecology, economy, and social. Furthermore, spatial planning also plays the role in coordinating and weighing of interests (*Abwägung der Belange*) among different planning sectors.

There are three different cases of formal procedures for obtaining building permission; normal procedure, large public projects, and proposals with significant adverse impact on the neighbourhood or environment. Detailed procedures of each condition are as follows (Schmidt-Eichstaedt (Eds.) 1995):

Case A: Building proposals without a significant adverse impact on the neighbourhood or the environment would require use of the regular "*Baugenehmigung*" (Building Permission) procedure. The responsible authority is the municipal authority, the "*Bauaufsichtsbehörde*" or "*Baugenehmigungsbehörde*" (Building control / permission authority).

According to the Federal Ministry of Regional Planning, Building, and Urban Development (1993), normal building permission procedure required two authorizations: under the Building Regulations of Federal State (*Landesbauordnung*) in terms of the given regulations of the local development plan (*Bebauungsplan*) on basis of the federal building code (*Baugesetzbuch*) (see Table 6).

The major subject matter of a *Bebauungsplan,* defined in *Baugesetzbuch,* is: the definition of the kind of uses (building uses or other uses, and specifications of a building constructed in housing areas, industrial areas, etc.); the extent of the building (the site area that might already be built upon at that time, building height, the number of floors, etc.); construction plans and designations of the most important infrastructure and development projects particularly in relation to public roads and paths.

Federal State Building Code (*Landesbauordung*) serves the purpose of regulating the technical aspects of construction of physical structures on a plot. It is also important to exclude, as far as possible, the risk of any danger to public safety and order which might emanate from the structure and to ensure that planning regulations and building regulations of other kinds were complied with. Among the tasks of a building permit authority is that of examining whether a proposed building project contravened planning regulations and checking that the provisions of a public infrastructure (water and energy supplies, drainage, and links to the road network) had been followed.

Case B: Large public projects, for example, the fourth runway project at the Frankfurt Airport, would require two steps of special planning procedures, called the "*Raumordnungsverfahren* or *ROV*" (Spatial planning procedure) and the "*Planfeststellungsverfahren* or *PFV*" (Planning approval procedure), to be carried out as a rule.

The *Raumordnungsverfahren*, under *Raumordnungsgesetz* (Spatial Planning Act), is the assessment process for significant proposed projects or policies on their effects on spatial planning on a regional scale. It is a legally required process with participation of the representatives of related government organisations. The *ROV* is aimed to study whether the large public project's, in the particular planning sector, co-responses to the existing Spatial Planning Act and regional plan or not.

On a proposed project or policy, the *ROV* considers proposals in alternatives investigating their individual difficulties, problems and potentials. Moreover,

the *ROV* assesses the conceptual plan of the project, not in detail. Normally, participants in the *ROV* were project responsible bodies, public and private stakeholders, the *Träger Öffentlicher Belange* or *TÖB* (Environmentalists and people initiative groups), and nature protection groups (*Naturschutzverbände*). Results from the *ROV* must be considered as the basis for decision making in the following building permission process, the Planning Approval Procedure *(Planfeststellungsverfahren* or *PFV*).

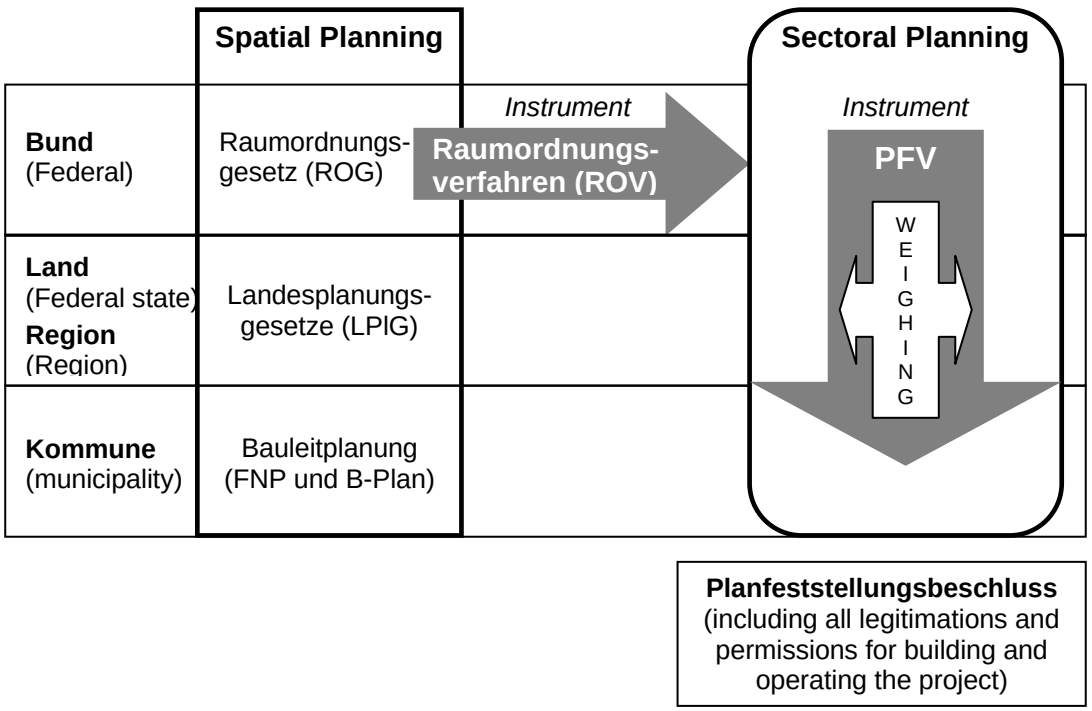


Figure 18: Registration approval process of a large public project (Case B)

The *Planfeststellungsverfahren*, based on *Luftverkehrsgesetz* e.g, the following process after the *ROV*, is the process for applying for a building permit for a large scale project on the particular planning sector. The project owner has to prove that his public project is based on a reasonable concept and he has followed any relevant planning acts. Planning administrator is the *PFV* decision maker. It is possible that the Planning Administrator would grant the application with conditions or limitations. Participants in the *PFV* are project owners, public hearing officers, Planning Administrators (in Hessen, the *Regierungspresident*), experts in related fields, the *TÖB*, and the public.

The *ROV* and *PFV* can be applied on every large public project, for example, to motorways, roads, railways, canals, airport, etc. During these multi-stage planning procedures, the admissibility of the project was regulated. At the end

of the process, building permission for the large public project was legally "fixed", with the prepared plans for the proposed development, in a legally binding act. This "fixing" occurred with the official publication of the approved plans. In the "new *Länder*", the permissibility of transport projects (motorways, federal main roads, federal canals, and airports) could be enabled directly by the federal legislature for a transitional period up to 1995. This shortened the time required for the various procedures (Scholl, 2005 online).

Case C: Private projects with a significant effect on the neighbourhood or the environment (in general, larger industrial projects such as furnaces, metal-processing facilities, chemical plants, etc.) would require a special license under the "*Bundes-Immissionsschutzgesetz*" (Federal Immissions Act). The "*Gewerbeaufsichtsamt*" (factory inspectorate), usually located in the "*Regierungsbezirk*" (District – a middle level authority of the Lander), is the relevant authority in these cases. Under this procedure, all legal and technical aspects of the project were examined together, resulting in a concentrated or all-inclusive permission. However, the Federal Immissions Act regulates on the technical process of the project, which can create the significance impacts on environment alone. The regulations under the Spatial Planning Act are not included in the *Bundes-Immissionsschutzgesetz*. To obtain the building permission, private projects also have to follow the normal procedure, as described in *Case A*.

3.3.3. Switzerland

A new article on spatial planning incorporated in the Federal Constitution in 1969 transferred responsibility for framework legislation on spatial planning to the Confederation. However, practical planning implementation was to remain essentially a matter of the Cantons, which, in turn, often delegated a number of tasks to the communes (local authorities).

Federal law stipulated only the principles and, therefore, did not constitute a set of rules which answered all important questions. Cantonal spatial planning and building regulations also contained public building regulations, often road construction regulations, and regulations on building land utilisation. The cantonal public building regulations are concerned with the requirements for building, the integration and form of buildings, and the requirements for construction, operation and maintenance.

The Cantons drew up a structure plan (*Richtplan*) which covered the whole area of the Canton, which was subject to approval by the Federal Council. First, they determined how the spatial development was envisioned in their area (Guidelines for spatial development, a comprehensive planning strategy).

The structure plan showed how the many activities of the Confederation, the Canton, and the Communes (local authorities), which have spatial impact, were to be harmonized with each other in the area. The structure plan also dealt with the questions of when and how the public tasks, which have spatial impact, were to be carried out. This produced a plan binding on the authorities, which, in agreement with the Confederation, showed neighbouring Cantons and bordering countries, how cantonal spatial planning was intended to progress towards the desired spatial development (Kanton Zürich, 2004 online).

Government Organisation	Legislation	Planning Instruments	Execution
Federal **(Bund)**	Nominal Spatial Planning Law: Federal Law about spatial planning as principle legislation Functional Spatial Planning Law: numerous special laws (*Sachgesetze*)	Concepts Special Laws (*Sachpläne*)	Consideration of requirements on spatial planning by the tasks of Federal Approval of Cantonal Guiding Plan (*Richtplan*) Appeal Law
Canton **(26 *Kantone*)**	Planning and Building Law (Conducting of principles for Federal Law)	Spatial Regulation Concept Cantonal Guiding Plan (*Richtplan*) Cantonal Land-Use Plan for strategic tasks	Approval of Community Plans (*kommunales Pläne*) Partial: Building Permits Supervision
Community **(3,000 *Gemeinde*)**	Building and Zoning Regulations (Framework Land-use Plan and Building Specification)	Community Guiding Plan Framework Land-Use Plan (Zoning Plan) Special Land-Use Plan (Special Building Specification)	Partial: Building Permits Building Inspection

Table 7: Planning system in Switzerland (Erberle and Muggli, 1999)

In the land-use plan (*Nutzungsplan*), the Cantons stipulated binding provisions on how land should be used in practice. Most Cantons delegated this task to the communes because they have the requisite local knowledge for plot-related land-use planning. However, many Cantons also provided cantonal land-use plans for projects, which were of importance for spatial planning policy.

Another important task of the Cantons is to issue building permits in order to enforce land-use planning; an official inspection was necessary before a building was erected. The building permit determined whether a project complied with the provisions of public law, in particular those of material spatial planning law. The project might only be carried out relative to control of building work: building without a building permit and exceeding of the terms of

the building permit must be authorised (building inspectorate). The permit responsibility of the Cantons was not applicable in cases where it was assigned to the Confederation under special legislation. This happened, for example in the case of many national transport infrastructures projects (motorways, railways, aviation facilities, pipelines, etc.)

Large Cantons often delegated supramunicipal spatial planning tasks to public-law planning associations (regional planning associations). In Canton Zurich, for example, these associations drew up regional structure plans which developed spatial planning on the basis of the structure plan for the whole Canton.

While the Canton was responsible for structure plans binding on authorities and covered its whole territory, it transferred responsibility to the communes relative to land-use planning binding on landowners, in particular delimitation of the building area from non-building areas, and determination of the type and extent of specific building use in the building zones.

The tasks of the cantonal structure planning system and communal (local authority) land-use planning were interlinked in a variety of ways: the transport systems at the national and cantonal levels, for example, have had a decisive effect on practical land-use planning (Muggli, 2002).

3.4. Case Study Descriptions

Each selected case study in this overall study is explained by its location, its accessibility, and its significant in land-use development and transport. The implemented formal and informal procedures, which are applied to each case study, are also presented.

3.4.1. Fifth Runway Project at the Amsterdam Airport

The expansion plans at the Amsterdam Airport Schiphol included a new fifth runway, *Polderbaan* (opened for operation the end of February 2003), the renovation of Departure Lounge 1 (due to open in 2005), as well as an innovative and relatively new automatic border passage system using iris recognition which enabled quick and secure border passage. Schiphol Group invested 340 million Euros in the new fifth runway, and will invest 165 million Euros for Departure Lounge 1.

Construction of the fifth runway at Amsterdam Airport Schiphol started in September 2000. The new fifth runway, *Polderbaan,* was designed to provide for the expected growth in air transport transitions or trips. The current number is 420,000 and was anticipated to increase to 520,000 – 600,000 by the year

2010. The new runway was also intended to eliminate noise disturbance in the airport environs. It was operational at the end of February 2003. The opening of the new runway coincided with the enactment of the revised Aviation Act (effective in January 2003), which incorporated new environmental and safety standards (The website for the airport industry, 08.03.2003, online).

Project	The fifth runway project (*Polderbaan*) at the Amsterdam Airport
Location	At the intersection of A4 and A5 to The Hague and Rotterdam
Project's data	The fifth runway with expected up to 600,000 aircraft movements per year
Significance	4th in Europe for passenger traffic and number of aircraft movement 3rd in Europe for freight transport Airport Railway Station, 6th most used station in the Netherlands Intermodal interchange node with high-speed Thalys and ICE train stations, regional trains, trams and buses
Accessibility	A4 and A5 motorways A9 and A10 orbit motorways by-pass Amsterdam International and domestic train station (links to 75% of all railway station in the Netherlands) below the platform Zuid-Tangent (a regional public transport service) Sternet (a regional bus service)
Project's elements on transport system	A bridge over A 5

Table 8: Data of the fifth runway project at the Amsterdam Airport

From the statistics of European Airports (1999), Amsterdam Airport was ranked fourth for passenger traffic and number of aircraft movement, and third for freight. During the last decade, the Amsterdam Airport has seen a major concentration of development around the airport. The national "mainport policy" stimulated such growth, defining Amsterdam Airport as both an airport and an economic vehicle. The airport is located on the intersection of two major high ways, A4 and A5, which linked the airport to The Hague and Rotterdam.

Airport Railway Station (Schiphol Station) has gained a key position in public transport networks for the northern half of the *Randstadt*. It is the country's sixth most used railway station (some 46,000 passengers / day). Schiphol Station already fulfils a major interchange function between Intercity trains, regional/local trains and buses in the region. It is also to become the main High Speed Train station for the Netherlands, where both the TGV Nord and the German ICE will meet. This connection is crucial to provide extra capacity at the airport.

The Zuid-tangent, a free-lane regional bus line with a relatively high average speed (42 km/h), which can be upgraded to a fast tram-line, fills in a missing

tangential link in the regional public transport network in the greater Amsterdam area. This new high-quality service will have four stops on the airport territory. Also, the *Sternet* is a bus service offering made-to-measure public transport for a large part of the 50,000 employees at the airport and passengers form the region. *Sternet* links all urban centres within twenty kilometres from the airport to it in a star-shape manner (Güller Güller architecture urbanism, 2001).

Formal procedure

The Netherlands government considered the development of Schiphol Airport as the national issue. Therefore, its development formed part of strategic plans from all levels:

National spatial plan (1995) by Department of Housing, physical planning and the environment and Department of Transport – Key planning decision (*PKB – Planologische Kern Beslissing*) for Schiphol and surroundings. The decision to expand the capacity of Schiphol Airport – the fifth runway project – was made. In this plan, Schiphol Airport has been given mainport status.

Province of North-Holland Regional Plan (1995) by the Provincial spatial planning commission – Partial review of the *Streek plan ANZKG* for the area Haarlemmermeer / Schiphol (*Partiele herziening Streekplan ANZKG*). The regional plan set out a strategic framework for the development of the airport region (co-ordination and stimulation of investment).

Zoning Plan 1998 (*Bestemmingsplan*) – The city of Amsterdam and the local communities were to provide a vision for further development of their authorities. Around 120 legal permits were passed for implementation of several detailed political decisions.

Since the development of Schiphol Airport was considered as a national issue, the decision to construct the fifth runway was granted by national authorities. That meant this project did not require a building permit. The formal procedure for this project was processed at the national level. Therefore, regional and local plans must conform to this project. Then, an informal procedure was established whose purpose was to facilitate the construction of this project, including co-ordination with plan-making at the regional and local levels.

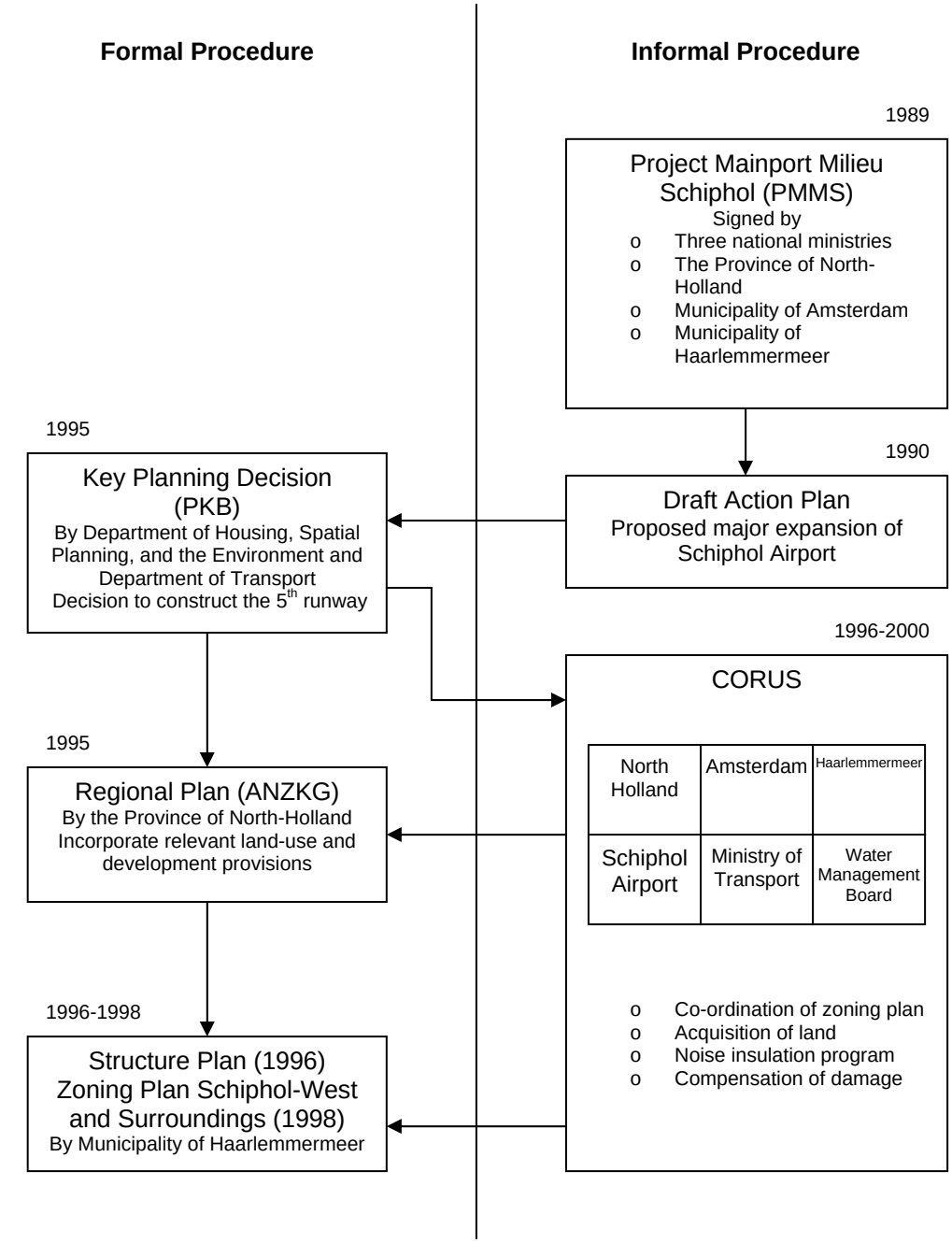


Figure 19: Procedures for the fifth runway project at the Amsterdam Airport

Informal procedure

In this project, a formal procedure was processed before an informal one. The results from the formal procedure became the framework of the informal procedure. Actually, a broad set of instruments to co-ordinate airport development and mediate between the different interest groups has been set

up, dealing with issues such as airport capacity expansion, noise impact, and the promotion of economic growth around the airport.

CORUS (1996 – 2000) was one of those instruments. It was to facilitate the evaluation process for the construction of the fifth runway. It was intended to co-ordinate the formal procedures of the zoning plan, the necessary legal permits, as well as acquisition of land, noise insulation program, and compensation of damage.

CORUS was composed of six parties to co-operate and to set up a small office for co-ordination tasks. The members were:

- Ministry of Transport
- Province of North-Holland
- Municipality of Amsterdam
- Municipality of Haarlemmermeer
- Amsterdam Airport Schiphol
- (later joined) Water Management Board of Haarlemmermeer

The province of North-Holland was the chairman of CORUS and, to some extent, acted as the neutral party. However, CORUS did not have so much to do with conflicts among the members, as the major political decisions were already taken by national planning authorities before CORUS started. Moreover, members in CORUS were not invited as stakeholders, but as relevant decision-making organisations.

3.4.2. Amsterdam Zuid-As

In response to the constant demand for high quality office space, Amsterdam has embarked on an ambitious and prestigious project called the “Zuid-As” (south axis), a new city centre that was to become the top business location in the Dutch capital city. The Zuid-As would be situated along a stretch of Amsterdam’s A10 circular road between the historic city centre and Schiphol International Airport. This cluster of residential and prime office space would be linked to the centre and to the world through an impressive network of rapid transport links.

Already confirmed as a prime location by global companies, the South Axis was designed to become one of the most prestigious business developments in Europe. The Amsterdam Zuid-As Master plan, currently under review, would create a completely new, multifunctional urban environment in which people worked and lived. The forty-year re-development program included hi-tech offices, leisure/shopping facilities, homes, by placing all transport infrastructure underground. This could free up enough extra land for over

1,000,000 m² of office space and 500,000 m² of housing, with leisure facilities and open spaces (AAA, 10.03.2003, online).

Project	Amsterdam Zuid-As
Location	On either side of southern section of A10 (ring road) between the historic city and Schiphol Airport
Project's data	1,000,000 m^2 office spaces 500,000 m^2 residential spaces Leisure facilities Open spaces
Significance	Located between two major centres in the region New train station "Zuid/WTC" with up to 200,000 passengers a day in 2020
Accessibility	A 10 ring road high speed train "Zuid/WTC" station at the hearth of the project underground, tram and bus
Project's elements on transport system	A 1.2 km. under A10 tunnel with real estate on it High speed train station linked to several large cities in Europe

Table 9: Data of Amsterdam Zuid-As

The Zuid/WTC station, located at the heart of this project, will probably grow to be the fifth largest station in the Netherlands, catering to 200,000 passengers daily. Train, metro, bus, (fast) tram and high-speed rail link all converge here, and safe, attractive routes will be provided for pedestrians and cyclists. The southern section of the A10 ring road and the train and metro tracks currently split the area in two, but the municipality wants to move this infrastructure underground along a distance of 1.2 km between the Amstelveenseweg and the RAI station, thereby reuniting the two separated areas and creating more space for living, working and relaxing (www.zuidas.nl, 2003).

Formal procedure

Amsterdam Zuid-As is a metropolitan project, which means that the City Council carries the final administrative responsibility for developments in Zuidas Region. In 1991, the agreement on the Zuid-As development process was signed by the Department of Housing, Spatial Planning and the Environment, the Department of Transport, the City of Amsterdam, and the Amsterdam Alderman Stadig. In 1995, the College of Mayor and Alderman had set up the *BOZ* (*Bestuurlijk Overleg Zuidas* – Zuidas Management Consultative Committee) which, under the chairmanship of the alderman, manages the development process. He is also on the commission of the party for the project organisation "*Projectbureau Amsterdam Zuidas*" (Zuidas Project Office). In the BOZ, administrative co-ordination took place between the municipality of Amsterdam and Zuider Amstel city district, where Zuid-As is situated.

However, the end-product of *BOZ* was the master plan (vision for the whole area) of Zuid-As project, not building permits. The project was sub-divided in many small parts and each part would apply for its building permit. The *BOZ* was expected to be lasted around one year, and it could be delayed considerably by the lawsuits.

