



Signage Planning Manual

Planning Aids for the Design of Pedestrian Signage Systems

Patrick Wenzel

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Planning Aids for the Design of Pedestrian Signage Systems

Patrick Wenzel

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Terminology

The explanations of the following terms are to be found on the respective pages. These terms have been marked with → text by →arrows.

ADV	62	ICAO	
AIGA.....	65	Inf	
Architectural structure of a Building.....	17		
Rule of Continuity	34		
Decision Plan.....			
Decision Step			
Destination Signs.			+2
Destination We'		 59
Directional ↻		 59
DOT....		 59
Funr		 36
↻			

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1. INTRODUCTION

1.1 The Issue

Signage systems are designed to help people find their way in an unfamiliar place and to guide them to predetermined destinations. Just like a silent servant a signage system welcomes the guest and accompanies him to his individual destination. Signage systems are an integral part of a variety of transportation, air transportation, shipping and maritime navigation. Pedestrian traffic, too, has its very own way. Some of these systems have been internationally standardized.

Signage systems in general

However, it seems that there is a lack of uniformity of navigational air traffic signage systems in any facility where a large number of people are allocated to few resources. This is especially true for air transportation facilities, such as airports, and for supporting facilities or services within these facilities. As a result of their dissimilitude, airports signage systems are far

Pedestrian signage systems in particular

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The main problem lies in the very specifics of pedestrian traffic. Regulations, by objective standards, call for any regulation to begin with, the pedestrian is very mobile: he can stop at a moment's notice, turn around, step aside or even go back. Combined with his relatively low motion of speed the traffic related risks drift towards zero. Immediate damage caused by insufficient or non-existing signage systems is not an issue - as entirely opposed to road traffic where mistakes easily lead to accidents: here an objective regularization is imperative in order to avoid dangers. This situation is reflected in the many laws and regulations established for road traffic.

Perplexing variety of pedestrian signage systems

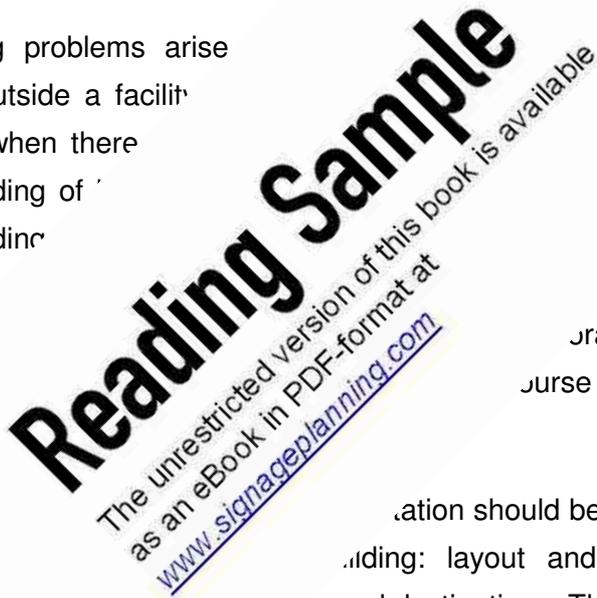
Because there are so many pedestrian signage systems it is inevitable that there are more and less effective ones. The effective ones do not catch the eye: they are inconspicuous. The user does not

Perception and implications of effective versus ineffective signage systems

encounter any navigational problems and reaches his destination effortlessly. On the other hand, ineffective signage systems stand out: deficiencies are noticeable and easy to identify. Especially exceptional situations reveal flaws in the signage system such as for example the beginning of operation of a new facility. Ultimately a guidance system is required to be able to find their way at any given exceptional situations - so that the user and disasters can be averted.

Wayfinding problems arise starting outside a facility entrance when there is no understanding of the chosen destination target. The introduction of a single target adds to the

option of the navigation task



Information should be given by the building: layout and architecture. Signs and destinations. The mapping is of similar utilities, e.g. shops are small thus visibly signaling the prospective they serve. Graphics and landmarks allow the highlighting of important intermediate targets. Only the information that could be transmitted until now should be subject to signage. It is only when architecture and structuring of the different functions fail to convey sufficient navigation information that more guiding information is required.