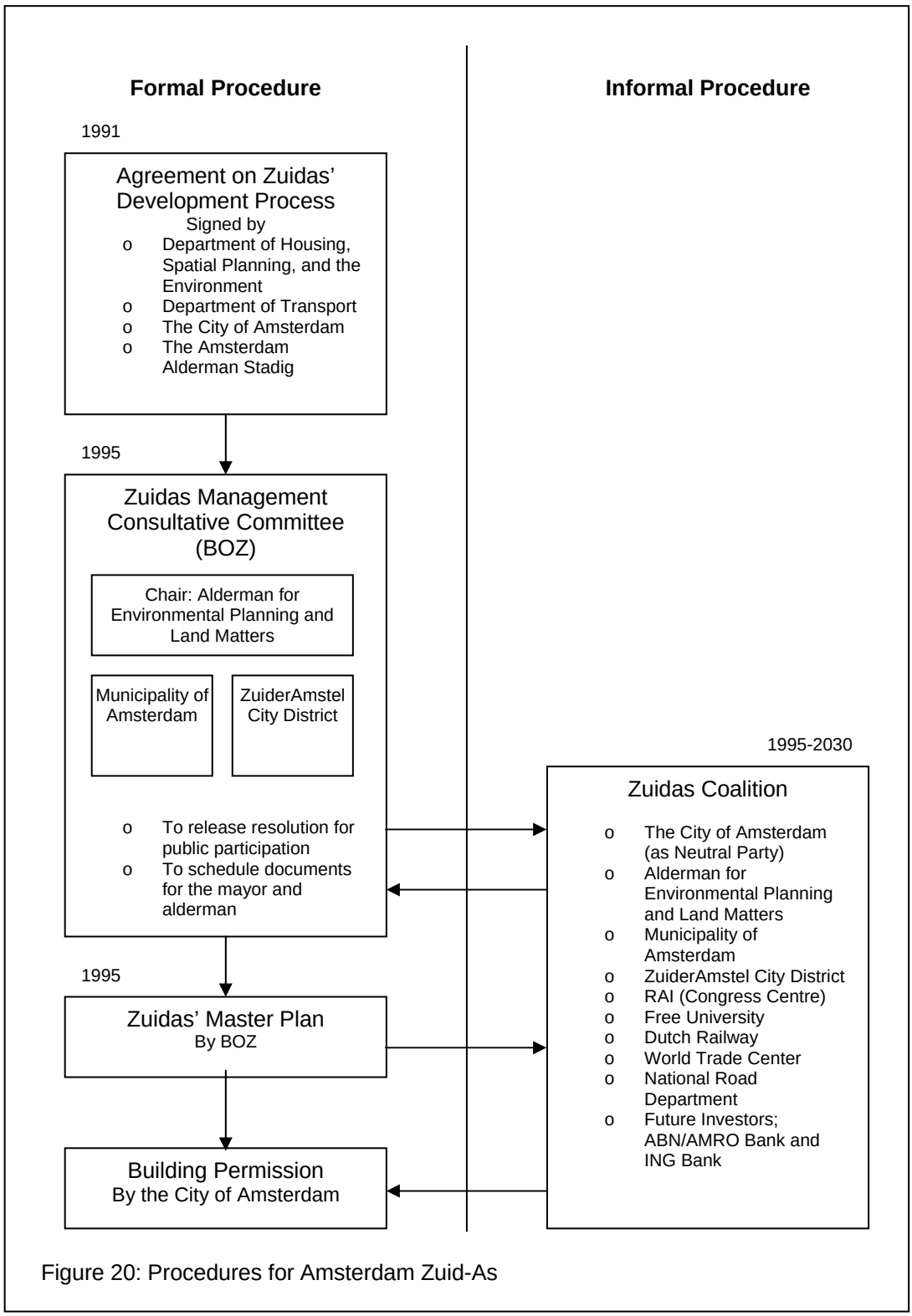


Figure 20: Procedures for Amsterdam Zuid-As

Informal procedure

The City of Amsterdam had some bad experiences with large scale projects that were initiated without much market-support. To give Zuid-As project a successful start, Zuidas Coalition was aimed to effectively use the resources of large private parties and other stakeholders in the area. It was composed of the members of project's formal procedure (*BOZ*), the existing land owners and the current users of the area (RAI (congress centre), *Vrije Universiteit*, Dutch Railway, World Trade Center, national government (road department)), and the future investors (ABN/AMRO bank and ING bank). The City of Amsterdam played the neutral party role (www.zuidas.nl, 2003).

Zuidas Coalition started in 1995 and was expected to be operating until the end of the whole project in 2030. Currently, the results from the Zuidas Coalition were agreements among the members. It was proposed to expand railways, high-speed trains, and light rails to Schiphol Airport. The results were considered as the input for formal procedure "*BOZ*".

However, there was very much doubt about the neutral party, the City of Amsterdam, because they wished to develop the Zuid-As as an international top location for offices and housing. Furthermore, some participants were not satisfied with the long and slow decision-making procedures of the politicians.

3.4.3. Fourth Runway Project at the Frankfurt Airport

The current runway capacity of seventy-eight co-ordinated takeoffs and landings each hour fell short of the current demand for up to one hundred aircraft transitions per hour. As a result, about fifteen percent of slots requested during peak traffic periods could not be met prior to 2003. From 2003 onward, it would no longer be possible to compensate for this capacity deficit. In order to remain competitive, the airport should increase this figure to 120 over the next few years.

As a way of dealing with the rising levels of air traffic, Frankfurt airport has examined the idea of adding another runway or, as an alternative, reusing an old air force base. The Wiesbaden-Erbenheim military air base is still under the control of the US Air Force despite no longer being used for military purposes. The use of this air base for civilian purposes would allow about 60,000 additional transitions each year.

A second main solution would be to build another runway. The north runway would be connected to the existing runway system and the airport infrastructure as a whole by means of a taxiway, which included a bridge over the highway and the ICE track. This solution would allow the existing apron,

terminals, freight warehouses and hangars to be used. Construction of a fire station would be required in the area for safety reasons. If constructed, the north runway could offer Frankfurt airport about 150,000 additional transitions per year, which would significantly expand the airport's capacity (The website for the airport industry, 2003). On the ground accessibility aspect, the new runway project was expected to increase 59 % of private vehicle trips and 157% of public transport trips (daily, compare to the number in 1998).

Project	The fourth runway project at the Frankfurt Airport
Location	On the intersection of A 3 and A 5 (Frankfurter Kreuz), the most congested intersection in Germany
Project's data	A new northwest runway which can increase to 120 aircraft movements per day with the number of passengers to 7.2 Million and Cargo to 3.6 Million Tons per year
Significance	2nd in Europe for passenger traffic 1st in Europe for freight transport A significant intermodal interchange node with long-distance train stations, regional trams and buses
Accessibility	A3 Bonn to Munich (east-west) A5 Hamburg to Basel (north-south) A regional railway station with 230 trams daily AirRail terminal, a High Speed Train station Regional buses
Project's elements on transport system	Private vehicle trips +59% Pubic transport trips +157% (daily, compare to 1998)

Table 10: Data of the fourth runway project at the Frankfurt Airport

From the statistics of European Airports (1999), Frankfurt Airport was ranked second for passenger traffic and number of aircraft movements, and first for freight. It is located on the "Franfurter Kruez" intersection of A3 (east-west, Bonn to Munich) and A5 (north-south, Hamburg to Basel), which is the most congested intersection in Germany. Fraport AG promotes intermodality and advertises itself as a multimodal interchange node: a combination of air terminal, a regional railway station (since 1972), and the new ICE High Speed Train and Intercity terminal (since 1999). The result is a highly developed access infrastructure: an integrated transport hub – more than just an airport (Güller Güller architecture urbanism, 2001).

Formal procedure

In 2000, the expansion concept was approved by the Federal government. As the new runway project fell into the large public project category, it required the *ROV* and the *PFV*.

The *ROV* represented the first of two legal approval procedures required for the expansion of Frankfurt Airport. During the *ROV*, the Fraport, primarily in terms of “compatibility with regional planning” (e.g., other developments and land uses) and “environmental compatibility” (e.g., forest and land space requirements), opened at the end of August 2001. The *ROV* procedure was concluded in June 2002, with a presentation of the Regional Planning

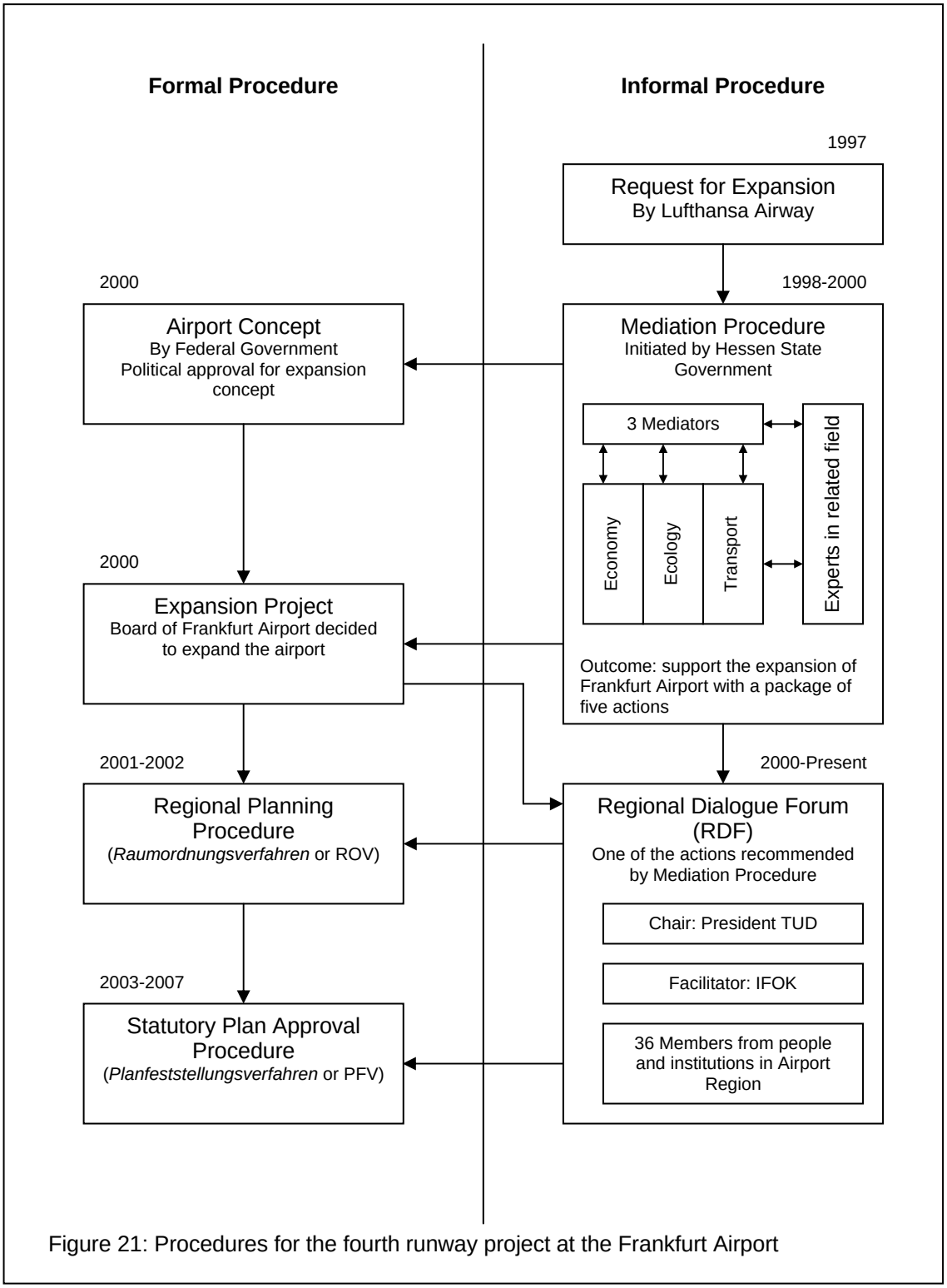


Figure 21: Procedures for the fourth runway project at the Frankfurt Airport

Evaluation Report. This concluding report found Fraport's plan for constructing a new landing runway to the northwest, and a new flight operations area at the southern part of Frankfurt Airport, to be compatible with regional planning requirements. In practice, this meant that Fraport could file a zoning request for the planed northwest runway and new flight operations area once the conditions set forth in the *ROV* concluding report were fulfilled.

The *PFV* is the second of the required approval procedures. Based on the results of the *ROV*, the *PFV* verified whether expansion plans conformed to the zoning code, and determined the appropriate implementation modes for airport expansion. The participants in *PFV* were *Regierungsprasidium* Darmstadt, Hessian ministry of Economy, Transport, and Regional Development, Fraport AG, neighbouring communities, experts in related fields, environmentalists, and citizens. On September 9th, 2003, Fraport AG filed an extensive zoning application with numerous expertise and documents at the Darmstadt district office of the State of Hesse. Part of these documents included an application for a limitation of night time flights between 23:00 and 05:00 hours in order to prepare the implementation of the mediation recommendation by the responsible government agency. The *PFV* was scheduled to be finished in 2007 (Fraport, 2003 online).

Informal procedure

In the summer of 1998, the Hessian state government proposed a mediation procedure (*Mediationsverfahren*) relative to the expansion proposal of the airport. The Mediation Group composed of twenty-one participants. They were representatives of the neighbouring communities, the "Offenbach Air Traffic Noise Association" citizen's action committee, affected federal and state ministries, trade associations, and trade unions. Also represented were Fraport AG, Deutsche Lufthansa, *Deutsche Flugsicherung GmbH* (DFS – German Air Navigation Services), and BARIG (Board of Airline Representatives in Germany). External experts from related fields were invited to give their opinions and comments. The group was jointly chaired by three highly respected persons as mediators (Fraport, 08.03.2004, online). In the procedure, three discussion groups were established-economy, ecology, and transport. Ground accessibility was considered as an important topic in the transport discussion group. Several policies and proposals were proposed to ensure the accessibility of the airport and Frankfurt region.

After eighteen months of the procedure, the Mediation Group submitted its final report in Wiesbaden on January 31st, 2000. It had agreed on a package of five actions which were binding on the participants: optimising the existing railway system, extending airport capacity, a night-flight ban (23:00 – 05:00

hours), an anti-noise agreement, and the creation of a regional dialogue forum (concerning problems in relation to airport expansion).

From one of the recommendations laid down by the *Mediationsverfahren*, the Regional Dialog Forum (RDF) was established in 2000. RDF was aimed to arrange the following informal procedure of the *Mediationsverfahren*. RDF was concerned with the development of Frankfurt and with its consequences on the Rhein-Main area, both currently and in the future. RDF was made up of a group of thirty-six members (Dialog Forum) and a dialog opportunity for people and institutions in the region. The chairman of the RDF was the president of the TU-Darmstadt. Management was undertaken by the Institute for Organisational Communication (IFOK). The Oeko-Institute for Applied Ecology provides scientific advice. The RDF meets roughly once a month for several hours (Regional Dialog Forum, 2005 online).

3.4.4. AirRail Center Frankfurt

Simultaneously with the construction of the AirRail Terminal, a 660 meters long deck was built above the four ICE tracks. The Airport Frankfurt Main AG hoped to have an AirRail Center built on top of it, by 2004, which would provide a service centre of some 170,000 square meters of floor space.

Project	AirRail Center Frankfurt
Location	On the roof of the ICE Station “Frankfurt Airport”
Project’s data	A 680-room hotel 170,000 m^2 office spaces 75,000 m^2 and commercial spaces More than 1,000 parking spaces
Significance	A new city centre Intermodal interchange node with long-distance train stations, regional trams and buses
Accessibility	direct feeder road from the motorway A3 using Hugo Eckener-Ring and the national road B43
Project’s elements on transport system	A bridge without centre support over A3 Linkage to B43

Table 11: Data of AirRail Center Frankfurt

The deck had been a major risk which required a pre-investment by FAG (2/3) and the German railways (1/3) for an “empty platform” awaiting potential future clients to build on top of it. The risk paid off: FAG and DBAG have been successful in acquiring clients for their 425 million Euro project, with a record time of less than one and a half years. In the eight to nine storey high complex, two hotels would be built, an office centre, 75,000 square meters of commercial surface, a medical care centre, and some 1,000 parking spaces. It was a visionary project, unique of its kind, and was realised just before the

German Railways reached their present rather critical financial condition which would no longer allow for such pre-investments anywhere in Germany (Güller Güller architecture urbanism, 2001). This project also included the proposal to construct a bridge without centre support over A3 to connect the project to the national highway system and the linkage to B43 would be improved.

In 1998, a “Dipole Study” was launched by the airport, the city, the railways, and the *Rhein-Main Verkerhsverbund* (Regional Public Transport Executive). It defined the respective roles of the two ICE-stations for the region in order to avoid the divergence of the different transport services. The study concluded that:

- The high quality of accessibility to the city has to be preserved and the new AirRail terminal accommodated in a way as to make it an added value for the region
- The main node of the international High Speed Train connections has to stay at the Central Station.
- To avoid a shift of long-distance traffic to the airport station, the link between the airport and the Central Station has to be improved, and travel time minimised.

The new AirRail terminal, operative since 1999, will be attractive as landside interchange. The Dipole Study expected that only two-third of all travellers at the AirRail terminal were going to be air passengers. The other one-third, some 12,000 travellers per day, would use the AirRail terminal as origin or destination station for a High Speed Train trip (Boltze, 1998).

In addition to the new AirRail ICE terminal, the airport has had, since 1972, a highly frequented regional train station (230 daily connections), located between the AirRail terminal and the air terminals. This resulted in an average modal split of approximately 30% by public transport (Güller Güller architecture urbanism, 2001)

Formal procedure

The project AirRail Center Frankfurt was considered as normal private building. Also, this project was subjected to Section 34 of Federal Building Code (*Baugesetzbuch*), for the development projects within built-up areas. Therefore, AirRail Center Frankfurt must be blended with the characteristic features of its immediate environment and the provision of local public infrastructure must be secured. The requirements of healthy living and working conditions must be satisfied; the overall appearance of the locality should not be impaired. The procedure for building permission for the AirRail

Center Frankfurt conformed to the normal process already discussed in chapter 3.2.2. In 2000, the project responsible bodies submitted the preliminary project design to the City of Frankfurt and received the positive comments.

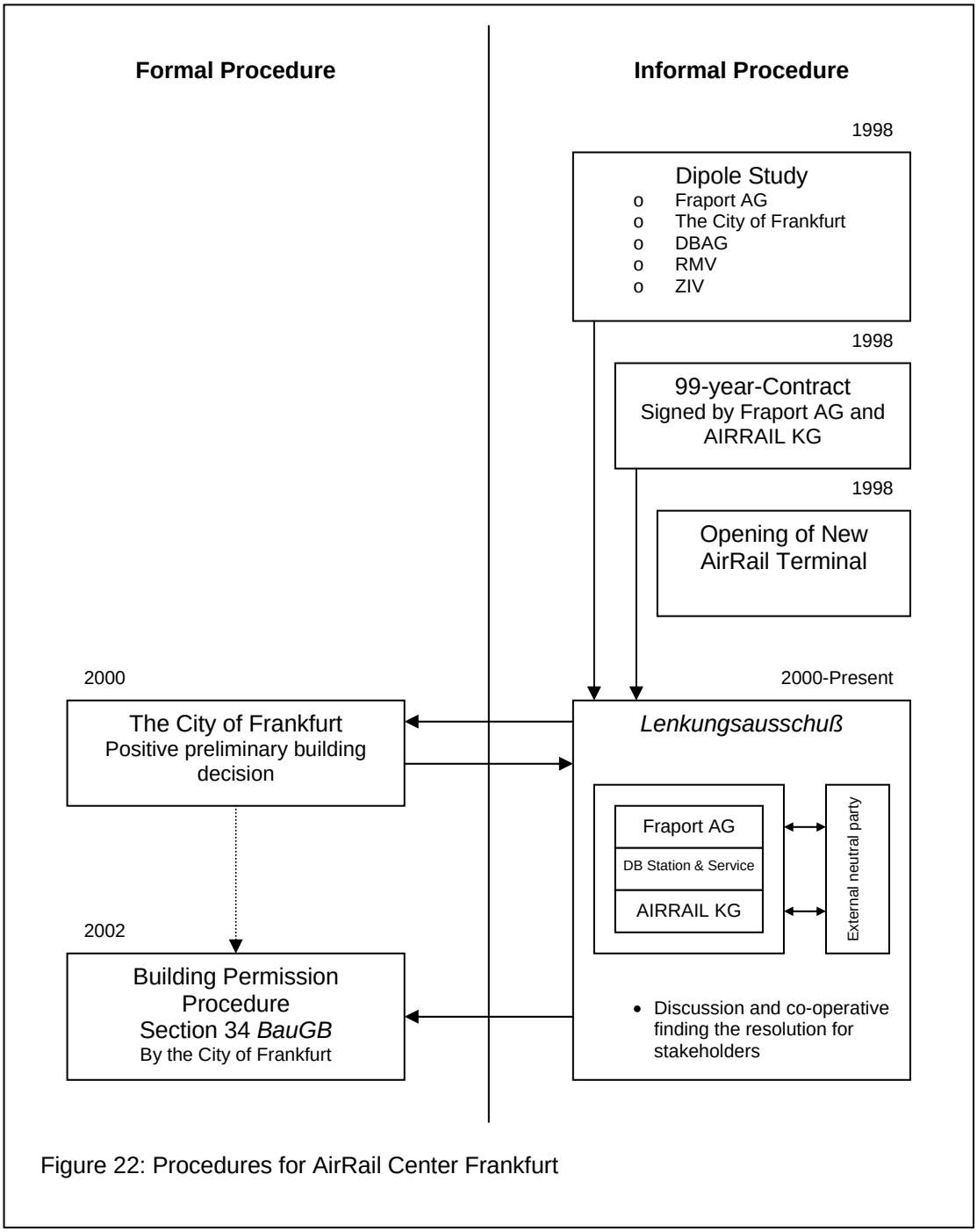


Figure 22: Procedures for AirRail Center Frankfurt

Informal procedure

The informal planning procedure of AirRail Center Frankfurt – the "*Lenkungsausschuß*" – started at the beginning of 2000. Participants of this informal group were representatives of Fraport AG (landowner), DB station and Service AG (operator of the AirRail Terminal), and AirRail KG (project's

operator). This informal procedure was conducted by a facilitation formation. The neutral party was Bilfinger/Berger Projektenentwicklungs GmbH. Also, they used the “Dipole Study”, launched in 1998, as guidelines for their ground access system planning. The results from this informal group would be a part of a plan for applying to the City of Frankfurt for building approval.

Participants of the *Lenkungsausschuß* met on Mondays (2 p.m. to 4 p.m.) every two weeks. Up to the end of August 2003, meetings were held twenty-five times, and there were twenty-five more meetings left (until the completing of construction in March 2006). However, the City of Frankfurt’s planning authority is concerned about the effects of this project on the current business centre in the hearth of Frankfurt. Frankfurt airport is also concerned about the airport’s accessibility which would be affected by the additional trips generated by this project.

3.4.5. Europa-Viertel

The Europa-Viertel is the largest redevelopment project in Frankfurt. It is located in the heart of Frankfurt, and is a modern, international business centre which combined residential housing, commerce, and entertainment. Covering over 220 acres of land, the new city district would be built on the grounds of the former cargo railway station by Vivico and Aurelis in close co-operation with the City of Frankfurt. Current building plans included offices, commercial space, and residences totalling 300,000 square meters and a budget of 4.1 billion Euros over the next ten years. A 200 feet wide boulevard flanked by cafes and shops would serve as the main traffic artery and public area. The Urban Entertainment Center (UEC) would form the eastern end of the boulevard. At the other end, a “*Europa-Park*” and the “*Wohnpark in Grünen*”, a quarter characterised by high-quality urban living, would be located (Vivico Real Estate, 2003, online).

With good accessibility created by S-Bahn and U-Bahn, a large number of additional trips are expected to be taken by public transport. The boulevard was designed to create the linkage of the project to regional and national road network. Furthermore, routes for through traffic trips would be separated from those for project-based trips. A by-pass ramp and a tunnel to avoid noise problems to the residential areas on the west end of the project were also proposed.

Project	Europa-Viertel
Location	West side of city centre of Frankfurt, the former goods station of DBAG
Project's data	300,000 m^2 of office, commercial, and residential spaces Urban Entertainment Center 200 feet wide boulevard Europa Park Wohnpark in Grünen
Significance	The Largest urban redevelopment project in the Rhein-Main Region with access to the major national highway A5
Accessibility	Road A5 S-Bahn U-Bahn
Project's elements on transport system	The linkage from the project's Boulevard to A5 Separation of through traffics and project-based trips A tunnel to avoid the noise problems to the residential areas on the Westside of the project

Table 12: Data of Europa-Viertel

Formal procedure

The building permission process of Europa-Viertel fell into section 12 of the Federal Building Code (*Baugesetzbuch*). The city of Frankfurt employed a project-based binding land-use plan (*Bebauungsplan Nr.826*, 2003) to determine the admissibility of a development project. Europa-Viertel and its infrastructure became an integral part of the project-base binding land-use plan. The development plan dispensed with the requirement to provide information and entered into the discussion, followed section 3 of Federal Building Code. The public was to be informed about the project, and a draft of the land-use plan, with an explanation report, were to be put on public display for a period of one month. Public participation of the project-based binding land-use plan began on May 20th, 2003. Also, the city of Frankfurt obtained comments and opinions from public authorities, neighbouring municipalities, and third parties whose activities were affected by the planning of Europa-Viertel. The procedure of building permission for Europa-Viertel conformed to the normal process already discussed in chapter 3.2.2.

Informal procedure

The informal planning procedure of a ground transport plan for Europa-Viertel began in 2001, under the title of "*Aktionsplan integrale Verkehrskonzeption*" (Action plan of integrated transport concept). Participants in this informal planning group were divided into an advisory board and a working group. The advisory board was composed of experts in related fields, key persons of the state of Hessen, city government, and landowners. Participants in the working group were subordinates of participants on the advisory board, including project designers, transport providers, and facilitators (ProProjekt GmbH). A

steering office was organized for further work on issues discussed in the meetings.

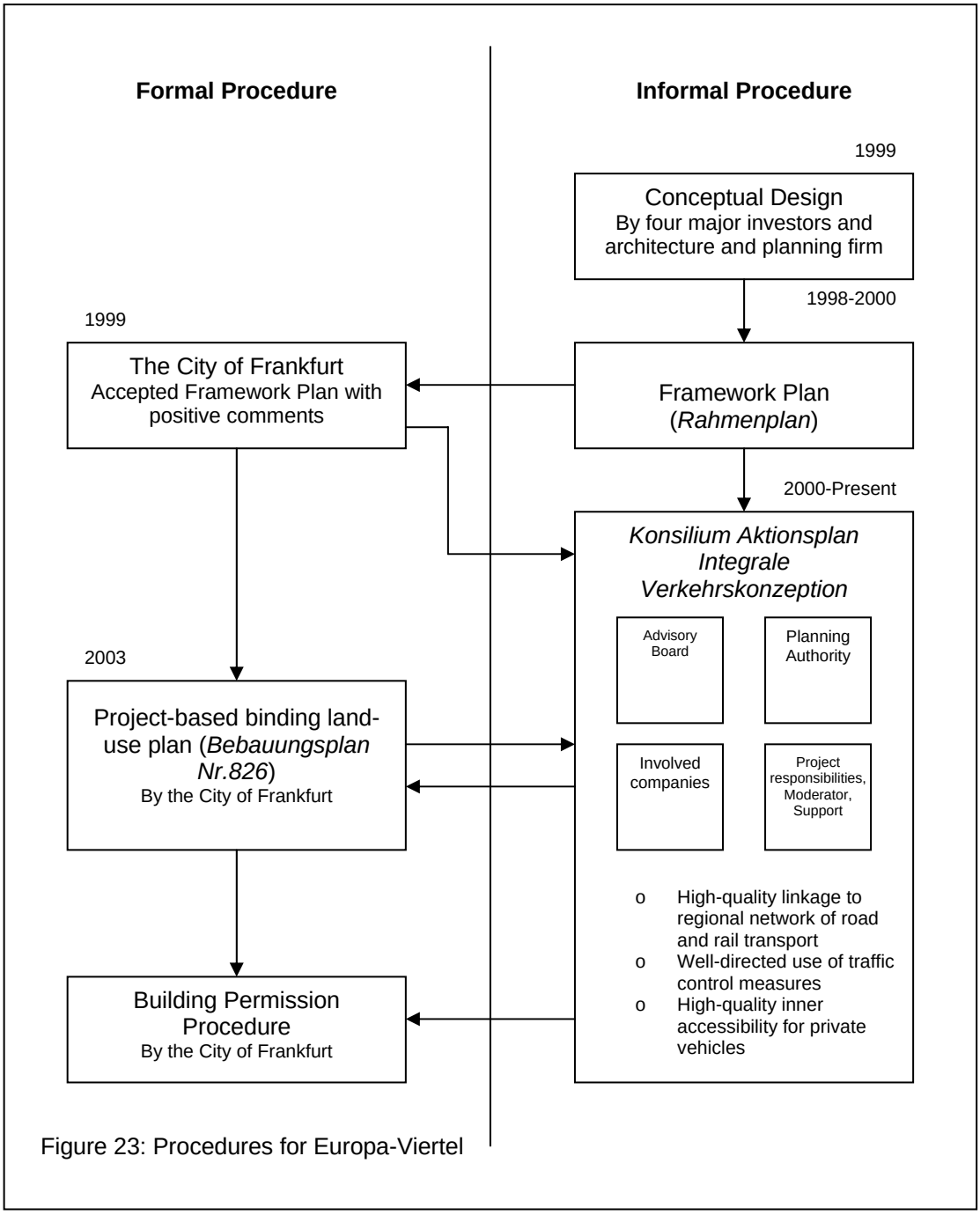


Figure 23: Procedures for Europa-Viertel

The purpose of this informal planning group was to design an appropriate ground access plan for creating high-quality access (both private vehicles and mass transit) to the activities of the project as well as efficient linkage to the regional transport system. The participants met every three months over the two and a half years of the informal procedure. Each meeting ran two full days. The budget for this group was about 500,000 Euro per year, which was paid by the investors. The report of every meeting was recorded and

circulated to all participants. However, the time frame had to be extended for one more year.

3.4.6. Fifth Expansion Project at the Zurich Airport

After being approved in 1995, the planning phase of the fifth expansion stage at Zurich Airport was initiated. From this, an innovative airport expansion program has been developed that included the modernisation of existing facilities together with the integration of new elements designed to make Zurich a state-of-the-art international airport with first-class services.

Project	The fifth expansion project at the Zurich Airport
Location	10 km. north of the City of Zurich
Project's data	Airside Center – New central hub of the airport Midfield Pier – a new passenger processing terminal Skymetro transportation link A new taxi runway A service tunnel for improved ground transport A new baggage handling system
Significance	10th in Europe for passenger traffic 5th busiest railway station in Switzerland
Accessibility	Train to City, every 10 minutes Long distance train, every ½ hour A51 connects the airport to the city
Project's elements on transport system	Current modal split: 66% private vehicle trips and 34% mass transit trips Proposed modal split: 58% private vehicle trips and 42% mass transit trips

Table 13: Data of the fifth expansion project at the Zurich Airport

At a total cost of CHF 2.4 billion, the fifth expansion envisioned construction of the Airside Center, the new central site of Zurich Airport. This central site included a new passenger processing terminal, the Midfield Pier, a Skymetro transportation link, a new taxiway system with de-icing pads, a service tunnel for improved ground support, and a new baggage handling system. This new internal infrastructure would be supported by improved passenger transport links that included a restructured road system and improved rail links. The overarching aim of the fifth expansion was to place Zurich Airport, already one of the ten biggest airports in Europe, into a position that would truly cement its position as one of the world's leading air-transport hubs (The website for the airport industry, 08.03.2003, online).

The most up-to-date technology would be used to enable Zurich Airport to handle up to eighty flight transitions an hour. These new facility developments meant that the airport would almost double its number of passenger check-in and check-out counters and agents. Thus, with a higher density of traffic but

an improved management system and taxiway layout, the airport would be well-positioned to lower turnaround times and reduce taxi times.

Located on the north end of a development corridor, Zurich Airport already has a high accessibility by public transport, enhanced by the fact that it is also strongly used as an Interchange for regional networks. The airport has the 5th busiest railway station in Switzerland with long-distance and regional trains. The modal split for public transport is high already, with 34% of passengers and employees arriving by public transport. The fifth expansion project promised to increase this share to 42% after the project was completed (Güller Güller architecture urbanism, 2001).

Formal procedure

Section 87 of the Swiss national constitution indicated that air transport, including airport construction, is national issue. For this reason, the Department of Environment, Transport, Energy, and Communication accepted the responsibility for the airport, airport operation, public transport for airport accessibility, and airport construction, as well as construction concessions. In August 1992, Flughafen Zürich AG, as airport operator, obtained the concession from Swiss national authority to build or expand the airport.

In the Zurich Cantonal Plan, ground accessibility, airport development and its impacts on regional development were considered as important issues. However, section 13 of RPG indicated that national (*Bundes*) and regional (*Canton*) organisation must work together on airport operation planning. Results from the co-ordination were (Kanton Zürich, 2004 online):

- Master plan (conceptual) of Zurich Airport with the fifth expansion project was granted in June 1992.
- Take-off and Landing routes permission was under the *Regierungsrat*, with the permission of National Office for Civil Air Transport (*Bundesamt für Zivilluftfahrt – BAZL*)
- Runway planning co-ordinated with noise and safety zones affected by take-off and landing routes. Anti-noise plans and agreements must conform to national regulations.

Because Zurich Airport was owned and operated by the Canton of Zurich until March 2000, the fifth expansion project had to be approved by the Canton's population by public vote. Citizens approved the expansion by a majority of 66%, especially because the airport promised to pay sufficient attention to the environment. One of the important subjects was ground transport. As one of the results from its informal procedure, the airport monitored this multi-modal split and made concessions about further development. Instead of a 34%

share for public transport, Zurich Airport promised a share of 42% for public transport at the end of the fifth expansion project (Spörri, 1998).

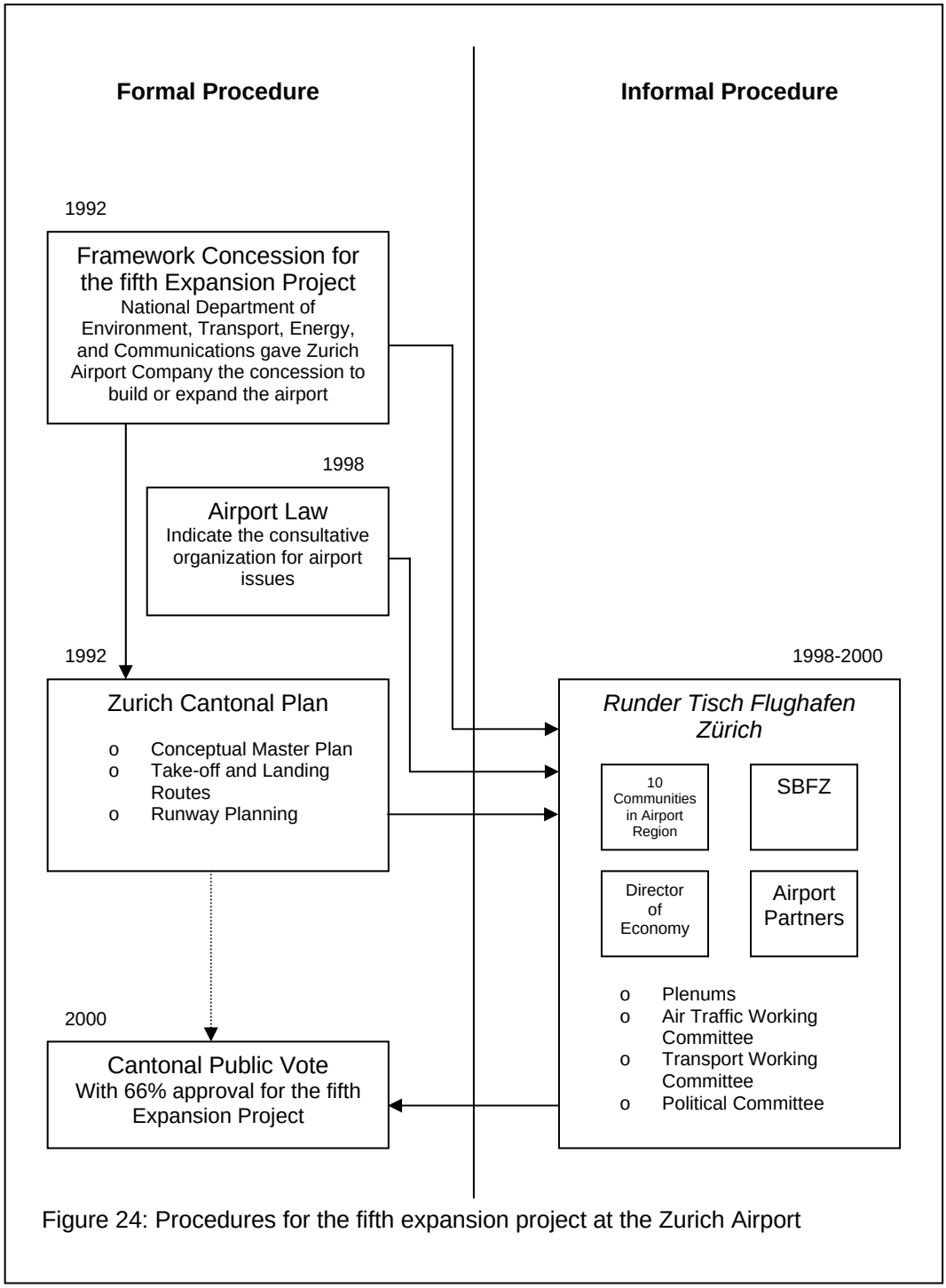


Figure 24: Procedures for the fifth expansion project at the Zurich Airport

Informal procedure

The legal foundation for the *Runder Tisch Flughafen Zürich* (*RT*) was set by the parliamentary counsels by paragraph 4 of "Airport Law" (June 12th, 1999). It was indicated that a consultative organisation, led by a responsible planning authority, would be established for discussions on an airport's issues.

According to the results of the Airport Law, the *RT* did not have any decision-making authority. The *RT* had a consultative function for the information and opinion exchanges. The concepts of the *RT* came from an independent office for operational advice on environmental issues. The *RT* co-operated with a government council and the president of the environmental protection group (*Schutzverband des Flughafen Zürich* or *SBFZ*). The burden of the *RT* could be divided into four phases (Schenkel and Wehrli, 2003).

In the first phase, the first meeting (May 12th, 1998) was conducted with four major stakeholder groups:

- Ten communities around Zurich Airport – Opfikon, Ruemlarg, Oberglatt, Klotten, Regensdorf, Buelach, Dietlikon, Weiach, Zurich, and Winterthur
- An environmental protection group (*SBFZ*)
- Director of Economics, Canton of Zurich
- Airport partners – Zurich Airport, Airport Real Estate Company (*Flughafen-Immobilien-Gesellschaft* or *FIG*), SwissControl (Air navigation services provider for Switzerland), and SAirGroup

Goals and objectives were set for the *RT* as the consultative organisation for noise protection and airport issues. In phase II, the scope of the RT was expanded to new stakeholders and affected communities. Also, the *RT* should work on finding resolutions without decision-making. A steering committee and two working committees (one of them, a transport committee) were set up to support the plenum. Processes in the first two phases required political support. Therefore, in phase III and IV, a political committee was established for working on political strategies.

In the RT's transport committee, transport plan-making was conducted by co-operation between the Canton Zurich's Department of Transport and the Department of Marketing and Planning for Landside Traffic of Zurich Airport Authority, with help from two transport expert companies (Prognos AG and Emch+Berger AG). This informal planning group met every month over a time frame of one year. The end-product of this informal procedure was a ground transport plan, as a part of the comprehensive plan for public vote. After approval by a public vote, Zurich Airport and the Canton of Zurich together developed a proposed working plan. Several policies, for example, the new central bus station and the limitation of new parking lots, were implemented. Form November to December 2000, the Airport Authority also worked with fifteen major companies, which were located on the airport, to create a co-operative plan for increasing the share of mass transit for airport employees.

3.4.7. Zentrum Zürich Nord

The Zentrum Zürich Nord or ZZN is the conversion of a large former industrial area into a mixed-use district in the north of the city. It is the largest downtown urban renewal project in Switzerland. This site is located in the immediate vicinity of one of the most important railway and rapid transit stations, right across the sub-centre Zurich-Oerlikon.

Project	Zentrum Zürich Nord
Location	Former industrial area in the north of the city
Project's data	High-tech industrial project with offices for 11,600 workplaces, a shopping centre, and residential units for 5,100 dwellers 4,000 parking spaces
Significance	Located on the heart of the 4-kilometre corridor of "Regional Center Areas" between the airport and Zurich Nord/Oerlikon
Accessibility	A20 and three arterial roads 6 Tram-lines with total of 450 trips daily
Project's elements on transport system	A couple bus lines A new tram line Increase share of public transport trips from 35% to 45% Increase share of pedestrian and bicycle trips from 10% to 25% Decrease share of private vehicle trips from 55% to 30%

Table 14: Data of Zentrum Zürich Nord

The project required large investments to be made on sixty-one hectares and included approximately 5,100 new inhabitants and 11,600 new workplaces. It represented a high-tech industrial project with offices, a shopping centre combined with residential units, as well as a large central open space and green space. Capacity of transport infrastructure around this project was already full, long before the project was initiated. Therefore, the new trips created by this project must mainly depend on public mass transit. This project proposed a couple of new bus-lines, and a new tram-line, with a target of increasing the share of public transport trips from 35% to 45% and pedestrian and bicycle trips from 10% to 25%. Consequently, the share of private vehicle trips would be decreased from 55% to 30% (Scholz, 1997).

The Canton of Zurich promoted the integration of transport and land-use in the four-kilometre long corridor between the airport and Zurich Nord/Oerlikon. The airport area and the Zentrum Zürich Nord were designated as Regional Center Areas in the spatial development plan of the Canton. In addition to the regional railway, a light-rail and an extended tramway line were planned to guarantee fine distribution and excellent accessibility throughout the corridor (Güller Güller architecture urbanism, 2001).

Formal procedure

In 1998, landowners of Oerlikon industrial area presented the development concept “Chance Oerlikon 2011” to the City of Zurich. They envisioned decreasing the existing industries, and suggested new service industries and mixed uses (between residential and commercial uses). The City of Zurich granted “Chance Oerlikon 2011” to be the structure concept for this city quarter. A design contest process began on February 1991 with forty architectural teams. The result was announced in October 1992, with the winning team of Ruoss, Siress, and Schrader.

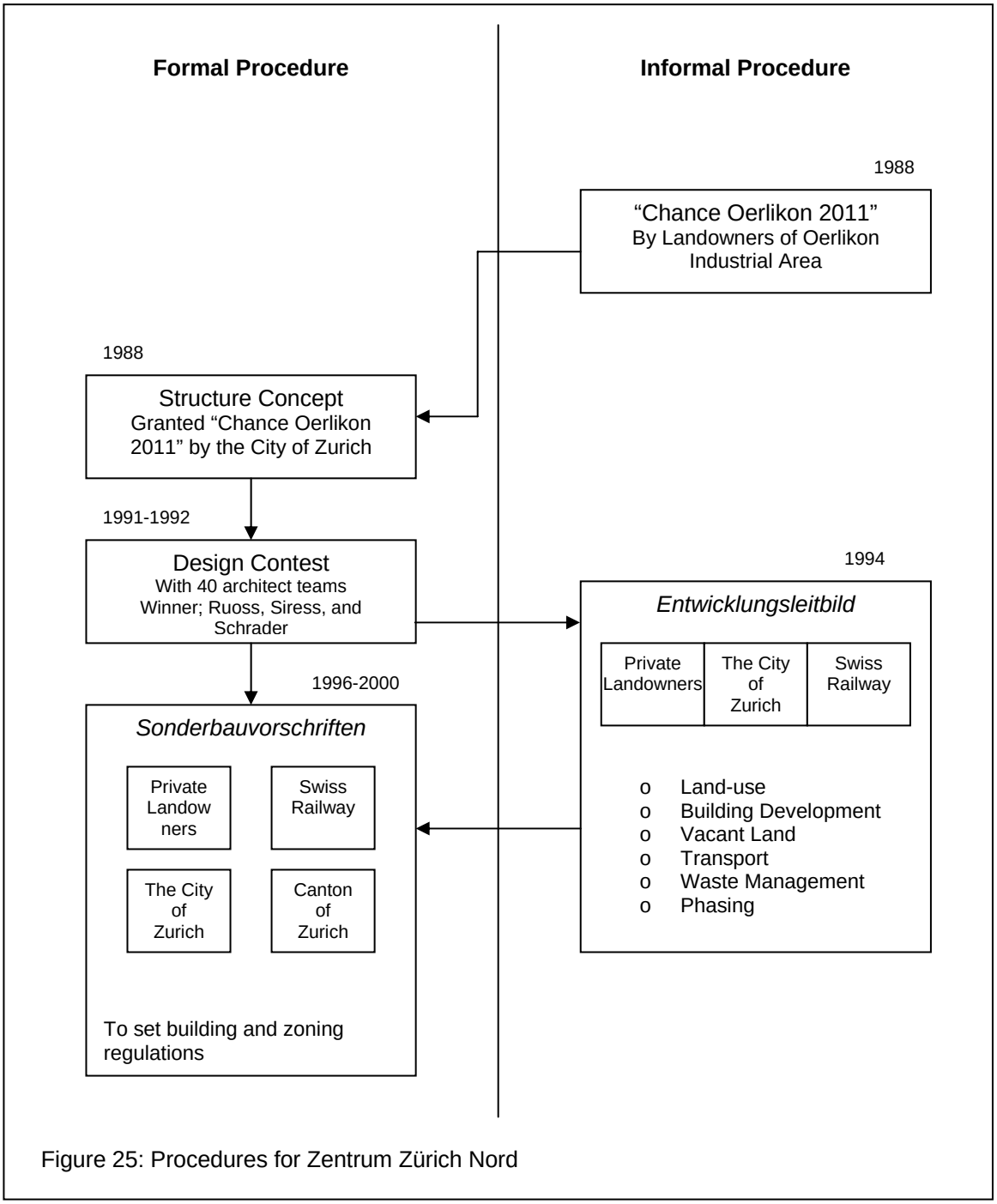


Figure 25: Procedures for Zentrum Zürich Nord

Following the *Entwicklungsleitbild*, the Canton of Zurich, the City of Zurich, private landowners, and SBB worked together on the formal procedure "*Sonderbauvorschriften* or *SBV*" (Special Building Regulations) for setting building and zoning regulations for the ZZN. The results from the *SBV* were formal regulations. Therefore, the stakes on the *SBV* were very high. The *SBV* was expected to be completed in 1997.

The transport system in ZZN had already reached its capacity before project ZZN was launched. From the mission statements indicated in the *Entwicklungsleitbild*, the *SBV* set the concept for optimising the existing transport system and keeping the impacts on the environment as low as possible. The additional trips, created by ZZN, should be taken by mass transit. Therefore, a couple of bus lines, a new tramline, and the limitation of 4,000 parking spaces were planned (Scholz, 1997).

However, private landowners protested on the limitation of parking spaces. They expressed their opinion that 4,000 parking spaces were not enough for their businesses. Moreover, it was not yet clear that, the City of Zurich or landowner would pay for the new expansion of the transport system in ZZN.

Informal procedure

From the concept of "Chance Oerlikon 2011"and the co-operation of private landowners, the City of Zurich and Swiss Railway (SBB), the development concept "*Entwicklungsleitbild*" (Development mission statements) was set as fundamental for the formal procedure "*Sonderbauvorschriften* or *SBV*". The tasks for *Entwicklungsleitbild* covered the concepts in six planning areas: land-use, building development, vacant land, transport, waste management, and phasing.

Regarding the transport aspect, the *Entwicklungsleitbild* proposed decreasing the share of private motor vehicle trips from 55% to 30%, and increasing of mass transit trips from 35% to 45% and pedestrian and bicycle trips from 10% to 25%. Also, the total number of 4,000 parking spaces was divided into 1,500 spaces for residents, 1,800 spaces for workers, and 700 for visitors. These guidelines were considered as the basis in formal planning in the *SBV* (Scholz, 1997).

3.5. Case Studies Analysis

The study of the seven case studies led to the conclusion that a formal procedure alone was not able to complete the goal of integrated planning of land-use and transport in airport regions. In each case study, an informal procedure was conducted as a supplementary instrument to eliminate these

deficiencies. However, the cooperation of a formal procedure and an informal procedure were still not able to provide full success.

Formal procedures are subjected to planning laws. With an arbitration formation, the responsible planning authority was the lone decision-maker in formal procedures. In contrast, formations of informal procedures were ranged from direct negotiation, facilitation, to mediation. Normally, an informal procedure was aimed to be the preliminary discussion forum and to provide the information for the decision-making process in a formal procedure. Therefore, informal procedures were usually processed before, or parallel to, formal ones. However, in some situations, for example the fifth runway project at the Amsterdam Airport, an informal procedure was started after the final decision-making in a formal procedure. In this case study, an informal procedure was applied in another direction. An informal procedure may also be used as a facilitation instrument for implementing the results from a formal procedure.

In some case studies, some relevant inputs were still missing in both formal and informal procedures. Some procedures were not able to precisely and exactly describe impacts of a proposed project on the transport system. The selected formation of a procedure was higher or lower than needs based on the intensity of conflict. Some formations did not gain satisfaction from stakeholders. Regional accessibility was always secured but, in some case studies, especially projects in airport regions, the consideration of an airport's accessibility was not included in their procedures. In most case studies, some stakeholders were not satisfied with the results coming from the procedures.

Even with the co-ordination of a formal procedure and an informal procedure, some stakeholders still did not have a chance to participate in any procedure. Some formations of a procedure were too complicated. Some stakeholders could not efficiently participate. In a couple of case studies, results caused conflicts after decision-making. Some case studies failed to use an appropriate report on their progress and results as a tool to communicate with non-participating stakeholders.

Some procedures required a large amount of budget and a lengthy process. With a large number of non-participating stakeholders, some required inputs were missing or needed budget and time for collecting. Doubts of the neutrality of third parties caused lengthy discussions and negotiations. Some projects were delayed because of the difficulties in reaching agreement among stakeholders, and, eventually, because of lawsuits. All formal procedures were ended after the approval or non-approval of the proposed

projects. Informal procedures should be able to continue for monitoring the projects and dealing with further conflicts. However, some informal procedures were terminated after the results were finalised.

The overviews of the implemented formal and informal procedures in each case study, discussed in this chapter, were the starting points for the assessment process in the following chapter.

4. Assessment of Planning Procedures

4.1. Introduction

This part of the study contains a discussion of the assessments of procedures used for integrated planning of land-use and transport which were already implemented in the case studies. It consists of sub-chapters which explain the assessment method and the interpretation of results.

Chapter 4.2, “Assessment Methods”, includes a discussion of five available assessment methods and criteria for selecting an appropriate assessment method that fitted the characteristics of the data to be evaluated. Moreover, the goal, objectives, and requirements of the assessment process were formulated as guidelines for assessing the efficiency of the procedure implemented in each case study.

Chapter 4.3, “Criteria and Indicators for the Assessment”, contains discussions of three groups of requirements of procedures for integrated planning of land-use and transport in airport regions which were initially discussed in chapter 2.3.3, and were analysed in terms of assessment scales.

Chapter 4.4, “Information Collection”, includes discussions of three available interview techniques, the targeted people for conducting interviews, and the limitations of interviews in this study. Also, the overall questionnaire contained three sets of questionnaires relative to the three objectives which were initially indicated in chapter 2.3.

Chapter 4.5 and 4.6, “Assessment of Particular Projects” and “Assessment of Project Locations”, contain a discussion of Goal-Achievement Matrices which were designed and processed to indicate the degrees of efficiency of implemented procedures for integrated planning of land-use and transport in airport regions. Each requirement in the set of goals outlined in chapter 2.3.3 was analyzed by means of Goal-Achievement Matrices. Two different approaches were applied for interpreting the results.

Chapter 4.7, “Results of the assessment process”, contains an interpretation of the results from chapter 4.6 in order to analyse the efficiency of the procedures implemented.

4.2. Assessment Methods

In order to evaluate the efficiency of the implemented procedures for integrated planning of land-use and transport, an appropriate, credible, feasible, and comprehensible assessment method was selected. In this study,

an appropriate assessment method should be able to evaluate the qualitative data on three different objectives. It should have the ability to present a comparison between the efficiency of the formal procedure alone and that of a formal procedure with the assistance of an informal procedure. Also, it should be able to precisely and clearly present the assessment results. The goal, objectives, and requirements on the assessment method were used to formulate guidelines for processing the selected assessment method in order to determine the capability of the implemented procedures regarding integrated planning.