Architectural features and functional layout as navigational aids

The users are finding ways to adjust to the growing complexity of traffic facilities. Charter vacationers are known for visiting their departure airport a few days before the actual flight just to be prepared for the day of departure. What seems a reasonable precaution from the visitor's point of view cannot be what the operator

Users' reaction to ineffective navigation

of an efficiency-oriented facility has in mind. A facility often operating at full capacity is additionally strained by visitors who unhurriedly stroll around without being primarily interested in covering a distance within a certain time frame.

But many users are not willing to or simply do not make the additional endeavor. And as often as not they avoid navigational problems by choosing alternative transportation or another airport. Convenience emerge as additional requirements. Thus it is of course that the mentioned earlier should be taken into account.

Effective navigation as a competitive factor

An essential prerequisite for the presentation of information in a given situation is the building of a clear and concise structure. This structure arises from the requirements of the user and the situation.

Formula for successful signage systems

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The structure of the information is determined by the user's requirements and the situation. The information should be presented in a clear and concise manner. The information should be presented in a way that is easy to understand and that is needed by the user. The presentation makes communication user easy, ensuring that the user can find the information and then use it. The information can reduce the additional impact of a unfamiliar environment to a level, which the user can handle as easily controllable and unproblematic. It is this combination of subjective inconspicuousness and straightforwardness that is ultimately responsible for the customer's satisfaction, thus constituting a customer friendly facility.

Elaborate signage systems can be found especially at airports. But if these are not observed or are not explicit enough for the customer then this is - among other things - an indication for deficiencies within the signage system. These deficiencies usually result from an unsystematic data representation reflected in the general appearance of the system, but also in poorly structured and too extensive information or signs that are not positioned appropriately. Compared

Impact of signage systems deficiencies

with a signposting ideally designed to meet the users' cognitive needs this leads to the following disadvantages:

- Increased difficulty finding and selecting information
- Increased effort to understand the information
- Higher risk of misreading the information
- No benefit from previously learned syntax
- No chance of forming expectations of place of and sequence of requirements
- Impairment of facility appearance
- Higher costs

Disadvantages of ineffective signage systems

An examination of a sign building of an airport shown in figure 1 of a bank. The arrangement is that there are at least 4 signs to be made now

Practical example of an unsystematic presentation of information

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sign: Which route is to be made now to serve the visitor's needs needs to obtain additional information. In any case, the sign has

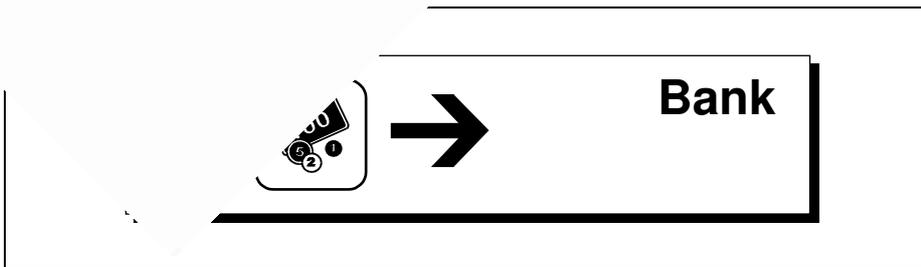


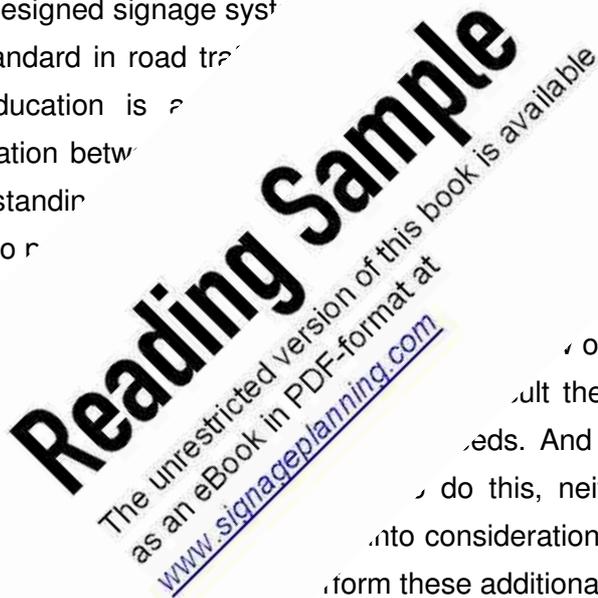
Figure 1: Directional sign at the Cologne/Bonn Airport in Germany (copy)