4.2.1. Goals, Objectives, and Requirements of the Assessment Process

To determine the degree of efficiency of the implemented procedures of each case study, the assessment method should correspond to the goal of "*efficient assessment of procedures for integrated planning of land-use and transport in airport regions*". To achieve this goal, three objectives were proposed as follows:

- To enable an accurate and unbiased assessment process
- To conduct an understandable assessment process
- To optimise the assessment's cost effectiveness and time efficiency

Afterwards, three sets of requirements – in order to achieve each objective – were established by following the framework for processing assessment methods: inputs, operation process, and results (see Figure 26). This goal system was considered as a guideline for processing the selected assessment method.

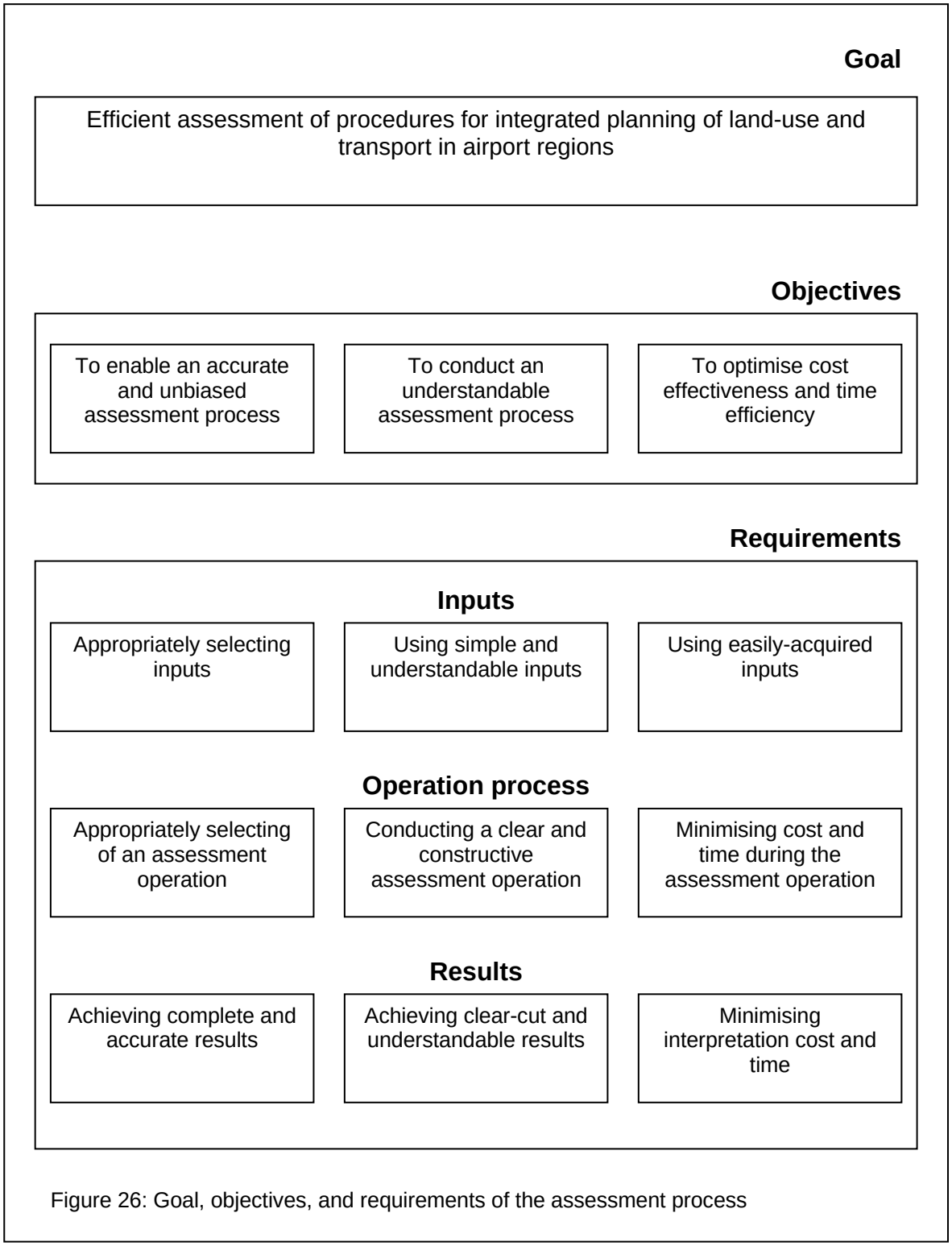


Figure 26: Goal, objectives, and requirements of the assessment process

4.2.2. Available Assessment Methods

Assessment is the systematic evaluation of the desired subjects. In theory, assessment is the rigorous, quantitative comparison of selected subjects. In practice, however, assessment could assume many forms. It might be informal as well as formal, and qualitative as well as quantitative. Kaiser et.al. (1995) explained five available assessment methods as follows:

- *Basic visual comparison* – in which two or more alternatives were proposed and assessed relative to each other. If alternative schemes were prepared with the same scale, the visual comparisons should be effective in conveying the major differences that resulted from the application of a particular alternative scheme. If well prepared, visual comparisons would be acceptable to non-professional audiences who would readily grasp the differences between visual images.

- *Numerical indicator and convenient checklists* – methods which presented a tabulation of outcomes or impacts according to goals and objectives. They were appropriate for comparing plan and development alternatives. If numerical measures were available or could be derived, then these indicators were effective comparison tools. They were feasible enough to be applied by general planning professionals, and often were compiled into conventional checklists.

Indicator	Plan A Impact	Plan B Impact	Target
Remaining agriculture land	250,000 acres; 60% of present	125,000 acres; 30% of present	Preserve 312,500 acres agricultural land: 75% of present supply
Trunk sewer extensions; amount and cost	4 miles; $1.2 million	8 miles; $2.4 million	Maximum of 5 miles length: $1.5 million total cost

Table 15: Illustrative numerical indicator targets (Kaiser et.al., 1995)

- *Goal-achievement matrices* – Measures of Effectiveness (MOEs) are criteria against which all alternatives were measured, and served as major links between technical analysis and the goals and/or objectives of decision-makers. To be used in the evaluation process, MOEs should exhibit six major characteristics, as follows (Meyer / Miller, 1984):

    - *Relevant to objectives*. Single-function model. Each MOE should be clearly related to an objective defined in the decision-making process.
    - *Measurable*. Data analysis techniques required to produce the necessary information for an MOE should be readily available, and the costs of data collection and analysis should be commensurate with the value of the information produced.

	Project 1	Project 2	Project 3	Project 4	…	Project N
Criterion 1						
Criterion 2						
Criterion 3						
Criterion 4						
…						
Criterion N						

Table 16: Goal-Achievement Matrices (Mayer / Miller, 1984)

- *Sensitive*. Each MOE should be specified at the level of detail and sensitivity to change appropriate for the decision being made. Measures might also pertain to various community groups likely to be impacted by the alternatives. This implied that different MOEs would likely be used at different scales of analysis, or in different operation environments.
- *Unbiased*. Measures should be applicable to a wide range of alternatives and should not favour one mode over another.
- *Manageable*. The number of measures used in the evaluation should be as small as possible and subject to the needs of decision-makers. Providing too much information was often as ineffective as not providing enough.

- *Single-function models* – displayed the interactions among factors related to a particular activity or function. A single model was appropriate for analysis of a particular function such as transport, land-use, storm water runoff, or air pollution. It would be an effective evaluation tool if the model was well-specified and included all of the relevant factors, relationships, and weights so that it accurately portrayed the workings of the functional system under various conditions.
- *Linked models* – brought together several individual models within a co-ordinated system in which the outputs of one model might become the inputs of another. Linked models were appropriate for use in evaluating comprehensive systems. They were effective if the factors and relationships were correctly specified, a more difficult task for linked than single models.

4.2.3. Criteria for Selecting the Assessment Method

In order to select an appropriate assessment method, five criteria were indicated – type of data, judgment method, expenditure on an assessment method, its accuracy and lack of bias, and its comprehension. In this study, most of the data to be assessed was expressed in qualitative terms by personal judgment. The selected assessment method should be able to process data with low expenditures of time and cost. It should be able to result in a high-accuracy and unbiased assessment. And, a comprehensive method was understandable and plausible to decision-makers and the public (Kaiser et.al. 1995). To illustrate the application of these criteria to the range of assessment methods available, Table 17 lists indicators to be considered in selecting an assessment method according to criteria as follows:

Criteria	Purposes of the study	Visual Comparison	Numerical Indicators or Convenient Checklists	Goal-Achievement Matrices	Single-Function Model	Linked Models
Data to be assessed	Qualitative	Qualitative	Qualitative/ Quantitative	Qualitative	Quantitative	Quantitative
Judgment methods	Personal	Personal	Personal/ Modelling	Personal/ Modelling	Modelling	Modelling
Expenditures of time and cost	Low	Low	Moderate	Low	High	High
Accurate and non-biased	High	Low	High	High	High	High
Comprehension	Simple	Simple	Simple	Simple	Complicate	Complicate

Table 17: Assessment method selection criteria

4.2.4. Results

The Visual Comparison method was able to assess qualitative data by personal judgments. This method was simple to process but it had shortcomings relative to its accuracy and bias. The Numerical Indicator or Conventional Checklists method was also simple and able to assess qualitative data by both personal and modelling judgements. With a high level of accuracy and non-bias, it required moderate time and cost. The Single-Functional Model and the Linked Models methods were considered as complicated ones. They were suitable to assess quantitative data and by modelling judgments. They were able to produce high accuracy and non-biased results with high expenditures. The Goal-Achievement Matrices

method was selected as the most appropriate assessment tool based on this study's purposes. With its simple procedure, it was able to process qualitative data by personal and modelling judgements. Also, it was able to make assessments with high accuracy and non-bias, and required low expenditures.

After the literature review and interviews, the criteria and indicators discussed in Chapter 4.3 were applied in the interpretation of responses from the questionnaire and information from other sources. The interpretation was based on the formulation of evaluation matrices. Then, the "radar graph" was selected to present the assessment results. The graph was divided into three sectors, following the three objectives of integrated planning. In each sector, requirements under the objectives were evaluated. Areas, covered by the ability of each selected procedure, represented its overall efficiency. The assessment process could be separated into three approaches: particular projects, projects' locations, and airport regions.

4.3. Criteria and Indicators for the Assessment

To assess the efficiency of procedures for integrated planning of land-use and transport in airport regions, the selected assessment method, Goal-Achievement Matrices, required criteria and indicators for each requirement. Consequently, questions were composed to investigate the level of achievement relative to each requirement.

The assessment process had to be consistent with the study's goal, objectives, and requirements contained in sub-chapter 2.3.3 (Figure 12). For this reason, criteria and indicators were formulated using the same format as the goal system, which was divided into three objectives: to enable high-quality results, to avoid conflicts among stakeholders, and to optimise cost effectiveness and time efficiency. In this study, the assessment scales ranged from + to -, relative to the ability in achieving the requirements of integrated planning.

To enable high-quality results

In order to achieve high-quality results, the procedure should be able to ensure accessibility by considering all relevant inputs and by exactly describing impacts on the transport system. Formations of the procedures should be suitable to conflict intensity among stakeholders. Also, results from the procedures should gain acceptance by stakeholders.

- *Considering all relevant inputs.* There were groups of stakeholders who were subjects in this study of interrelation of a proposed project and transport system, and they could be divided into two categories: key

stakeholders and affected stakeholders. The groups of key stakeholders were composed of decision-makers, a responsible planning authority, project owners or developers, and an airport authority. Affected stakeholders were companies affected by the impacts of projects, a Chamber of Commerce, citizen initiative groups, experts in related fields, and transport providers.

- Opinions/aims of all stakeholders were considered: +
- Opinions/aims of some affected stakeholders were missing: +/o
- Opinions/aims of all affected stakeholders were missing: o
- Opinions/aims of some of key stakeholders were missing: o/-
- Opinions/aims of all key stakeholders were not considered: -

- *Exactly describing the impacts.* To achieve this requirement, there were two criteria to be considered: investigators who studied the impacts and methods for investigation. Appropriate investigators should be the experts whose specific knowledge was accepted by all stakeholders. The investigation methods could range from individual judgment to complex modelling.
  - Investigated with complex modelling and by neutral experts: +
  - Investigated with complex modelling and by experts of a stakeholder: +/o
  - Investigated with simple modelling and by neutral experts: +/o
  - Investigated with simple modelling and by experts of a stakeholder: o
  - Investigated with opinions of experts: o/-
  - Investigated with individual judgment: -

- *Appropriately selecting the procedure.* Conflict intensity was the major factor for selecting the formation of the procedure. Also, satisfaction of stakeholders on the selected procedure was another factor in evaluating the efficiency of the procedure.
  - Ability of the selected formation was *fitted* to needs based on conflict intensity and *all* stakeholders were satisfied: +
  - Ability of the selected formation was *fitted* to needs based on conflict intensity and *most* stakeholders were satisfied: +/o
  - Ability of the selected formation was *either higher or lower* than needs based on conflict intensity and *all* stakeholders were satisfied: +/o
  - Ability of the selected formation was *either higher or lower* than needs based on conflict intensity and *most* stakeholders were satisfied: o

    - Ability of the selected formation was *fitted* to needs based on conflict intensity and *few stakeholders, or none*, were satisfied: -/o
    - Ability of the selected formation was *either higher or lower* than needs based on conflict intensity and *few stakeholders, or none*, were satisfied: -

- *Ensuring accessibility.* The results from the implemented procedure could be evaluated by their ability in ensuring accessibility in two areas: the whole region and the airport.
    - The results were able to ensure *both regional and the airport's* accessibility: +
    - The results were able to ensure *either regional or the airport's* accessibility: o
    - The results were able to ensure *neither regional nor the airport's* accessibility: -

- *Gaining acceptance by stakeholders.* Degree of acceptance of the results by the stakeholders was another requirement for assessing the efficiency of the implemented procedures.
    - The results were accepted by all stakeholders: +
    - The results were accepted by the majority of stakeholders: +/o
    - The results were rejected by the majority of stakeholders: o/-
    - The results were not completed because all stakeholders were not accepted: -

To avoid conflicts among stakeholders

To balance the conflicts of interest among stakeholders of projects in airport regions was one of the objectives of the planning procedures. Procedures were aimed to be opened to every stakeholder, processed with a fair and understandable procedure, avoided conflicts after decision-making, and appropriately reported on progress and results.

- *Opening for every stakeholder.* Degree of opportunity in participating in the procedures affected the efficiency of the implemented procedure. This criterion could range from fully limited to some stakeholders to widely open to every stakeholder.
    - The procedure was opened to every stakeholder: +
    - The procedure was limited to key stakeholders and some affected stakeholders: +
    - The procedure was limited to only key stakeholders: o

- The procedure was limited to some key stakeholders and some affected stakeholders: o/-
- The procedure was limited to only some key stakeholders: -

- *Processing with a fair and understandable procedure.* Ability in processing with an understandable method was one criterion in this requirement. Another one was the communication method. Through one-way communication, stakeholders could express their opinions, and the responsible bodies for those issues would decide on further solutions or omit them. On the other hand, two-way communication gave stakeholders the opportunities to discuss their interests.
  - Procedure was simple and easy to understand and proceeded with two-way communication: +
  - Procedure was quite understandable and proceeded with two-way communication: +/o
  - Procedure was simple and easy to understand and proceeded with one-way communication: o
  - Procedure was quite understandable and proceeded with one-way communication: o
  - Procedure was too complicate to understand and proceeded with two-way communication: -/o
  - Procedure was too complicate to understand and proceeded with one-way communication: -

- *Avoiding conflicts after decision-making.* Whether or not there would be conflicts after decision-making depended on the results from the implemented procedures.
  - Win/win results: +
  - Partly win/partly lose results without further conflicts: +/o
  - Partly win/partly lose results with further conflicts to be resolved: o
  - Win/lose or lose/win results: -/o
  - Lose/lose results: -

- *Appropriately reporting of progress and results.* Appropriate reports could help in communicating the progress and results of the implemented procedures to non-participating stakeholders. They also represented the transparency of the procedures and could be monitored by the public.
  - Public reports on both progress and results: +
  - Confidential reports on progress and public report on results: +/o
  - Confidential reports on both progress and results: o/-

- No reports: -

To optimise cost effectiveness and time efficiency

Appropriate budget and time consumed by implementing the procedures were other objectives of this study. Procedures should be able to minimise cost and time spent on the procedures themselves. Also, they should be able to help the overall procedures in optimising cost effectiveness and time efficiency by avoiding the causes of delaying the project. The continuation of the procedure could also help the project run efficiently.

- *Minimising cost and time of providing inputs.* This requirement relied on where the required inputs came from: direct from the participants, indirect, or no consideration. Cost and time of providing inputs could be minimised if stakeholders, who had those inputs, participated in the procedure.
  - All inputs came directly from participating stakeholders: +
  - Some inputs came indirectly from non-participating stakeholders: o
  - Inputs from non-participating stakeholders were not considered in the procedure: -

- *Minimising cost and time of processing a procedure.* Facilitation by third parties could help faster processing of the procedure. However, the neutrality of the third parties also had to be considered.
  - Neutral parties helped facilitating reaching an agreement: +
  - No facilitator, moderator, or mediator: o
  - One or some stakeholders served as the neutral party: -

- *Avoiding causes of delaying the project.* The intensity of conflicts after decision-making based on the results of the implemented procedure was another requirement for optimising cost effectiveness and time efficiency.
  - No conflict after decision-making: +
  - Mild conflicts, which could be resolved by an informal process: o
  - Major conflicts, which went to a formal resolution process: -

- *Enabling continuation of the procedure.* The continuation of the procedure affected the efficiency of implemented procedures. Procedures were expected to assist the projects until the projects were completed.
  - Permanent (forum and procedure were fixed and were continuous): +

- Temporary (forum and procedure were fixed, but were on a case-by-case basis): o
- Ad hoc (organized a forum and selected a procedure on a case-by-case basis): -

4.4. Information Collection

To collect the required data for assessment of procedures for integrated planning of land-use and transport in airport regions, interviews would be conducted. The available interview techniques were discussed. Then, the target interviewees were indicated for efficient further processing.

4.4.1. Selection Criteria

According to Meyer and Miller (1984), three interview techniques could be used to collect data – a personal interview, a telephone interview, and a mail survey.

- *A Personal Interview* is a technique that was most often used when new databases were being formed. The ability of the interviewer to explain questions, a longer time per interview (compared to other techniques), and higher response rates because of personal interaction made the personal interview a valuable technique in developing an extensive database. However, a personal interview is a particularly time-consuming and expensive technique which, given financial constraints on planning budgets, could become very difficult to undertake. From a methodological perspective, the possibility of biased results because of certain interviewer actions and statements was also a cause of concern. Even with these limitations, a personal interview was often the best way of getting the most complete information.

- *A Telephone Interview* has advantages over a personal interview in some aspects which included: (1) a shorter length of time required to complete each interview, (2) fewer people required to administer a survey, (3) the ability to supervise telephone interviews, and (4) the ability to easily re-contact those interviewees. The disadvantages related to the ability of those being called to easily refuse to respond to questions.

- *A Mail Survey* has an advantage due to the much-reduced cost of data collection, but disadvantages in terms of a potentially low response rate. Several special actions, however, have been shown to increase response rates, including mailing a second questionnaire or reminder to those interviewees who did not respond to the initial request within a

specified time period; pre-testing the questionnaire to avoid misleading or confusing questions; using a personally signed cover letter.

For this study, the preferred interview technique was a mail survey because most questions required time for finding the data for answering them. Also, most target interviewees were organisations with a number of staffs responsible for the project. Single individuals might not be able to answer all questions. These characteristics made a personal interview quite impossible. Telephone interview could be used later if there were detailed questions. Therefore, mail surveys, followed by telephone interviews, were selected for this purpose.

Limitations of interviews

Responses from the target interviewees were parts of the information for the assessment process. However, some questions might not be responded to the interviewees because of their personal reasons. Some questions were not liable to response by single interviewees because some target organisations divided their tasks into several departments. In some case studies, the procedures were dated back to 1988. The target interviewees, who used to take charge of the projects, no longer worked with the responsible organisations. Questionnaires might be forwarded to persons who have never taken part in the case studies. For these reasons, the other sources of information, e.g. text books, proceedings and reports on the selected procedures, journals, and websites, could provide the required information. These sources were also used for verifying some responses that came from individual judgments.

Target interviewees

There were a large number of affected stakeholders in each project in an airport region. It would have been very time-consuming and costly to interview all of them. Some stakeholders were directly involved, but some of them only monitored the progress of the project and would file protests if they felt that their interests might be harmed or omitted by the informal procedure. However, there were three important participants, namely the organisers of the informal procedure, a city or airport region planning authority, and an airport authority, which every project had in common. Those three participants were the targeted persons selected for conducting interviews.

- *Organiser of the informal procedure.* Organisers are people who knew everything that might happen using an informal procedure. They could provide crucial information about how the informal procedure was conducted, who were the conflicting parties, schedule, and time and

expenditures of the informal procedure. In some other case studies, organisers were experts from external companies, but, in some case studies, one of the participating stakeholders played this role.

- *City or airport region planning authority.* A city or airport region planning authority is the body who conducts the formal planning procedure for a project, and the progress and results of an informal procedure are the basis of their final decision. They also act as a representative of all citizens and groups in their governed boundary, as well as other stakeholders who decided not to participate in the procedures. Moreover, they represented the government on a national scale.

- *Airport Authority.* A representative of an airport authority was another crucial interviewee. The major concern of this study was to determine, by case studies how trips created or added affected an airport's accessibility and the ability of the procedures in ensuring that airport's accessibility. Therefore, the opinions of an airport authority in these case studies were of great concern.

Case studies were implemented by different procedures and depended on each region's planning system and regulations. Therefore, target interviewees were different case study-by-case study. The target interviewees[5] from each case study are presented in Table 18.

The lone interviewee for the project "fifth runway project at Amsterdam Airport" was a staff of the Province of North-Holland. In the planning procedures of this project, the Province served two positions; a neutral party and a responsible planning authority. The Province is also a key shareholder of Schiphol Airport. Therefore, this interviewee was able to provide the opinions of the airport authority. For the project "Amsterdam Zuid-As", a facilitator of the formal and informal procedures was a lone interviewee. The Airport Authority did not participate in the planning procedures. However, progress and results of this project were well documented. The planning forum still existed and was contactable. A couple of telephone interviews were also made.

For the "fourth runway project" at Frankfurt Airport, a facilitator of the informal procedure allowed a short personal interview and provided useful documents.

[5] Since planning in airport regions was considered as a sensitive issue, names and positions of the interviewees will not be disclosed. In this study, the interviewees were mentioned by their organisations.

An officer of the regional planning authority and a staff of the airport authority were also interviewed. Since this project drew significant attention from the public, progress and reports of the planning procedures were well documented. For the project “AirRail Center Frankfurt”, a facilitator of the informal procedure and a staff of airport authority were interviewed. The City Planning Authority did not participate in the informal procedure, but a short personal interview was conducted at the same time as the interview for the project “Europa-Viertel” was made. A staff of the facilitator organisation and the City Planning Authority was interviewed for the project “Europa-Viertel”. A staff of the airport authority declined to be interviewed for personal reasons.

Projects	**Organisation of target interviewees**		
	Organiser of the project	**Responsible planning authority**	**Airport authority**
Fifth runway project at Amsterdam Airport	Provincial Planning Authority		
Amsterdam Zuid-As	Facilitator of the formal and informal procedures	N/A	Not participate in the informal procedure
Fourth runway project of Frankfurt Airport	Facilitator of the informal procedure	Regional Planning Authority	Fraport AG
AirRail Center Frankfurt	Facilitator of the informal procedure	Not participate in the informal procedure	Fraport AG
Europa-Viertel	Facilitator of the informal procedure	The City of Frankfurt	N/A
Fifth expansion project of Zurich Airport	The City of Zurich		Zurich Unique Airport
Zentrum Zürich Nord	The City of Zurich		Not participate in the informal procedure

Table 18: Target interviewees

An interview was conducted with a staff of the City of Zurich, who served as a facilitator and a responsible planning authority for the “Fifth Expansion Project”. A staff of the airport authority was also interviewed. For the project “Zentrum Zürich Nord”, the interviewee was a staff of the city which served as a facilitator and a responsible planning authority. The Airport Authority did not participate in the procedures. Progress and results of this project were well documented.

4.4.2. Questionnaires

Questionnaires were designed as frameworks for identifying the required information for the assessment process. In this study, the questionnaires were categorised into three sets relative to the three objectives of planning procedures:

- to enable high-quality results

- to avoid conflicts among stakeholders
- to optimise cost effectiveness and time efficiency

However, it was not necessary to submit all questions to the target interviewees because some required information was already provided in relevant text books, journals and websites.

Objective "to enable high-quality results"

Required information in this category was principle concepts, structure, and formation of the procedures. Participants in the procedures, methods for investigation of the impacts, results, and the coordination of formal and informal procedures were also to be considered. Questionnaires in this category were:

Considering all relevant inputs

- What was the process for selecting the stakeholders to participate in this informal procedure?
- Were there any affected stakeholders who did not participate in this informal procedure? Why?
- What was the method for collecting opinions from the stakeholders who did not participate in this informal procedure?

Exactly describing impacts on a transport system

- Were there specific working groups on the interrelation of this project and its impacts on regional transport system?
- Who participated in this specific working group on the interrelation of this project and its impacts on the regional transport system?
- Who was the party responsible for investigating the impacts of the project on the transport system?
- What was the method for investigating the impacts?
- What types of impacts of the proposed project on the transport situation were brought into this informal procedure?

Appropriately selecting the procedure

- Why was this informal procedure and forum chosen?
- What was the structure of this forum?
- Did this informal procedure and forum satisfy the participants?
- Who were the neutral parties of this forum?
- What roles did the neutral parties play in this informal procedure?

Ensuring accessibility

- How in detail did the investigation of project's alternatives impact on the transport situation?
- What were the results of this informal procedure on the interrelation of the project and transport system?

- Based on your opinion, were the results from this informal procedure able to ensure regional accessibility?
- Based on your opinion, were the results from this informal procedure able to ensure airport's accessibility?

Gaining acceptance by stakeholders

- What were the alternative plans to mitigate conflicts among the stakeholders on the impacts of the proposed project on the transport system?
- How did formal planning agencies consider the results from the informal procedure?

Objective "to avoid conflicts among stakeholders"

Required information in this category was confidence in neutral parties, the fairness and understandability of the selected formation, the satisfaction of stakeholders on a procedure, and the reports of a procedure. Conflicts and ability of a procedure in dealing with them should also be included. Questionnaires in this category were:

Opening for every stakeholder

- What was the process for selecting the stakeholders to participate in this informal procedure?
- Were there any affected stakeholders who did not participate in this informal procedure? Why?
- What was the method for collecting opinions from the stakeholders who did not participate in this informal procedure?

Processing with a fair and an understandable procedure

- Were the participants confident of the neutral parties?
- Were the neutral parties affected by the results from the informal procedure?
- What was the method used to give the basic knowledge to the participants for effectively participating in this informal procedure?
- Did the participants understand the communication method of this informal procedure?
- Were there any difficulties for the participants with different backgrounds in adjusting themselves to participate in this informal procedure?

Avoiding conflicts after decision-making

- Were the participants satisfied by the results on the interrelation of this project and the transport system from this procedure?
- Which participants were not satisfied? Why were they not satisfied? How did they react?

- What were the instruments used within this informal procedure to satisfy the participants?
- Were there any protests or disputes against the results on the interrelation of the project and transport system from the informal procedure?
- Who were the stakeholders who protested against the results from the informal procedure? Why?
- What were the impacts of those protests on the project and the informal procedure?
- How were those after decision-making protests resolved?

Appropriately reporting on progress and results

- What types of reports on the progress and results of the informal procedure were selected?
- How often were the reports distributed? By which media?

Objective "to optimise cost effectiveness and time efficiency"

Required information in this category was time and cost spent on providing inputs, processing a procedure, and formulating results. The continuation of a procedure should also be included. Questionnaires in this category were:

Minimising cost and time of providing inputs

- How long was the expected time to be spent for this informal procedure?
- How many meetings did they hold as regular and private meetings?

Minimising cost and time of processing a procedure

- How long did the discussion and negotiation processes run?
- How long was the actual time spent on this informal procedure?
- Why was the actual time spent on the informal procedure higher (or lower) than expected?
- How long was the expected time spending for each step of the informal procedure?
- Why was the actual time spending on each step of the informal procedure higher (or lower) than expected?
- How much was the expected budget for the informal procedure?
- Where did the expenditure come from?
- How much was the actual expenditure for the informal procedure?
- Why was the actual expenditure on the informal procedure higher (or lower) than expected?
- How much was the expected budget for each step of the informal procedure?
- Where did the budget in each step come from?

- Why was the actual expenditure on each step of the informal procedure higher (or lower) than expected?

Avoiding causes of delaying the project

- With the assistance of the informal procedure, how long did the formal planning agencies expect their legal process to take?
- With the assistance of the informal procedure, how long did the formal planning actually take for their legal process?
- Why was the actual time spent by the formal planning agencies higher (or lower) than expected?

Enabling continuation of the procedure

- How much longer does this forum and informal procedure continue?
- Can this informal procedure be applied to the other projects in this airport region?

4.5. Assessment of Particular Projects

Formal and informal procedures implemented in the case studies produced different level of ability on integrated planning of land-use and transport. In this chapter, formal and informal procedures of each case study will be assessed.

4.5.1. Fifth Runway Project at the Amsterdam Airport

The formal procedure for the fifth runway project of Amsterdam Airport was considered as a national issue in the “Key Planning Decision” by the Department of Housing, Spatial Planning, and the Environment and the Department of Transport. This plan was the framework for the provincial plan of the Province of North-Holland and local plans of the related municipalities. CORUS was the informal organisation for this project. From 1996 to 2000, this informal organisation had worked on the co-ordination of a zoning plan, acquisition of land, noise insulation program, and compensation for damage.

Formal procedure

As it was conducted by national authorities with the assistance of provincial authorities and the airport authority, most opinions of affected stakeholders came indirectly through the government bodies. The impacts of the project were investigated by experts of the national authority. Conflict topics relative to this project were very complex, but the selected procedure was in arbitration formation with national planning authorities who served as the lone decision-maker. With national mainport status, accessibility, both regional and airport’s, was ensured. Most stakeholders agreed with this proposed project.

However, the procedures for “Key Planning Decision” and “Provincial Plan” were limited to only the key stakeholders. Discussion was about the technical

impacts of the new runway, and proceeded with two-way communication. With a limited number of participants, the results were in a win/lose situation. The results from this procedure were the regulations and framework for further provincial and municipal planning.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	o	+/o
	Exactly describing the impacts on transport system	+/o	+/o
	Appropriately selecting the procedure	o	+/o
	Ensuring accessibility	+	+
	Gaining acceptance by stakeholders	+/o	+/o
To avoid conflicts among stakeholders	Opening for every stakeholder	o	o
	Processing with a fair and understandable procedure	+/o	+
	Avoiding conflicts after decision-making	o/-	+/o
	Appropriately reporting of progress and results	+/o	+
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	o
	Minimising cost and time of processing a procedure	-	-
	Avoiding causes of delaying the project	o	+
	Enabling the continuation of the procedure	-	o

Table 19: Evaluation Matrix of the procedures for the fifth runway project at the Amsterdam Airport

In this formal procedure, inputs from non-participating stakeholders came indirectly through the participants. To some extent, national authority, who had high stakes in this project, played a moderator role. Mild conflicts were left to its informal procedure “CORUS”. After completing the “Key Planning Decision”, this formal procedure no longer existed.

Formal procedure with the assistance of CORUS

Although more participants were in CORUS than those in the formal procedure, some groups of affected stakeholders did not have the opportunity to participate. The province of North-Holland, who investigated the project’s impacts, acted as the chairman and neutral party. Ability of facilitation was lower than conflict intensity, but it satisfied most stakeholders. The results

from CORUS were able to ensure accessibility for the province of North-Holland and Schiphol Airport. Most stakeholders were satisfied by the results from CORUS.

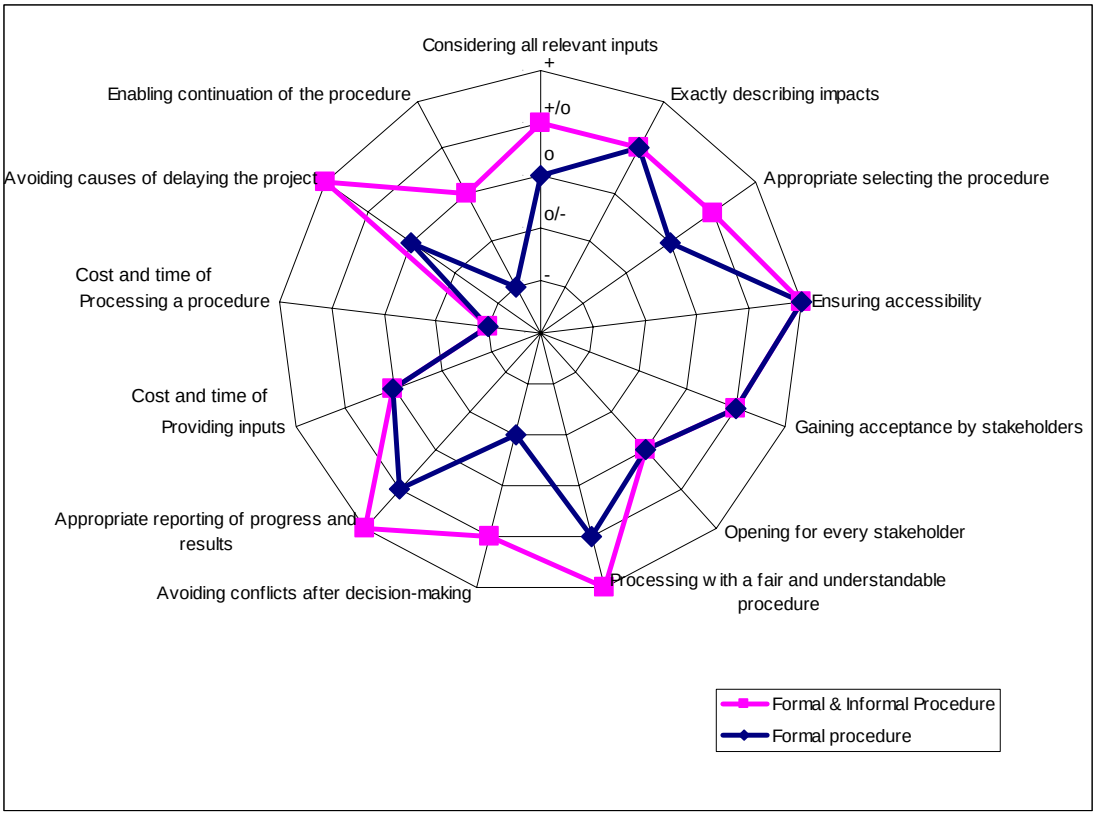


Figure 27: Efficiency of the procedures for the fifth runway project at the Amsterdam Airport

CORUS was limited to the key stakeholders and some affected stakeholders. With two-way communication, the process of the procedure was understandable for all participants. The results from CORUS were in a partly win/partly lose situation without further conflict. The results were published, but few non-participating stakeholders were interested in the publication.

With some missing affected stakeholders, the required inputs came indirectly through the participants. The Province of North-Holland played the neutral party role, but they held stakes in this project. There was no major conflict left after the ending of CORUS in 2000.

Summary on the assessment of the implemented procedures

The formal procedure for this project was already able to moderately achieve the goal of integrated planning. It could achieve rather high-quality results and moderately avoid conflicts among stakeholders. However, its ability in optimising cost effectiveness and time efficiency was quite low. With assistance for the procedure from CORUS, it could moderately help increase

to avoid conflicts among stakeholders. CORUS could merely help increase the ability in enabling high-quality results because those of the formal procedure alone were already quite high. However, CORUS could not provide much help on the shortcomings of the formal procedure in optimising cost effectiveness and time efficiency because the formal procedure was already finished before the beginning of CORUS.

4.5.2. Amsterdam Zuid-As

The formal procedure for project Amsterdam Zuid-As was conducted by Zuidas Management Consultative Committee (*Bestuurlijk Overleg Zuidas* or *BOZ*). Zuidas Coalition was the informal organisation to determine the agreements among stakeholder. Those agreements were the crucial inputs for *BOZ*.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	o/-	o/-
	Exactly describing the impacts on transport system	+/o	+
	Appropriately selecting the procedure	o	+/o
	Ensuring accessibility	o	o
	Gaining acceptance by stakeholders	+/o	+/o
To avoid conflicts among stakeholders	Opening for every stakeholder	o/-	+
	Processing with a fair and understandable procedure	+	+
	Avoiding conflicts after decision-making	-	-
	Appropriately reporting of progress and results	+/o	+/o
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	+
	Minimising cost and time of processing a procedure	-	-
	Avoiding causes of delaying the project	-	-
	Enabling the continuation of the procedure	-	+

Table 20: Evaluation Matrix of the procedures for Amsterdam Zuid-As

Formal procedure

In the *BOZ*, the airport authority – a key stakeholder – did not participate. Impacts of Amsterdam Zuid-As were investigated by experts of the city

planning authority. The formation of “arbitration” with two-way communication was lower than the high conflict intensity. Without the participation of the airport authority, the results from the *BOZ* would be able to ensure only regional accessibility. The results gained acceptance by the majority of stakeholders.

The *BOZ* was limited to only three groups of stakeholders. Discussion and negotiation among the government agencies allowed for an understandable procedure. The results of the *BOZ* was in a win/lose situation, and the losers filed lawsuits which caused at least a one-year delay to the project. The result from the *BOZ* was a master plan with a vision of the whole project’s areas, and it was presented to the public.

This formal planning organisation was temporary, with a one-year timeframe. Composed of only three participants, the *BOZ* had to use some indirect inputs. The *BOZ* was moderated by a stakeholder – the provincial planning authority. Some stakeholders filed lawsuits against the results from the *BOZ*.

Formal procedure with the assistance of the Zuidas Coalition

The Zuidas Coalition was composed of several participants, including participants of the *BOZ*. However, the airport authority did not take part in this procedure. Impacts of the project were investigated by the responsible planning authority, the same as that of the *BOZ*. The formation of “Facilitation” was suitable for the project’s high conflict intensity. The results were considered relative to regional accessibility and received acceptance by the majority of stakeholders.

Although the Zuidas Coalition was opened to every stakeholder, the airport authority did not take the chance to participate. Facilitation formation made the procedure fair and understandable. However, the results were still in a win/lose situation. The Zuidas Coalition submitted its confidential reports to the *BOZ*.

With a large number of participants, all required inputs came directly. However, a stakeholder – the City of Amsterdam – played the neutral party role. The Zuidas Coalition was not able to eliminate the conflicts that caused the delays in the project. This informal organisation was expected to be ongoing until the end of the whole project in 2030.

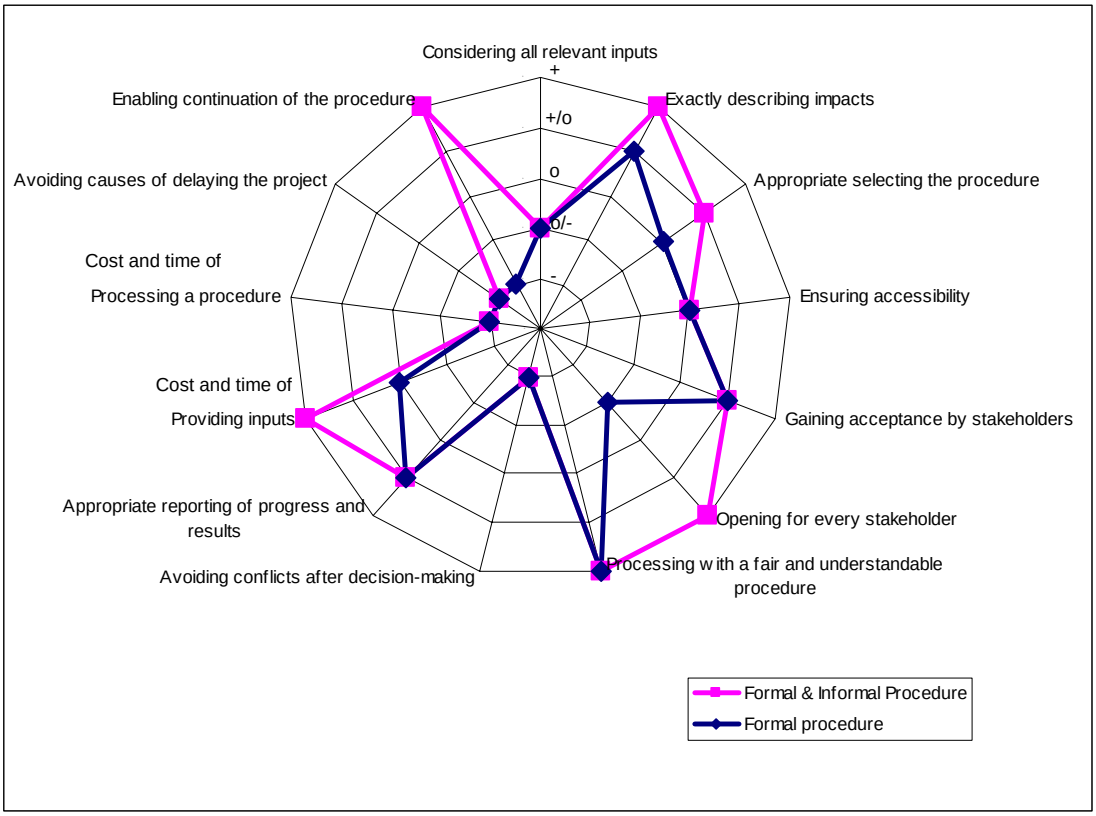


Figure 28: Efficiency of the procedures for Amsterdam Zuid-As

Summary on the assessment of the implemented procedures

The formal procedure of this project – the *BOZ* – was able to generate moderate quality results. However, it failed to avoid conflicts among the stakeholders which led to a large amount of budget and a lengthy process. Unfortunately, its informal procedure – Zuidas Coalition – was not able to eliminate the weaknesses of the *BOZ* in avoiding conflicts among stakeholders and optimise cost effectiveness and time efficiency. The Zuidas Coalition could provide only minor assistance in all three objectives.

4.5.3. Fourth Runway Project at the Frankfurt Airport

The *Raumordnungsverfahren (ROV)* was a formal procedure for assessing the significance of this project on a regional scale. The *Planfeststellungsverfahren* or *PFV*, the following procedure after the *ROV*, was to apply for a building permit for special projects like the new runway. The *Mediationsverfahren* was initiated for studying proposals for managing the increasing air transport demands at Frankfurt Airport. The Regional Dialog Forum or RDF, the successor to the Mediation Procedure, was organised because of the airport expansion's problems.

Formal procedure

The participation process in the *ROV* and *PFV* tried to consider the opinions of all stakeholders. However, the opinions of non-participating stakeholders could be considered only by an indirect way. Impacts of the project were investigated by the experts of the planning authority. Although most stakeholders were satisfied with this procedure, the formation of "Arbitration", in which the planning authority was the decision-maker, was not fitted to the conflict's intensity. The *ROV* and *PFV* considered accessibility on a regional scale, and the results were accepted by the majority of stakeholders.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	+/o	+
	Exactly describing the impacts on transport system	+/o	+
	Appropriately selecting the procedure	o	+/o
	Ensuring accessibility	o	+
	Gaining acceptance by stakeholders	+/o	+
To avoid conflicts among stakeholders	Opening for every stakeholder	+	+
	Processing with a fair and understandable procedure	+/o	+
	Avoiding conflicts after decision-making	o/-	+/o
	Appropriately reporting of progress and results	+	+
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	+
	Minimising cost and time of processing a procedure	-	+
	Avoiding causes of delaying the project	o	+
	Enabling the continuation of the procedure	-	+

Table 21: Evaluation Matrix of the procedures for the fourth runway project at the Frankfurt Airport

The general public hearing in the *ROV* and *PFV* was opened to every stakeholder. The public hearings were quite understandable and proceeded with two-way communication. Since the decision was made by the responsible planning authority, the results were in a win/lose situation. The results were the expansion plans, with permission for construction of the new runway, which were distributed to the stakeholders.

There were some stakeholders who did not participate in the *ROV* and *PFV*. Consequently, some of their opinions were missing. Planning authorities of the *ROV* and *PFV* were the decision-maker and the facilitator of the public hearing. The conflicts on the noise and environmental problems were still unsolved, but the conflicts on transport system were just minor concerns. The *ROV* and *PFV* were processed until the results, which were indicated in planning regulations, were completed.

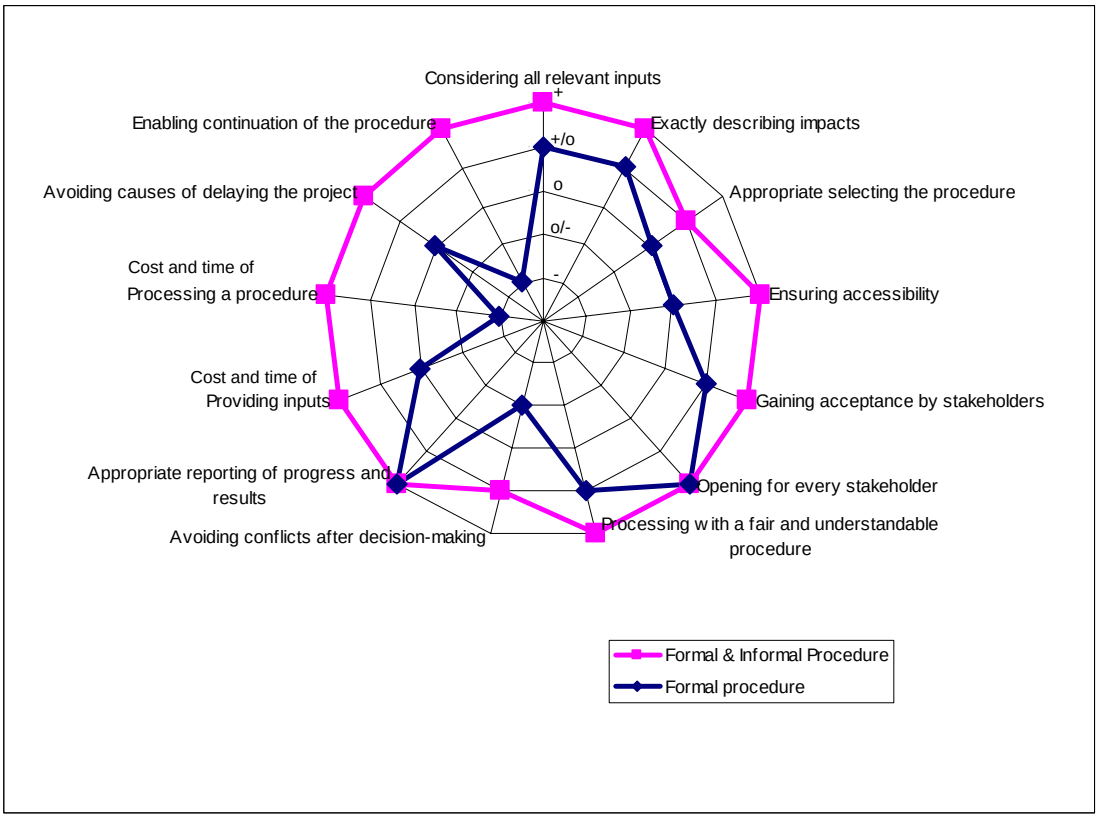


Figure 29: Efficiency of the procedures for the fourth runway project at the Frankfurt Airport

Formal procedure with the assistance of the *Mediationsverfahren* and the Regional Dialog Forum

With the assistance of the *Mediationsverfahren* and the Regional Dialog Forum (RDF), all relevant inputs were considered. A number of neutral experts were invited to investigate the project's impacts with complex transport models. The formation of "Mediation" was appropriate to the conflict intensity, and all stakeholders were satisfied with the method. In the informal procedure, both regional and the airport's accessibility were ensured. There was no protest of the results on ground accessibility aspects, but suitable solutions for conflicts on economic and environmental aspects were still not resolved.

The *Mediationsverfahren* and the RDF invited the relevant stakeholders to join their organisations. However, the environmental groups decided not to participate. The moderators arranged several private meetings with some stakeholders to make them efficiently participate in the two-way communication procedure. On the ground accessibility aspect, the results were partly win/partly lose without further conflict. The results were published in documents and on websites as well.

Some stakeholders, who did not participate in the *Mediationsverfahren* and the RDF, decided to take part in public hearings of the formal procedures. In these informal procedures, the mediators and neutral experts helped to facilitate reaching an agreement. There was no further conflict after decision-making on the ground accessibility aspect. After the ending of the *Mediationsverfahren* in 2000, the RDF was organised to continue the process and to monitor the airport expansion project.

Summary on the assessment of the implemented procedures

The *ROV* and *PFV* were able to create moderate-quality results. They could have avoided some conflicts among stakeholders, but the unresolved conflicts might have caused a large amount of budget and delays of the project. With the assistance of the *Mediationsverfahren* and RDF, all three objectives were effectively supported, especially in optimising cost effectiveness and time efficiency. However, ground accessibility was considered as a minor issue in the new runway project at Frankfurt Airport. Conflicts between economic and environmental aspects were the major concerns. If there were agreements on these major conflicts, it was accepted that ground access infrastructure would be designed for supporting those agreements.

4.5.4. AirRail Center Frankfurt

The formal procedure for the AirRail Center Frankfurt was the building permission procedure under Section 34 of the *Baugesetzbuch* (*BauGB*), conducted by the City of Frankfurt. The informal procedure "*Lenkungsausschuß*", which was composed of the land owner, the building owner, and the project operator, was set up to find a resolution of problems for stakeholders. The three participants created the proposal and always asked for the comments from planning authorities in related aspects.

Formal procedure

Under the *BauGB*, the opinions of all stakeholders had to be considered. However, there were some stakeholders who did not participate in the public hearing. The experts of the City of Frankfurt investigated the project's impacts on the transport system. The formation of "Arbitration" was inappropriate to

the needs based on conflict intensity. The results from this formal procedure could ensure regional accessibility. They gained acceptance by the majority of stakeholders.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	+/o	+/o
	Exactly describing the impacts on transport system	+/o	+
	Appropriately selecting the procedure	o	+
	Ensuring accessibility	o	+
	Gaining acceptance by stakeholders	+/o	+/o
To avoid conflicts among stakeholders	Opening for every stakeholder	+	+
	Processing with a fair and understandable procedure	+/o	+
	Avoiding conflicts after decision-making	o/-	+/o
	Appropriately reporting of progress and results	+/o	+/o
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	o
	Minimising cost and time of processing a procedure	-	+
	Avoiding causes of delaying the project	-	o
	Enabling the continuation of the procedure	-	+

Table 22: Evaluation Matrix of the procedures for AirRail Center Frankfurt

Public participation under the *BauGB* was opened to every stakeholder. The regular public hearing was quite understandable. Like the other general formal procedures, the results in this formal procedure were decided by the responsible planning authority and was in a win/lose situation. The results were documented in confidential reports attached to the building permit.

In the formal procedure, the City of Frankfurt served as the representative of non-participating stakeholders, but some opinions were missing. The City of Frankfurt was the decision-maker and also acted as a moderator. AirRail Center Frankfurt led to conflicts on economic aspects because it was considered as the major competitor to the business centre in the city. The formal procedure was ended after the proposed project was approved.

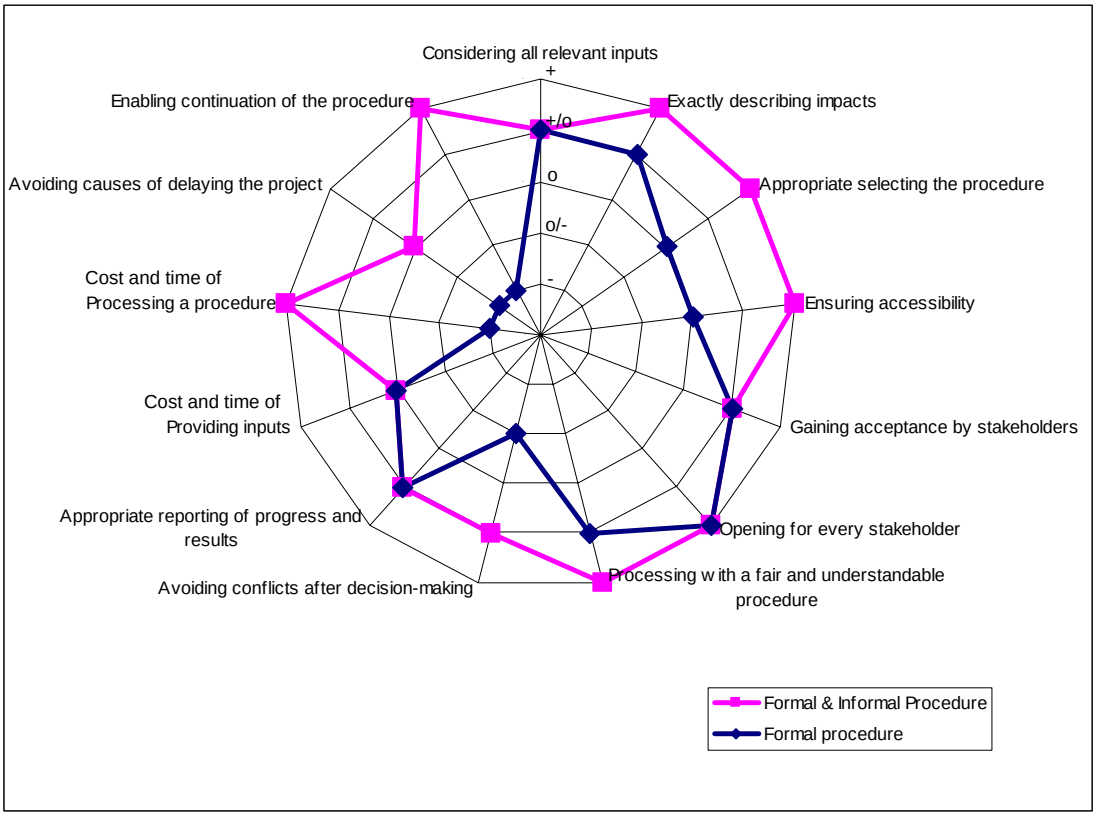


Figure 30: Efficiency of the procedures for AirRail Center Frankfurt

Formal procedure with the assistance of the *Lenkungsausschuß*

Although with the assistance of the *Lenkungsausschuß*, some inputs from non-participating stakeholders were still missing. The Dipole Study by ZIV applied complex transport models for investigation of the project's impacts. The ability of the facilitation formation combined with a public hearing on the formal procedure, fitted needs based on conflict intensity and all stakeholders were satisfied. The results based on the Dipole Study ensured the airport's accessibility, and the formal procedure provided for regional accessibility efficiently. The results were accepted by the majority of stakeholders.

The formal procedure allowed all stakeholders to participate and the *Lenkungsausschuß* initiated the preliminary discussion between the project's responsible bodies and the planning authority. The formation of facilitation of the informal procedure and the character of a public hearing made the procedure quite understandable. The results could help in mitigating conflicts between project developers and the city. However, progress and results were documented in the form of confidential reports.

The *Lenkungsausschuß* was composed of only three key stakeholders. Another key stakeholder – a city planning authority – was missing form this informal procedure. The other stakeholders had to use the public hearing, by

formal procedure, to express their opinions. A professional facilitator helped in reaching agreements in the informal procedure. Minor conflicts could be solved in the *Lenkungsausschuß*. The informal procedure would be processed until the construction of the project was complete.

Summary on the assessment of the implemented procedures

The formal procedure under the *BauGB* alone contributed moderate quality results. It helped in avoiding some conflicts among stakeholders. However, it still had main shortcomings on optimising cost effectiveness and time efficiency. With the assistance of the *Lenkungsausschuß*, the major increase was on the ability in optimising cost effectiveness and time efficiency. Also, the results were increased to a high-quality level. Ability in avoiding conflicts among stakeholders was also increased to a relatively high level.

4.5.5. Europa-Viertel

The City of Frankfurt employed a project-based binding land-use plan (*Bebauungsplan Nr.826*) to determine the admissibility of this development project. Therefore, the Europa-Viertel and its infrastructure became an integral part of the formal procedure in the process for approving the *Bebauungsplan*. The informal procedure "*Aktionsplan integrale Verkerhskonzeption*" (Action plan of integrated transport concept) was aimed at the design of an appropriate ground access plan for the project. The results from this informal procedure were parts of a plan for applying for approval for its *Bebauungsplan*.

Formal procedure

There were two public hearings in the procedure for approving the *Bebauungsplan*: the preliminary hearing before processing a draft plan, and the hearing after the presentation of a proposed plan. However, opinions of some affected stakeholders were still missing. The experts of the City of Frankfurt applied complex transport models for investigating the project's impacts on transport system. The formation of "Arbitration" was higher than the needs based on conflict intensity. The results from this formal procedure could ensure regional accessibility. They gained acceptance by the majority of stakeholders.

The two public hearings in the formal procedure were opened to every stakeholder, but some stakeholders did not participate. The regular public hearing was quite understandable with a two-way communication process. Like the other general formal procedures, the results, decided by the responsible planning authority, were in a win/lose situation. The results were confidential reports attached to the *Bebauungsplan*.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	+/o	+
	Exactly describing the impacts on transport system	+/o	+
	Appropriately selecting the procedure	+/o	+
	Ensuring accessibility	o	+
	Gaining acceptance by stakeholders	+/o	+
To avoid conflicts among stakeholders	Opening for every stakeholder	+/o	+
	Processing with a fair and understandable procedure	+/o	+
	Avoiding conflicts after decision-making	o/-	+/o
	Appropriately reporting of progress and results	+/o	+
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	+
	Minimising cost and time of processing a procedure	-	+
	Avoiding causes of delaying the project	o	o
	Enabling the continuation of the procedure	-	o

Table 23: Evaluation Matrix of the procedures for Europa-Viertel

There were opinions from some stakeholders that were missing, and the City of Frankfurt could not effectively be their representative. The procedure for approving the *Bebauungsplan* was organized and facilitated by the City of Frankfurt, who was also affected by this project. By the nature of the procedure for approving the *Bebauungsplan*, some conflicts would be unresolved and brought into a further resolution process in the informal procedure. This procedure for approving the *Bebauungsplan* was ended after the final decision was made.

Formal procedure with the assistance of the procedure for *Aktionsplan integrale Verkerhskonzeption*

With the assistance of the procedure for the *Aktionsplan integrale Verkerhskonzeption*, all relevant inputs from every stakeholder were considered. In this informal procedure, neutral transport experts were invited to investigate the impacts of the Europa-Viertel on the transport system. With the participation of all groups of stakeholders, including a representative of

Fraport AG, both regional and the airport's accessibility were ensured. The results were accepted by all stakeholders.

Since the formal procedure for approving the *Bebauungsplan* was opened to every stakeholder, the procedure for *Aktionsplan integrale Verkerhskonzeption* brought the important stakeholders together to discuss their conflicts of interests. With the formation of "Facilitation", this informal procedure was fair and understandable. The results were in a win/win situation, and they were published as confidential reports attached to the application for the *Bebauungsplan*.

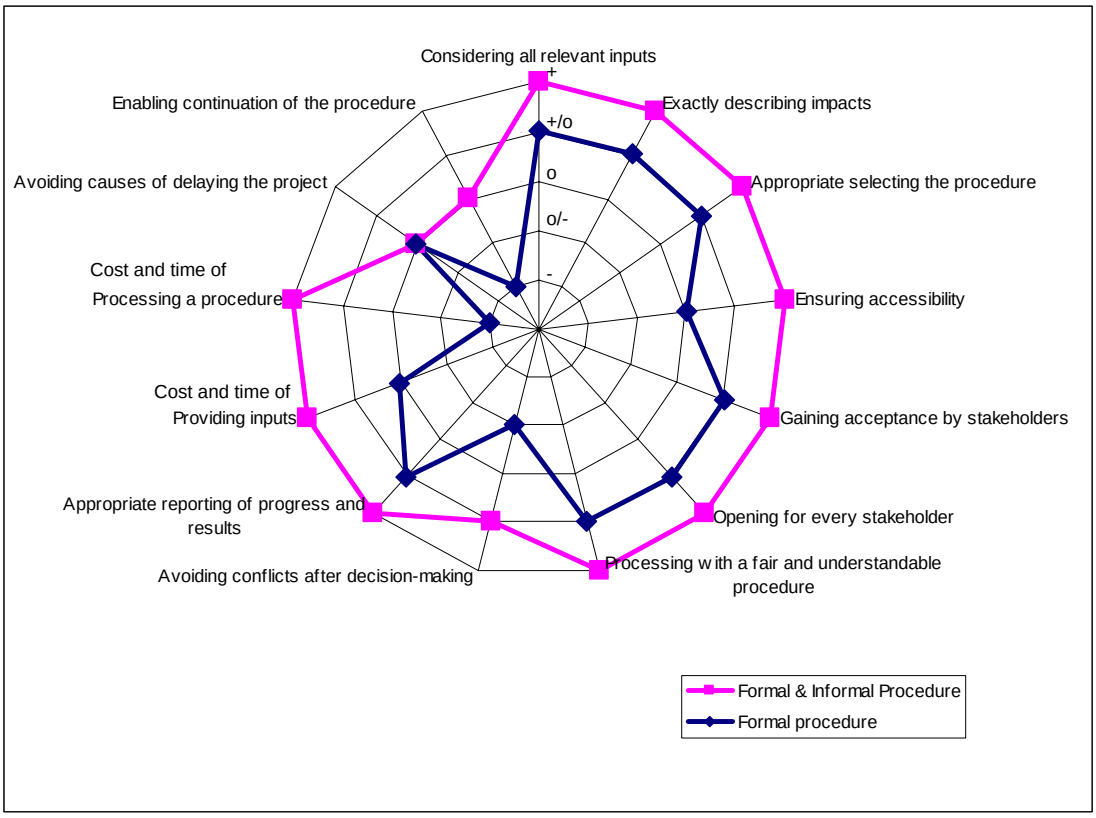


Figure 31: Efficiency of the procedures for Europa-Viertel

The procedure for the *Aktionsplan integrale Verkerhskonzeption* included all important stakeholders. The other stakeholders had to use the public hearing under the formal procedure to express their opinions. The professional facilitators served as a neutral party and facilitated reaching agreements. However, the procedure for the *Aktionsplan integrale Verkerhskonzeption* would be extended for one more year. The results from this informal procedure were a part of the application for approving the *Bebauungsplan*.

Summary on the assessment of the implemented procedures

The formal procedure for approving the *Bebauungsplan* alone was able to create moderate quality results and in avoiding conflicts among stakeholders. However, its ability in optimising cost effectiveness and time efficiency was still at a low level. The presence of the informal procedure for the *Aktionsplan integrale Verkerhskonzeption* could achieve high-quality results and a high level of ability in avoiding conflicts among stakeholders, but the informal procedure needed a one-year extension. The ability in optimising cost effectiveness and time efficiency was also affected by this extension.

4.5.6. Fifth Expansion Project at the Zurich Airport

The concept for the expansion of Zurich Airport was indicated in the national and cantonal plans. The formal planning procedure for the fifth expansion project of Zurich Airport was decided by a Cantonal public vote in 2000. The *Runder Tisch Flughafen Zürich* was set up as the informal procedure to cooperate with the cantonal planning authority. A transport working committee was formed to provide for efficient ground accessibility to the airport. Results from this committee were parts of proposed plan for the Cantonal public vote.

Formal procedure

The fifth expansion project was subject to approval by the Canton's population by a public vote. The citizens who came to vote did not have the opportunity to express their opinions in the voting system. In the Cantonal plan-making process, only the opinions from key stakeholders were considered. The experts of the Cantonal planning authority investigated the impacts of the project by use of complex transport models. The formation of "Arbitration" – all cantonal citizens made the decision – was not fitted with its conflict intensity, but most stakeholders were satisfied. In the Zurich Cantonal Plan, both regional and the airport's accessibility were ensured. The results were accepted by the majority of stakeholders.

Public vote was opened to every stakeholder. The voting system was very simple and understandable, but it was one-way communication. Stakeholders did not have any chance to share their opinions on the plan-making process for application in the voting system. Also, the results were in a win/lose situation. Based on the approval from 66% of the Zurich Cantonal citizens, it could be implied that the other 34% who did not approve this proposed project were the losers. The result was the airport's expansion plan, which was presented to the public.

In the Cantonal plan-making, some inputs from non-participating stakeholders were missing. There was no third party in the voting system. Every

stakeholder had an equal chance to make a decision on the proposed project. The nature of a voting system can absolutely avoid conflicts after decision-making and causes for delaying the project. This formal procedure was finished after the voting results came out.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	o	+
	Exactly describing the impacts on transport system	+/o	+
	Appropriately selecting the procedure	o	+/o
	Ensuring accessibility	o	+
	Gaining acceptance by stakeholders	+/o	+/o
To avoid conflicts among stakeholders	Opening for every stakeholder	+	+
	Processing with a fair and understandable procedure	o	+
	Avoiding conflicts after decision-making	o/-	o/-
	Appropriately reporting of progress and results	+/o	+/o
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	+
	Minimising cost and time of processing a procedure	o	+
	Avoiding causes of delaying the project	+	+
	Enabling the continuation of the procedure	-	o

Table 24: Evaluation Matrix of the procedures for the fifth expansion project at the Zurich Airport

Formal procedure with the assistance of *Runder Tisch Flughafen Zurich*

The *Runder Tisch Flughafen Zürich* was aimed at being a consultative organisation for the fifth expansion project. All groups of stakeholders participated in this informal procedure. In the transport working committee, neutral experts took charge in investigating the impacts of the project with complex transport models. The formation of “Facilitation” was fitted to its conflict intensity and achieved satisfaction for most stakeholders. Results from the transport working committee were able to ensure both regional and the airport’s accessibility. The results – as a part in the proposed plan for a public vote – were accepted by the majority of stakeholders.

The voting system was already opened to all stakeholders, and the *Runder Tisch Flughafen Zürich* brought all important stakeholders together to discuss the proposed plan for a public vote. The discussion method of “Facilitation” in *Runder Tisch Flughafen Zürich* was understandable with two-way communication. However, the results, subjected to a pubic vote system, were still in a win/lose situation. The results were presented to the citizens as the information for a public vote.

All groups of stakeholder participated in the *Runder Tisch Flughafen Zürich*. Therefore, all required inputs came directly from them. The external experts helped to facilitate reaching agreements. Potential causes of delaying the project were eliminated by the vote system. The informal procedure for *Runder Tisch Flughafen Zürich* was processed until the project proposal was submitted to a public vote.

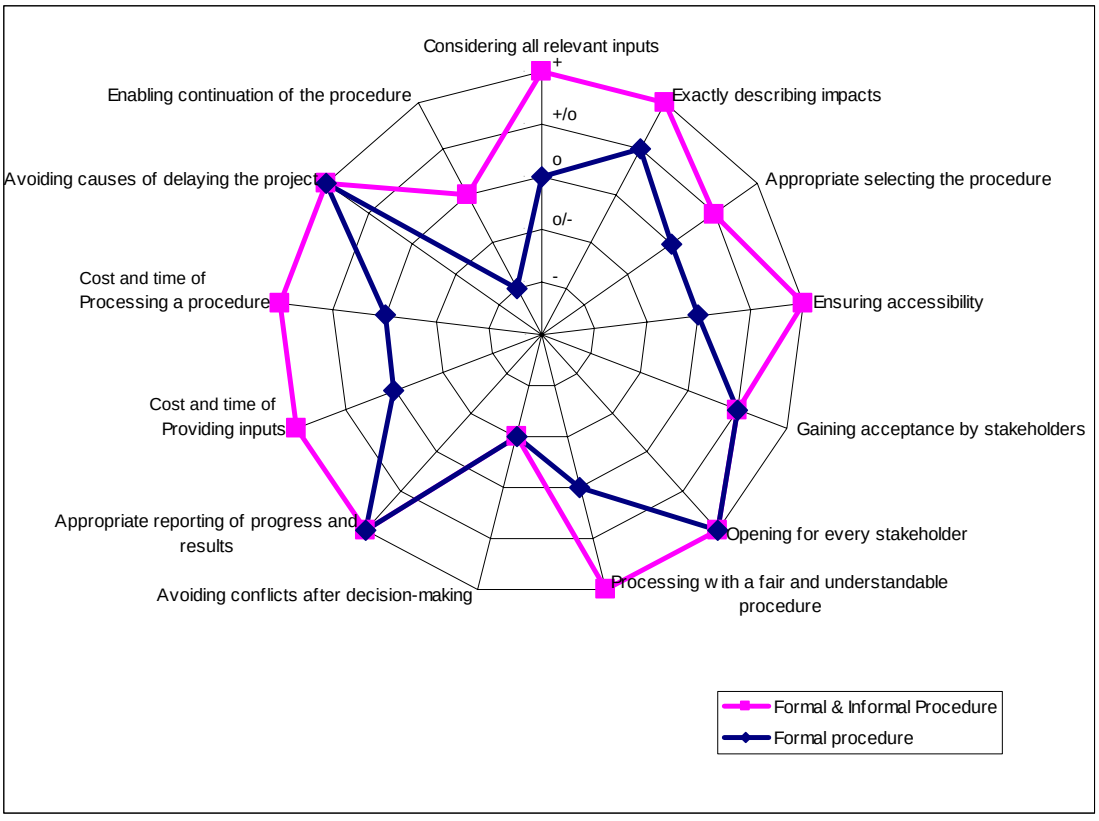


Figure 32: Efficiency of the procedures for the fifth expansion project at the Zurich Airport

Summary on the assessment of the implemented procedures

The formal procedure for the fifth expansion project at the Zurich Airport was able to create moderate quality results. Because of the nature of a public vote system, its ability in avoiding conflicts among stakeholders and optimising cost effectiveness and time efficiency were also at moderate levels. However, the opinions of citizens who did not approve of this project were not considered.

With the assistance of the procedure for *Runder Tisch Flughafen Zürich*, the ability in enabling high-quality results and optimising cost effectiveness and time efficiency were increased to high levels. However, its ability in avoiding conflicts was still at a moderate level because the nature of a public vote system was not concerned with the opinions of the minority voters.

4.5.7. Zentrum Zürich Nord

The Canton of Zurich selected the area of Zentrum Zürich Nord as one of their five main Center Areas. A formal procedure for Zentrum Zürich Nord was conducted by the procedure for the *Sonderbauvorschriften* (Special Building Specification). With four groups of stakeholders, the *Sonderbauvorschriften* was aimed at determining building and zoning regulations. The *Entwicklungsleitbild* (Development Mission Statement), by public and private landowners and the City of Zurich, was the informal procedure for setting the framework and guidelines for the formal procedure.

Objective	Requirement	Formal procedure	Formal procedure with assistance of informal procedure
To enable high-quality results	Considering all relevant inputs	o/-	o
	Exactly describing the impacts on transport system	+/o	+/o
	Appropriately selecting the procedure	+/o	+
	Ensuring accessibility	o	o
	Gaining acceptance by stakeholders	+/o	+/o
To avoid conflicts among stakeholders	Opening for every stakeholder	o/-	o/-
	Processing with a fair and understandable procedure	+/o	+
	Avoiding conflicts after decision-making	o	o
	Appropriately reporting of progress and results	+/o	+/o
To optimise cost effectiveness and time efficiency	Minimising cost and time of providing inputs	o	o
	Minimising cost and time of processing a procedure	o	o
	Avoiding causes of delaying the project	o	o
	Enabling the continuation of the procedure	-	o

Table 25: Evaluation Matrix of the procedures for Zentrum Zürich Nord

Formal procedure

In the formal procedure of the *Sonderbauvorschriften*, opinions of a key stakeholder – the airport authority – were missing. The experts of the Canton of Zurich investigated the impacts with the complex transport models. The formation of “Arbitration” was not completely fitted with its conflict intensity. The results were able to ensure only regional accessibility. The end-products were accepted by the majority of stakeholders.

The formal procedure was limited to some key stakeholders and some affected stakeholders. The two-way communication method was quite understandable for the participants. The results were in a partly win/partly lose situation. Among the further conflicts to be resolved were the numbers of parking spaces to be provided. The results were the building and zoning regulations for the projects.

With only four participants, some inputs came indirectly from non-participating stakeholders. In this formal procedure, the City of Zurich played the roles of neutral party. The results left minor conflicts unresolved, e.g. the number of parking spaces. The *Sonderbauvorschriften* was processed until the building and zoning regulations were complete.

Formal procedure with the assistance of procedure for *Entwicklungsleitbild*

Even with the assistance of the *Entwicklungsleitbild*, a key stakeholder – the airport authority – was still missing. The experts of the City of Zurich investigated the project’s impacts on the transport system. Direct negotiation formation in the informal procedure, combined with the arbitration of the formal procedure, were able to answer needs based on its conflict intensity. All stakeholders were satisfied by these procedures. The results were still able to ensure only regional accessibility. The results were accepted by the majority of stakeholders.

The informal procedure for the *Entwicklungsleitbild* was limited to some stakeholders. With the assistance of this informal procedure, the procedures processed were fair and understandable. The results were in a partly win/partly lose situation with some further conflicts to be resolved. Confidential reports were selected to distribute their proceedings and results.

The informal procedure was composed of three stakeholders. Some inputs had to come indirectly from non-participating stakeholders. In the procedure of the *Entwicklungsleitbild*, direct negotiation did not require a neutral party. Conflicts over the number of parking spaces might have caused delays in the

project. The *Entwicklungsleitbild* had one-year timeframe. It finished with the mission statement for processing the *Sonderbauvorschriften*.

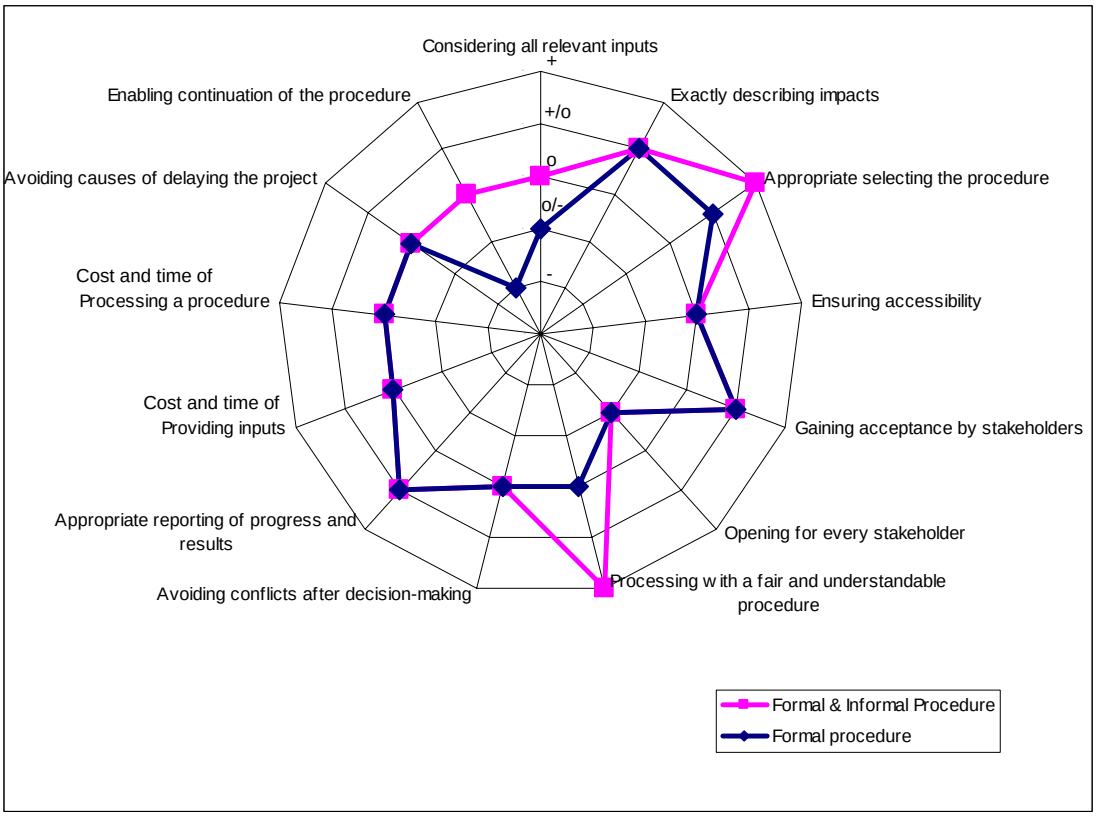


Figure 33: Efficiency of the procedures for Zentrum Zürich Nord

Summary on the assessment of the implemented procedures

The formal procedure of the *Sonderbauvorschriften* was able to create relative high-quality results. It could also produce a moderate ability in avoiding conflicts among stakeholders and optimising cost effectiveness and time efficiency. The presence of the informal procedure of the *Entwicklungsleitbild* helped slightly increase in the quality of results. The ability in avoiding conflicts among stakeholders and optimising cost effectiveness and time efficiency was also slightly increased.

4.6. Assessment of Project Locations

In this study, projects were sorted into three different locations: airport area, airport city, and airport region. Projects on the same location were supposed to share some needs in common.

4.6.1. Projects in Airport Areas

These projects were considered as a national issue. The major conflicts of projects in airport areas were based on economic and environmental aspects. Conflicts on a ground access system were considered as minor ones. Formal

procedures for projects in airport areas – airport expansion projects – were able to produce relatively high-quality results and had a moderate level of ability in avoiding conflicts among stakeholders. However, the ability in optimising cost effectiveness and time efficiency varied case study-by-case study.

In the formal procedures, impacts of the projects on the transport system were investigated by experts of the planning authority. As the projects were about airports, both regional and an airport's accessibility were ensured. A large number of stakeholders participated in the formal procedures. However, some of them believed that the results were already fixed by political power. The results were satisfactory to the majority of stakeholders, but some groups of stakeholders filed lawsuits against the proposed projects. Projects in airport areas affected a large number of stakeholders. Stakeholders were keen to express their opinions through several available media. Conventional public hearings were quite fair and understandable, but planning authorities alone made the decision on the proposed projects. Some conflicts could not be resolved in the limited time span of formal procedures.

Informal procedures for these projects focused on avoiding conflicts among stakeholders and optimising cost effectiveness and time efficiency. And, the results were quite successful on the aspects of ground access systems. However, economic and environmental aspects dominated in the planning procedures. Conflicts on these aspects were high in intensity and might have caused a huge amount of budget and a lengthy process to find appropriate agreements. As these were major projects in the regions, all groups of stakeholders were invited into the informal procedures. External experts were also invited to be the neutral parties, moderators, facilitators, and impact investigators. Agreements on ground access systems could be easily reached if the major conflicts on economic and environmental aspects were resolved.

4.6.2. Projects in Airport Cities

Unfortunately, with the project "AirRail Center Frankfurt" alone in this category, it was not possible to find the ability of procedures in integrated planning for the projects in airport cities in common.

4.6.3. Projects in Airport Regions

Major concerns on projects in this category were on an airport's accessibility and effects of the projects on the existing city centres. Formal procedures alone could produce relatively high-quality results. Impacts of the projects were investigated by experts of a planning authority – a key stakeholder of the projects – and they also served as neutral parties. Regional accessibility alone

was ensured. Conventional public hearings allowed all stakeholders to participate, but some stakeholders were not satisfied by this method. Formal procedures for these projects were always finished with further conflicts left to be resolved.

Informal procedures were able to slightly increase the quality of results. Unfortunately, informal procedures were not able to ensure an airport's accessibility because the representatives of the airport authority were always missing from the informal procedures. The procedures were quite fair and understandable. They also were fitted to conflict intensity on the projects. However, they tended to fail in avoiding conflicts among stakeholders. Most projects in this category were delayed because some conflicts could not be resolved in the appropriate time span. These deficiencies also affected the ability in optimising cost effectiveness and time efficiency.

Projects in different airport regions were subjected to different planning laws and systems. Procedures in each airport region had specific principles and concepts. For this reason, the efficiency of the implemented procedures on each airport regions was identified.

Amsterdam Region

As stated in chapter 3.2, projects in the Amsterdam Region were subjected to the Spatial Planning Act and Housing Act. Planning authorities took the major responsibility and held a high stake in any large public projects within their governing boundary. Under the planning regulations in the Netherlands, participation in the formal procedures in this region was limited to some key stakeholders. Formal procedures alone were able to produce moderate quality results. The results from formal procedures were able to ensure regional accessibility with moderate acceptance by stakeholders. However, deficiencies in the ability to avoid conflicts and to optimise cost effectiveness and time efficiency were substantial. Most stakeholders were not able to share their opinions of the projects. Reports on progress of formal procedures were confidential. Some major conflicts were unresolved and caused a large amount of budget and delays of projects.

Informal procedures were able to slightly increase the ability to enable high-quality results. Facilitation formation by informal procedures considered the opinions of some stakeholders who did not participate in the formal procedures. However, the domination of the planning authority on the projects persisted. They still acted as a neutral party and took charge in investigating a project's impacts. Some stakeholders were not satisfied by this condition. After decision-making, there were some further conflicts to be resolved.

Informal procedures were either started before the formal procedure or ended after submitting their results to be further processed in formal procedures. For these reasons, the ability in optimising cost effectiveness and time efficiency was just slightly increased.

Frankfurt Region

Formal procedures in Frankfurt Region were subjected to the *Ruamordnugsgesetz* and *Baugesetzbuch*, as well as the laws of several planning sectors. Formal procedures were able to create moderate to relatively high-quality results, a moderate level of ability in avoiding conflicts among stakeholders, and a relatively low level in optimising cost effectiveness and time efficiency. Public hearings in formal procedures allowed all stakeholders to participate and share their opinions. However, some stakeholders decided not to participate and their opinions were missing in processing the formal procedures. Planning authorities investigated the project's impacts and also played the role of neutral party. Regional accessibility was ensured with acceptance by the majority of stakeholders. However, some stakeholders were not satisfied with the arbitration formation of formal procedures because they produced a win/lose situation. With this deficiency, some stakeholders filed lawsuits against the proposed projects which caused a large amount of budget to be spent and lengthy legal processes.

Informal procedures could help increase the ability in all objectives to relatively-high or high levels. Conflict partners were invited to participate in the informal procedures. External experts investigated a project's impacts on the transport system, and both regional and the airport's accessibility were ensured. Non-arbitration formations were appropriate to their conflict intensity and they were considered as fair and understandable procedures. The results were accepted by all, or nearly all, stakeholders. Each stakeholder was able to participate in either the formal or informal procedure, or both. Therefore, most required inputs came directly from the original sources. The presence of neutral parties, who were not affected by the proposed projects, could help through faster processing of the procedures. Most conflicts were eliminated and the continuation of informal procedures ensured that further conflicts would not be omitted.

Zurich Region

Only a few aspects of the formal procedures for two case studies were shared in common. Anyway, special formal procedures – a public voting system and the *Sonderbauvorschriften* – were able to produce relatively high-quality results and a moderate level of ability in avoiding conflicts among

stakeholders and optimising cost effectiveness and time efficiency. Both formal procedures were able to ensure regional accessibility. The results were accepted by the majority of stakeholders and were reported appropriately. However, the formal procedures were ended after decision-making.

Informal procedures could mainly help increase the ability in enabling high-quality results, but the ability in avoiding conflicts among stakeholders and optimising cost effectiveness and time efficiency were only slightly increased. However, it was not possible to explain this by each requirement because the level of ability was not shared in common.

4.7. Results from the Assessment Process

The cooperation of formal and informal procedures of the case studies was aimed at achieving the efficient integration of land-use and transport in airport regions. However, the implemented procedures were not able to completely accomplish every requirement. Some deficiencies created by the nature of a formal procedure were not fulfilled by an informal procedure. And some requirements, which a formal procedure could completely achieve, were repeatedly processed in an informal procedure. From the evaluation matrices and the radar graphs on the efficiency of the implemented procedure, the results could be summarized as follow[6].

4.7.1. To Enable High-Quality Results

In all case studies, formal procedures alone were able to produce moderate to relatively high-quality results. With the assistance of informal procedures, the ability in this objective was increased to a nearly complete level.

- *Considering all relevant inputs*. Formal procedures could consider the inputs only when they came directly into the procedures. Some government organisations assumed the role as the representatives of the non-participating stakeholders, but the opinions of those stakeholders were brought to the formal procedure indirectly. Informal procedures could increase the ability of this requirement, if the non-participating stakeholders in formal procedures joined the informal procedures.

[6] It should be mentioned that the implementation of a formal procedure alone had never happened in any case study used in this study. All case studies processed both formal and informal procedures. For this reason, the assessment of formal procedures alone had to be conducted from their principle concepts.

- *Exactly describing impacts on the transport system*. In formal procedures, the experts of planning authorities investigated the project's impacts on the transport system with complex transport models. However, those experts were doubted in their neutrality because they were the staffs of the organisations that would be affected by the proposed project. Informal procedures could increase the ability in this requirement by inviting external experts to investigate the impacts. External experts who did not affected by the proposed projects were not likely to produce biased investigations and descriptions. Furthermore, their neutral status could help increase the stakeholders' acceptance of the investigated impacts.

- *Appropriately selecting the procedure.* The general formation of formal procedures was arbitration. A planning authority was the decision-maker responsible for approving the application proposals. Arbitration was usually inappropriate to conflict intensity relative to the projects. Conflicts on impacts of projects on a transport system needed co-operative decision-making. A single decision-maker could not fulfil this need. Informal procedures helped to increase this ability by setting up another instrument with co-operative formations. They were direct negotiation, facilitation, and mediation, all of which depended on conflict intensity. Descriptions of these formations were discussed in chapter 2.2.3.

- *Ensuring accessibility*. Formal procedures alone were able to ensure regional accessibility. It was indicated in planning regulations that impacts of the proposed projects on a transport system had to be compatible with the capacity of the regional transport infrastructure. An airport's accessibility was usually not considered in most formal procedures, except for projects in airport areas. Informal procedures were expected to fulfil this mission. Informal procedures for airport expansion projects and airport cities brought this issue into their procedures because it was one of their major concerns. Few informal procedures for projects in an airport region were able to ensure the airport's accessibility.

- *Gaining acceptance by all stakeholders*. The decision-making process in formal procedures relied on planning laws and building codes. For this reason, results from formal procedures were always accepted by the majority of stakeholders. However, the opinions of the minority groups who did not agree with the proposed projects were always omitted. Informal procedures were aimed at satisfying all stakeholders.

Informal procedures, which were able to completely achieve this requirement, were ones that included minority groups as participants.

4.7.2. To Avoid Conflicts among Stakeholders

Formal procedures alone produced a low to moderate level of ability in avoiding conflicts among stakeholders. In most case studies, most informal procedures were able to increase the efficiency in this objective. However, a few informal procedures were not able to eliminate conflicts relative to the proposed projects.

- *Opening for every stakeholder*. Formal procedures with conventional public hearings allowed all stakeholders to express their opinions relative to the proposed projects. However, some stakeholders decided not to participate in formal procedures. Some formal procedures were limited to some key stakeholders. Informal procedures were aimed at including non-participating stakeholders in their forums. However, some informal procedures could not achieve this requirement because they were also limited to key stakeholders alone.

- *Processing with a fair and understandable procedure.* Most stakeholders were familiar with discussions in public hearings. However, stakeholders did not understand the decision process, which was taken charge of by the planning authority alone. Formal procedures also allowed two-way communication, but some conflicts could not be resolved in just one or two discussions. Unfortunately, formal procedures did not provide an appropriate time period for discussion among stakeholders. Informal procedures of all case studies were fairly and understandably processed. Without the limitations set by planning regulations, informal procedures could be freely designed to achieve this requirement.

- *Avoiding conflicts among stakeholders*. Formal procedures were able to decide only whether or not the proposed projects would be approved. Therefore, the results were always in a win/lose situation. Needs of the losers were not of concern. Informal procedures were able to consider alternative proposals. They were also concerned about the needs of all stakeholders. This procedure could produce a win/win situation. However, some informal procedures could not bring conflicts of interest into balance, and those projects were usually delayed by lawsuits.

- *Appropriate reporting of progress and results*. Appropriate reports on the progress and results of procedures were able to be distributed to non-participating stakeholders, and they could help in avoiding conflicts among stakeholders. Formal procedures always produced confidential reports regarding progress and public reports for results, as well as most informal procedures. Only a few informal procedures distribute public reports on both progress and results.

4.7.3. To Optimise Cost Effectiveness and Time Efficiency

Formal procedures always produced a low ability in optimising cost effectiveness and time efficiency. Informal procedures were aimed to increase the ability of this objective. In some case studies, the ability in this objective was increased to a moderate or high level. However, informal procedures only slightly helped in some case studies.

- *Minimising cost and time of providing inputs*. Stakeholders and their opinions were considered as inputs for processing the procedures. Cost and time of providing inputs could be minimised if all stakeholders participated in the procedure. The principle of formal procedures would prefer to include all stakeholders in their public hearings. However, there were some stakeholders who decided not to participate in the formal procedures. Planning authorities could not totally complete the tasks of representing non-participating stakeholders. Informal procedures could achieve this ability if they were able to bring those missing stakeholders in the formal procedures into their forum. However, most informal procedures could not achieve this requirement because they were limited to key stakeholders alone.

- *Minimising cost and time of processing a procedure*. Appropriate neutral parties could help shorten time spent on procedures and avoid unnecessary payment. On the other hand, inappropriate neutral parties would not satisfy the stakeholders and led to a high amount of budget and lengthy procedures. In most formal procedures, a stakeholder, usually a responsible planning authority, served as the neutral party and decision-maker. Some stakeholders were not satisfied by this condition. Some informal procedures tried to solve this problem by inviting or hiring external neutral parties. However, in some informal procedures, this problem was not fully solved because a responsible planning authority still served as the neutral party.

- *Avoiding causes of delaying the project*. With a win/lose situation relative to the results of formal procedures, formal procedures were not

able to avoid the causes of delaying the project. Stakeholders who were not satisfied by the results from formal procedures might file lawsuits against the proposed projects. All informal procedures tried to solve this problem by balancing conflicts of interests. However, a couple of informal procedures did not achieve this requirement because the conflict partners did not participate in the informal procedures.

- *Enabling continuation of the procedure*. Some conflicts required a lengthy timeframe in finding appropriate solutions. Some conflicts occurred after making a decision on the project proposal. And, some conflicts were unpredictable. Furthermore, the progress of the project needed monitoring. With the fixed time period of formal procedures, this requirement was not completely achieved. However, most informal procedures had a limited operation time period and they were usually finished before formal decision-making. Only a few informal procedures kept running until the entire projects were completed.

5. Recommendations

5.1. Introduction

This part of the study contains recommendations for efficiently implementing procedures for integrated planning of land-use and transport in airport regions. It consists of sub-chapters that explain the proposed planning procedure, the feasibility of completing the plan's requirements, and conclusions.

Chapter 5.2, "Recommendations and guidelines", provides instructions for selecting and implementing formal and informal procedures for integrated planning of land-use and transport in airport regions.

Chapter 5.3, "Evaluation of the proposed planning procedure" contains the results of an investigation of the ability of the proposed planning process in terms of supporting its requirements.

Chapter 5.4, "Validity and limitation" contains an explanation of specific concerns relative to three areas in airport regions in order to efficiently implement the proposed procedures for projects in airport region.

5.2. Recommendations and Guidelines

Based on the analysis of seven case studies in three airport regions in North Western Europe, it was concluded that a formal procedure alone could not create an efficient integration of land-use and transport in airport regions. An informal procedure was created to be a supplementary instrument to fulfil the deficiencies of a formal procedure. Conceptually, formal and informal procedures should work together – with appropriate division of responsibilities – to achieve the goals of integrated planning. In this chapter, guidelines for selecting the appropriate procedures are explained. The guidelines were composed of eleven consecutive steps concerning the formal and informal procedures. An overview of the guidelines is shown in Figure 34, and the details of each step are explained in the discussion that follows.

Guidelines and Recommendations for Integrated Planning of Land-Use and Transport in Airport Regions

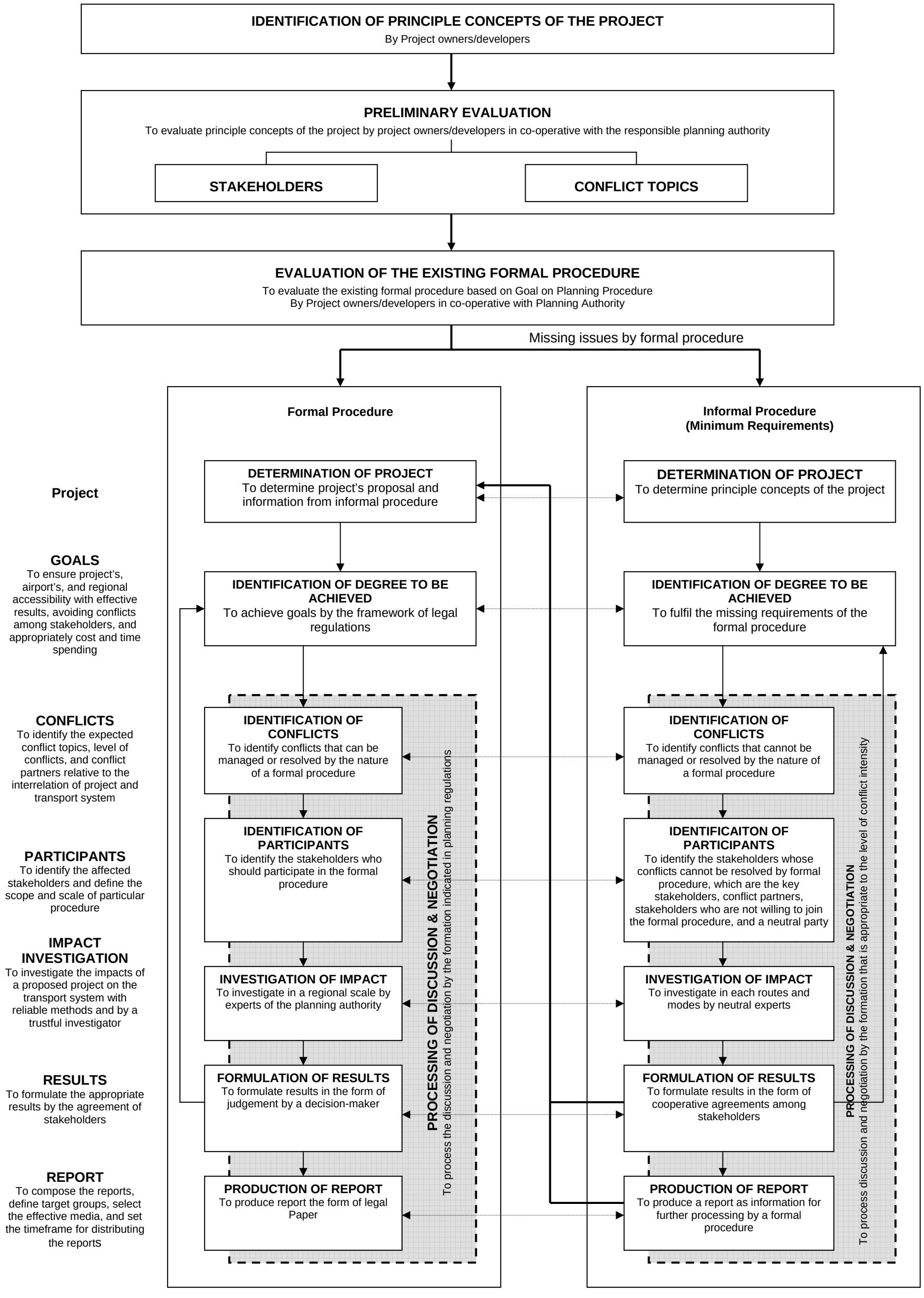


Figure 34: Proposed formal and informal procedures for projects in airport regions

5.2.1. Identification of Principle Concepts of the Project

The beginning point of projects in airport regions should be the identification of principle concepts of the project. Principle concepts of the project are the basis ideas that led to the initiation of the project. For example, the basic idea "to expand an airport's capacity" is the principle concept for a new runway project. This task should be the responsibility of project responsible bodies – project owners or project developers. It is possible that the responsible bodies would work together with other organisations, which were likely to be affected by the principle concepts, in formulating principles.

5.2.2. Preliminary Evaluation

The second step is to evaluate the principle concepts of the project. The evaluation could be processed by the cooperation of project responsible bodies and the planning authority who governs the project's location area. From the preliminary evaluation, stakeholders and conflict topics relative to the principle concepts of the project would be identified. The "Stakeholder Analysis[7]" technique could be applied in identifying the relevant stakeholders and their opinions of the principle concepts of the project. The identification of stakeholders and conflict topics in each project helps in estimating the scope and scale of planning procedures.

5.2.3. Evaluation of the Existing Formal Procedure

This step is to evaluate the existing formal procedure on its ability in achieving the general goal of integrated planning. The evaluation would be conducted by project responsible bodies in co-operation with a responsible planning authority. The key question in this evaluation is whether or not a formal procedure alone is able to create an efficient integration of the proposed project and transport system. Because of the complexity of planning in airport regions, a formal procedure alone was usually unable to completely achieve this goal. Deficiencies of the existing formal procedure are expected to be eliminated by an informal procedure. Results from this evaluation are information for identifying the framework of formal and informal procedure in the contexts of the type of proposal to be considered, goal, participants, conflicts, impacts, formation of the procedure, results, and reports.

5.2.4. Determination of the Project

Like the identification of stakeholders and conflict topics, a determination of the project helps provide the scope and scale of a planning procedure. In an informal procedure, the principle concepts relative to the project are the basis

[7] "Stakeholder Analysis" proceeds by identifying stakeholders who affected, or are affected by, the phenomenon and collects data about their actions, perceptions, behaviours, experiences and thoughts in relation to the phenomenon. (Burgoyne, 1994)

for processing the procedure. Results of an informal procedure would be submitted to a formal procedure as the guidelines and framework for further process. Project responsible bodies would take the information of the results from an informal procedure as the information for designing their project's proposal. The proposal would be submitted for an approval process by a formal procedure.

5.2.5. Identification of Goals

The general goal is "Efficient integration of land-use and transport in an airport region", which further included "ensuring a project's, an airport's, and regional accessibility". To achieve this goal, the results should be complete and in accordance with high-quality standards. Conflicts among stakeholders should be eliminated or mitigated by an appropriate formation of a procedure. A sufficient budget and its time period is another important objective. Delays and uncontrollable budget in planning procedures might cause high losses relative to the overall national economy. Therefore, the procedures should be able to minimise expenditures and time spent during each step of both the formal and informal planning procedures.

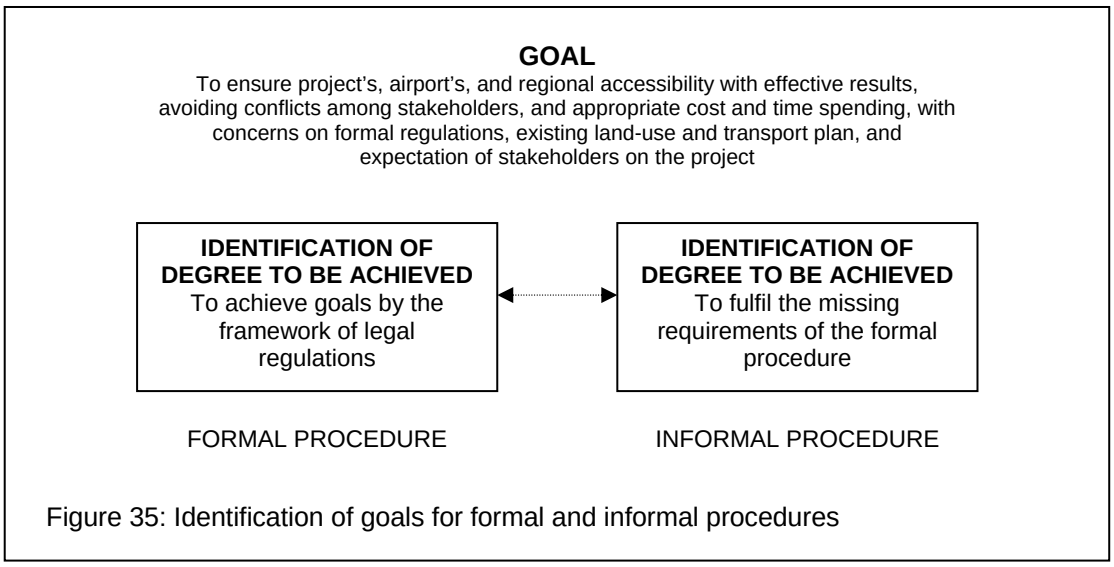


Figure 35: Identification of goals for formal and informal procedures

The goal of the formal procedure is limited by the framework on planning regulations. Formal procedures considered whether or not the proposed project conformed to land-use plan, at the regional and local level, and building regulations. Relative to transport a formal procedure can consider only whether or not impacts of the proposed projects are compatible with the existing transport infrastructure. In contrast, an informal procedure can proceed without the rigid regulations of planning laws. An informal procedure should be able to fulfil the missing requirements of a formal one, and find appropriate solutions in relation to the project's impacts.

5.2.6. Identification of Conflicts

Defining the conflicts among stakeholders leads to the selection of an appropriate formation of planning procedures. In this step, there are three aspects to be considered in analysing conflicts among stakeholders – conflict topics, conflict partners, and conflict intensity (see chapter 2.2.3). Determining "conflict topics" is to predict all possible conflicts caused by the impact of a proposed project on its regional transport system. Determining "conflict partners" of each conflict topic is to identify two or more groups of stakeholders who have experienced conflicts of interest relative to each other. "Conflict intensity" of each conflict topic could be classified into three levels – issue, dispute, and impasse. Conflicts identified in this step will be the criteria used in selecting an appropriate formation of the procedures.

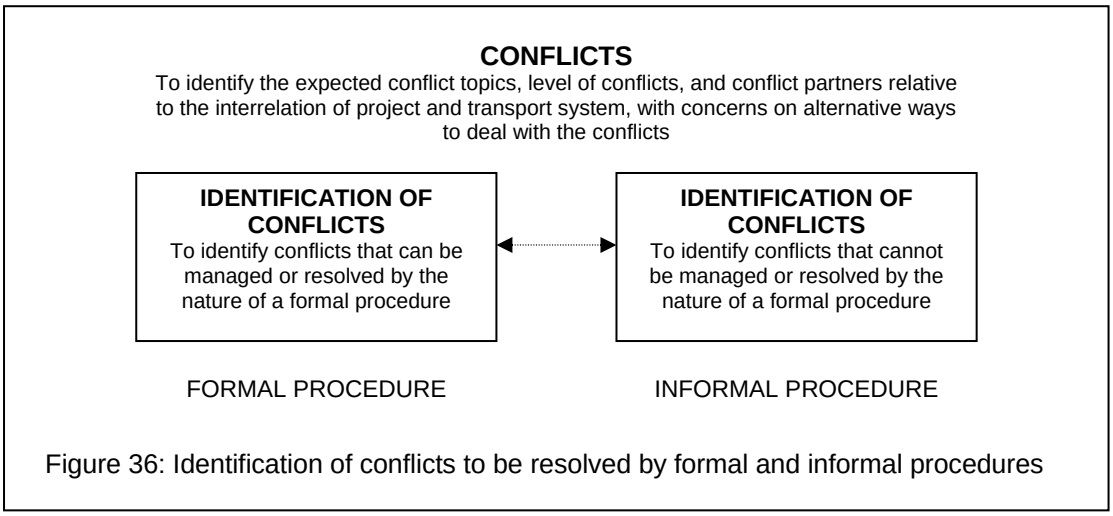


Figure 36: Identification of conflicts to be resolved by formal and informal procedures

Formal procedures usually have limitations in dealing with moderate or high conflict intensity because their major tasks are to indicate whether the project's proposal will be approved or not. Therefore, formal procedures can solve only some conflicts. Conflicts with moderate and high conflict intensity, as well as unsolved conflicts with low conflict intensity, should be processed by informal procedures. With the flexible structure and regulations of informal procedures, they should be able to find the appropriate solutions for these conflict topics.

5.2.7. Identification of Participants

The next step is to select stakeholders who would participate in the formal and informal procedures. For a project that highly influenced both the regional and national economy, like in airport regions, the key stakeholders – decision-makers, a city or regional planning authority, project responsible bodies, and an airport authority – are very crucial members of both the formal and informal procedures. In all case studies, a planning authority served as the neutral party and impact investigator in the formal procedures. This condition

decreased the acceptance rate from some stakeholders. In a formal procedure, a public hearing – the general citizen/participant instrument - allowed all stakeholders to participate. However, some stakeholders were not satisfied with public participation in a formal procedure. With the shortcomings of public hearings described in chapter 2.2.1, most major conflicts could not be resolved, when conflict partners did not have appropriate opportunities to discuss them with each other.

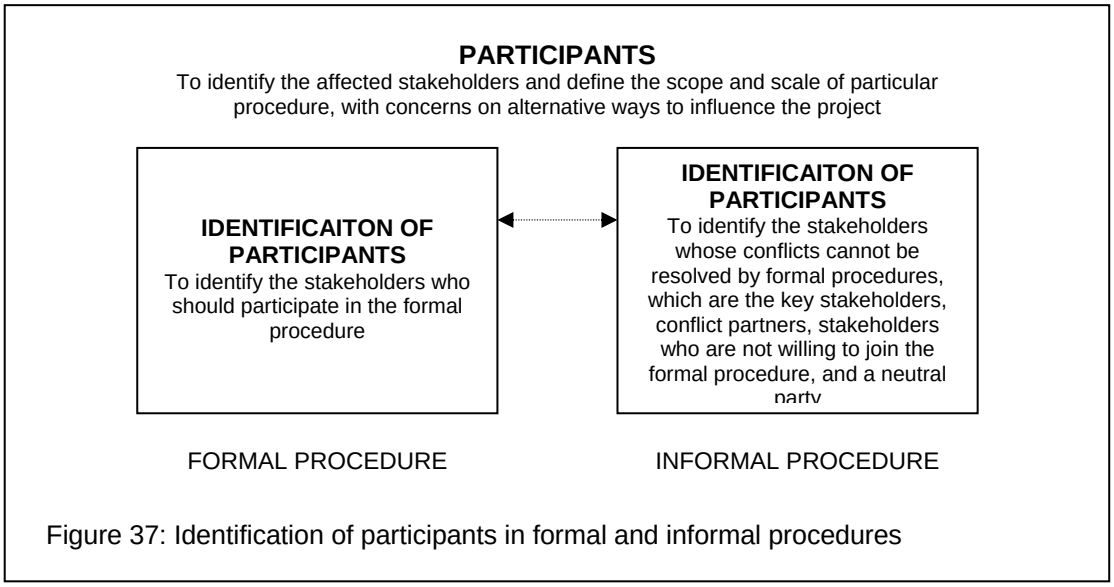


Figure 37: Identification of participants in formal and informal procedures

Since informal procedures were expected to fulfil the deficiencies of formal procedures, all stakeholders, who were not satisfied by the formation, process and expected results from formal procedures, should be invited to participate in informal procedures. An appropriate informal forum should be composed of all key stakeholders relative to the proposed project, conflicts partners, and stakeholders who did not participate in the formal one and were not satisfied with the project proposal. The presence of external neutral parties would also help increase the efficiency on integrated planning.

5.2.8. Processing of Discussion and Negotiation

Discussion and negotiation are central elements of any planning procedure. Together, they combined five steps – identification of conflicts, identification of participants, investigation of impacts, formulation of results, and production of reports. Discussion and negotiation is a process in which all participants meet and try to find a suitable resolution for the cause of the conflicts, and in some cases, with the assistance of neutral parties.

Discussion and negotiation depend mainly on the interrelation of the level of conflict intensity and the formation of a procedure. The formation, stated in chapter 2.2.3, ranged from direct negotiation, facilitation, mediation, and

arbitration, respectively. An appropriate discussion should be conducted with fairness, understandability, be direct, and without a hidden agenda.

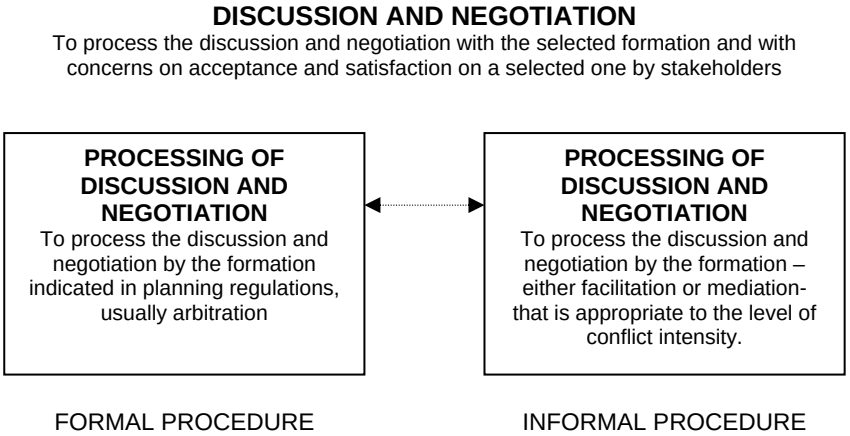


Figure 38: Discussion and negotiation in formal and informal procedures

The formation of a formal procedure was always the arbitration. With the limitations of its regulations and structure, discussion and negotiation in a formal procedure were not able to produce effective conflict resolutions. A responsible planning authority listens to conflict partners and suggests a solution that the parties could accept or reject. Conflict partners who rejected the solutions were likely to file lawsuits against the results from a formal procedure.

Without rigid and static regulations and structure, an informal procedure tended to produce effective discussion and negotiation. The formation of an informal procedure can be set with an appropriate correlation to the level of conflict intensity. The formations of “Facilitation” and “Mediation” are recommended here because they fitted with the level of conflict intensity relative to projects in airport regions. In addition, conflicts relative to projects in airport regions require appropriate neutral parties for facilitating acceptable agreements. Therefore, the selection of specific neutral parties is very important. Stakeholders expected that neutral parties must be just and fair as well as not be affected by the results from both formal and informal procedures.

5.2.9. Investigation of Impacts

Impact Investigation is a step in predicting the impacts of a proposed project on a transport system, and is used for further discussion. The impact investigator should be reliable, possess related knowledge, and be trusted by all participants. An investigator is normally an expert in the interrelation of

land-use and transport. In addition, the investigator should be able to communicate the results of the investigation in understandable ways.

In a formal procedure, a planning authority normally investigated the impacts of a proposed project on a regional scale. Since the planning authority is one of the key stakeholders of many projects in airport region, some stakeholders did not trust the investigation process and its results.

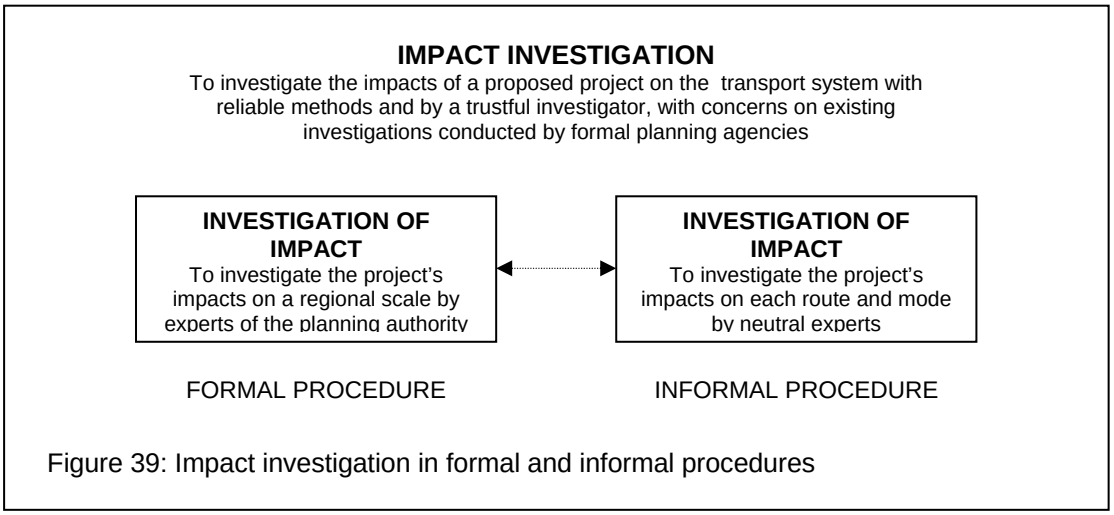


Figure 39: Impact investigation in formal and informal procedures

Investigation of impacts in an informal procedure should be more intensive than that in a formal procedure. The investigation method should be complex, not simplistic, and reliable enough to efficiently illustrate the impact effects. The scope and scale of the investigation are other aspects of concern. In an airport region, three focal areas for investigation are the project itself, the airport, and the major transport routes and modes of the entire region. In addition, an investigation in an informal procedure could use the results of an existing investigation as complementary data. Moreover, the investigation method should be compatible with that used by a formal planning authority. It would be easy to check for and monitor an additional investigation.

5.2.10. Formulation of Results

Results are the end products of a procedure. Appropriate results should be able to show that the goal "to ensure a project's, an airport's, and regional accessibility" was accomplished. Conflicts among stakeholders should be eliminated or at least mitigated to an acceptable level. Total expenditures and time spent on the procedures should be kept under control. When results emerged, it is necessary to recheck them with the expectations set in the very first step in order to guarantee the quality of the procedures.

With the formation of arbitration, results of a formal procedure always come from the lone judgment of a decision maker – usually a responsible planning authority. The other stakeholders are not able to take part in the decision-making process. The results from a formal procedure are always in a win/lose situation. For this reason, some stakeholders were not satisfied with the results from a formal procedure. This problem usually causes delays of the project.

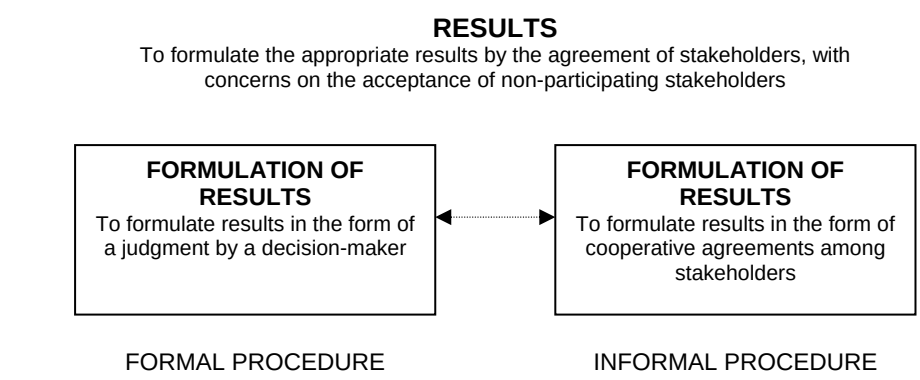


Figure 40: Formulation of results in formal and informal procedures

As recommended in Chapter 5.2.8, the appropriate formation of an informal procedure is “Facilitation” or “Mediation”. These formations supported decision-making with cooperative agreements made by the participants. The desired results should be in a win/win situation. With a co-operative decision-making process, conflicts among stakeholders could be eliminated with acceptable agreements. The appropriate results could also help in optimising cost effectiveness and time efficiency for both formal and informal procedures. Results from an informal procedure would be submitted to a formal planning authority for further processing.

5.2.11. Production of Reports

A report is another important element of both formal and informal procedures. An appropriate report should be clear, easily understandable, and directly relevant to the points to be explained. According to planning regulations, a formal procedure must publish their legal report after approving the proposed project. The progress of the procedure and preliminary agreements are usually not disclosed or are recorded in a confidential report. Non-participating stakeholders have no access to that information.

It is expected that an informal procedure will produce appropriate reports. Internal confidential reports, circulated to the participants, are a record of an

informal procedure's progress. They reminded the participants about agreements, which were already completed, and a further agenda. Public reports, distributed to the general public, also informed non-participating stakeholders about the progress and results of an informal procedure. A public report is a crucial tool for avoiding disputes, misunderstandings, and conflicts of non-participating stakeholders. Presentation methods, their sequence, and media for public reports are also important.

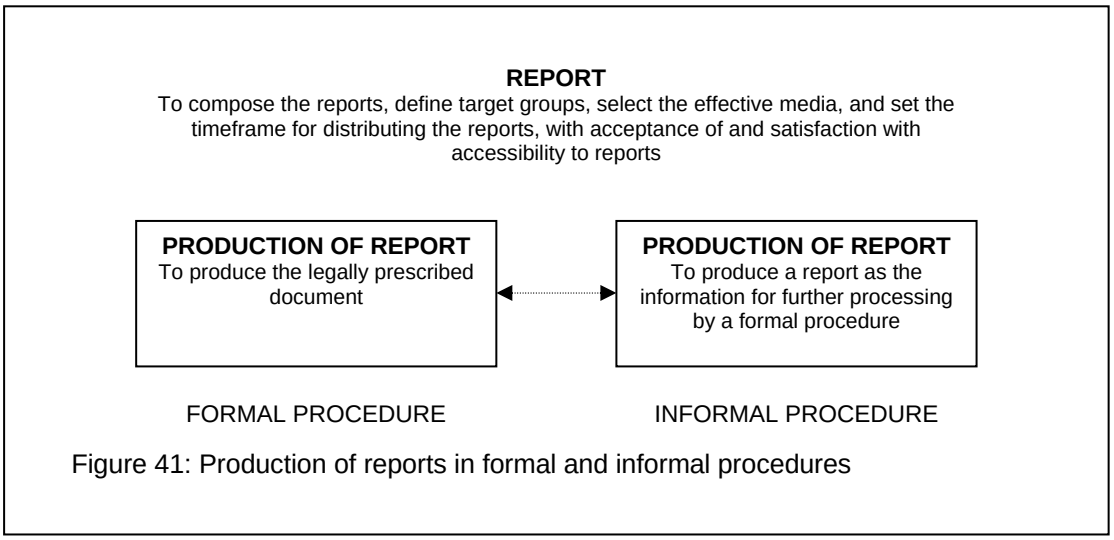


Figure 41: Production of reports in formal and informal procedures

5.3. Evaluation of the Proposed Planning Procedure

An actual planning procedure usually takes several years, and, in some cases, took over a decade. Sometimes, it was unable to test the proposed planning procedure in an actual situation. Because of this situation, evaluation matrices were applied to ensure that the proposed informal process was able to create an efficient integration of land-use and transport in airport regions.

A proposed planning procedure should be able to fulfil all requirements of a procedure which were discussed in Chapter 2.3.3. Each requirement under three objectives – to achieve high-quality results, to avoid conflicts among stakeholders, and to optimise cost effectiveness and time efficiency – should be fully completed by at least one step of a proposed procedure. Table 26 illustrates the evaluation matrices used for this determination.

Proper "determination of project" in a formal and an informal procedure could help in achieving the requirements by considering all relevant inputs, ensuring accessibility, minimising cost and time of providing inputs, and avoiding causes of delaying the project. Appropriate "identification of goal" on planning procedures would create success in considering all relevant inputs, exactly describing impacts on the transport system, ensuring accessibility, and gaining acceptance by stakeholders. Furthermore, this proposed planning

step could help in avoiding conflicts after decision-making, minimising cost and time of providing inputs, eliminate causes of delaying the project, and enabling continuation of the procedure.

Appropriate “identification of conflicts” could provide achievements in considering all relevant inputs, appropriately selecting the formation of the procedure, and gaining acceptance by stakeholders. The requirements on opening for every stakeholder, avoiding conflicts after decision-making, and all requirements under the objective “to optimise cost effectiveness and time efficiency” would also be successful by use of this planning step. When the participants were properly identified, all requirements of the objective “to enable high-quality results” would be accomplished. This planning step could help in opening for every stakeholder, in avoiding conflicts after decision-making, and in most of the requirements under the objective “to optimise cost effectiveness and time efficiency” would be successful.

The proper selection of a procedure’s formation for discussion and negotiation would add to success by avoiding conflicts among stakeholders and also causes of delaying the project. Furthermore, the cost and time spent would be minimised. Efficient impact investigation would help mainly by exactly describing impacts on the transport system, ensuring accessibility, and gaining acceptance by stakeholders. Conflicts which led to delays of the project would also be eliminated. Appropriate impact investigation could minimise cost and time of processing a procedure.

Suitable formulation of results from a procedure would affect the efficiency of accessibility and the acceptance of stakeholders. Also, conflicts after decision-making which might lead to delays of the project would be avoided. Proper and timely production of reports would gain acceptance by stakeholders, and avoid conflicts.

From the evaluation matrices, it was clear that each requirement was fully contributed to by at least one step of the proposed planning procedures. Therefore, it is highly possible that a proposed procedure should be able to create an efficient interrelation of land-use and transport in airport regions.

Procedure's steps	Formal procedure	Informal procedure	To enable high-quality results					To avoid conflicts among stakeholders				To optimise cost effectiveness and time efficiency			
			Considering all relevant inputs	Exactly describing impacts on transport system	Appropriately selecting the procedure	Ensuring accessibility	Gaining acceptance by stakeholders	Opening for every stakeholder	Processing with a fair and understandable procedure	Avoiding conflicts after decision-making	Appropriately reporting of progress and results	Minimising cost and time of providing inputs	Minimising cost and time of processing a procedure	Avoiding causes of delaying the project	Enabling continuation of the procedure
Determination of project	To determine a project's proposal and information from informal procedure	To determine principle concepts of the project	■			■						■		■	
Identification of goals	To achieve goals by the framework of legal regulations	To fulfil the missing requirements by formal procedure	■	■		■	■			■		■		■	■
Identification of conflicts	To identify conflicts that can be managed or resolved by the nature of a formal procedure	To identify conflicts that cannot be managed or resolved by the nature of a formal procedure	■				■	■	■	■		■	■	■	■
Identification of participants	To identify the stakeholders who should participate in the formal procedure	To identify the stakeholders whose conflicts cannot be resolved by formal procedure, which are the key stakeholders, conflict partners, non-participating stakeholders in a formal procedure, and a neutral party	■	■	■	■	■	■		■		■	■	■	
Investigation of impacts	To investigate impacts on a regional scale by experts of planning authority	To investigate each route and mode by neutral experts		■		■	■			■			■	■	
Processing of discussion and negotiation	To process the discussion and negotiation by arbitration formation	To process the discussion and negotiation by the formation that is appropriate to the level of conflict intensity			■		■		■	■		■	■	■	
Formulation of results	To formulate results in the form of a judgment by decision-maker	To formulate results in form of cooperative agreements among stakeholders				■	■			■				■	
Production of reports	To produce the legally prescribed document	To produce reports as information for further process by a formal procedure					■			■	■			■	

Table 26: Evaluation matrices relative to the ability of the proposed procedure

■ Contribution of the proposed procedure compared to requirements
□ No contribution

5.4. Validity and Limitations

Projects in airport regions could be classified into three types by location – airport area, airport city, and airport region. Normally, the proposed planning procedure could be applied to projects of all types. However, there are some different points of concern regarding each type.

Projects in an airport area – a new runway, terminal buildings – were usually in the national interest. National planning agencies considered these projects as being very “high stake” for the country’s national economy. These types of projects always faced major conflicts relative to economic and environmental concerns. Other conflicts were considered as minor issues. To avoid “hidden” agendas regarding environmental issues, it is very important to clearly separate the aspects of transport from economic and environmental issues or groups. A good example is the *Mediationsverfahren* for a new runway project at Frankfurt Airport. There were three working groups under the *Mediationsverfahren* – economy, environment, and transport. The *Runder Tisch Flughafen Zürich* for the fifth expansion project of Zurich Airport is another good example. A transport working committee was set up to find the appropriate solutions for the project’s impacts on the ground access system.

An airport city area is usually not under the same governmental boundaries as its major city. Therefore, a planning authority of a major city could not directly share its opinions on the impacts of a project on a regional transport system. Informal procedures could help formal ones to eliminate this problem. The government of a major city considered projects in an Airport City as being competitors of that city’s business centre. A major city’s planning authority should be invited to participate in an informal procedure. Another issue is the accessibility to the airport that would be affected by a project in an Airport City. However, an airport authority was a shareholder in this project. These types of projects are usually closely monitored by an airport authority. Unfortunately, with only one example from this category, further studies are required for proposing more concrete recommendations.

Procedures relative to projects in an Airport Region have problems opposite to those in projects in an Airport City. These projects were not located within the same governmental boundaries as the airport. In most procedures for these projects, an airport authority did not participate although additional trips created by these projects heavily affected airport accessibility. Therefore, an airport authority should be considered as one of the stakeholders and be invited to participate in a procedure.

Not only the procedure itself, but its achievements also depended on the linkage between it and political and economic factors. A procedure would be efficient if its process could be fully combined with all pertinent political and economic factors.

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Appendix

Questionnaire (Master)

Basic information of the case study

- Project's data
  - Project's owner and/or developer
  - Type(s) of activities
  - Floor spaces
  - Accessibility
- Implemented formal and informal procedures

To enable high-quality results

1. Considering all relevant inputs
   - Who are the affected stakeholders of particular project?
   - Who are the participants in the procedure?
   - Are there any missing stakeholders who should participate in the procedure?

2. Exact depicting of the reality
   - Who is the party responsible for depicting the interrelation of project and its impacts on regional transport system?
   - What is the method for depicting the interrelation of project and its impacts on regional transport system?

3. Appropriate selecting of the procedure
   - What are the degrees of conflict intensity among the affected stakeholders?
   - What procedure is applied for integrated planning?
   - What forum or organisation is set up to process the procedure?

4. Gaining complete and effective results
   - Do the results achieve the requirements on transport planning? (ensure airport's accessibility with four objectives: mobility, economy, environment, and safety)
   - Do the results achieve the requirements of the stakeholders?

5. Gaining appropriate consideration by formal planning
   - How do the formal planning bodies consider the results from the procedure?

6. Avoiding hidden agendas

- What is the process to keep the stakeholders in the subject of the interrelation of land-use and transport?

To avoid conflicts among stakeholders

1. Appropriate selecting inputs and participants
   - What is the process of selecting the data to be used in the procedure?
   - What is the position of the representative from each stakeholder?

2. Making understandable procedure
   - Are there any difficulties for the participants from different backgrounds in adjusting themselves to participate the procedure?

3. Enabling “win-win” situation
   - Do the results satisfy needs of stakeholders?

4. Avoiding conflicts after decision-making
   - Are there any protests or disputes against the results?

5. Appropriate communication in the process of procedure
   - What type of report on the process and results of procedure for integrated planning?

To optimise cost effectiveness and time efficiency

1. Minimising cost and time for providing inputs
   - Where can the data to be used in the procedure be acquired?

2. Minimising cost and time during processing the procedure
   - How much time and expenditure did the participants spend on participating the procedure?

3. Shortening decision-making process by formal planning
   - Is the selected procedure for integrated planning able to shorten the process of making the decision by formal planning?

4. Enabling continuation of the procedure
   - How and how long are the procedure and forum be processed?
   - How can the procedure and forum be processed if there are other changes or new development projects in airport region?