Well-designed signage systems inconspicuously guide the first time visitor of a facility to his destination. In order for this to happen, the crucial information needs to be offered where the visitor would expect it. The means to ensure this is the consistent implementation of a logical, recognizable signage system.

1.2 The Goal

Carefully designed signage systems have been a standard in road traffic. Driver's education is a continuous communication between the user and the understanding of the basic approach to a variety of new vehicles through

Convenience: road versus pedestrian



...of the user to adopt a new one - provided that the user has to learn new habits. And even though the user does this, neither his time nor his energy go into consideration. It might just be a small effort to perform these additional tasks.

...to customer satisfaction is the aspect of convenience. When planning a new facility much attention is given in making the route as short and direct as possible. In reality a short route is not always the best if the user will not be able to find it. For the optimization efforts of the constructional planning to serve the purpose of achieving a higher customer convenience level, the pedestrian traffic streams need to be steered effectively. This is an additional reason why an adequate level of priority within the overall planning process should be given to the design of signage systems.

Convenience: locating shorter routes

Good navigation adds to the corporate image. Being able to find the way within a facility relates to being comfortable and confident. To know where we are gives us a sense of security, which allows for further exploration of destinations and opportunities or even to search

Convenience: service

Such a standardized, →integral signage system has to represent a superior authority, encompassing all single information into a logical whole while taking into consideration the constructional specifications of the facility. Herein lies the essential distinction between manual at hand and already existing planning recommendations as the practical sign posting so far, which has single sign instead of considering the is- traffic facility, for example, a representation notes, posted by users to walls or missing information. As a result by signs.

Integral consideration of the navigation task

What exactly is aimed at the achieved state that the road many of the develop net

Signage systems in the road traffic

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at higher levels (such as operators), which takes root over of raising the claim to create an manual at hand aims at coalescing known standards and recommendations, in related fields, into a complete frame of reference in order a basis for customer friendly signage systems.

Integration of already existing standards

The multitude of various pedestrian signage systems makes it impossible to present an exemplary solution encompassing all aspects involved or a comprehensive analysis of the specific problems concerning all existing types of traffic facilities. Therefore the manual at hand deals with airport terminals as an example. They stand for complex areas encountering strong pedestrian traffic flows with a high demand for directional information by international travelers. The transparency of the methodology will allow for the

Airport passenger terminals as an example

approach and its results to be extended to other types of traffic facilities.

Based on acknowledged standards the manual at hand represents a unified, comprehensive framework for planning, realization and operation of complete and verifiable logical signage systems to meet user requirements.

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2. DETERMINATION OF THE PLANNING BASIS

2.1 Users' Groups and Their Demands

A signage system addresses the users of a traffic facility. At the airport it is primarily the traveling public who are the users representing the demanding party. But also air traffic controllers, services, public transportation and shops are users who use the facility for their business.

Determination of user groups

Figure 2 shows the various user interdependence.



Figure 2: Airport and their interdependence

The figure shows how extensively the single demands of the respective users interlock. Concentrating too much on frequent flyers and airport main functions may lead to an unsatisfactory situation for the passengers, because they might not be able to take advantage of other opportunities during their waiting time. For other visitors the airport also may not seem as appealing. On the other hand it is not wise to put too much emphasis on businesses and services not primarily related to flying as it might hamper the passenger clearance. These contradictory user demands require an accurate pondering to ensure an overall result that makes sense for all concerned parties.

Conflict of interests between the users' groups

The hierarchy sequence shown in figure 3 may help resolve the conflict of objectives.

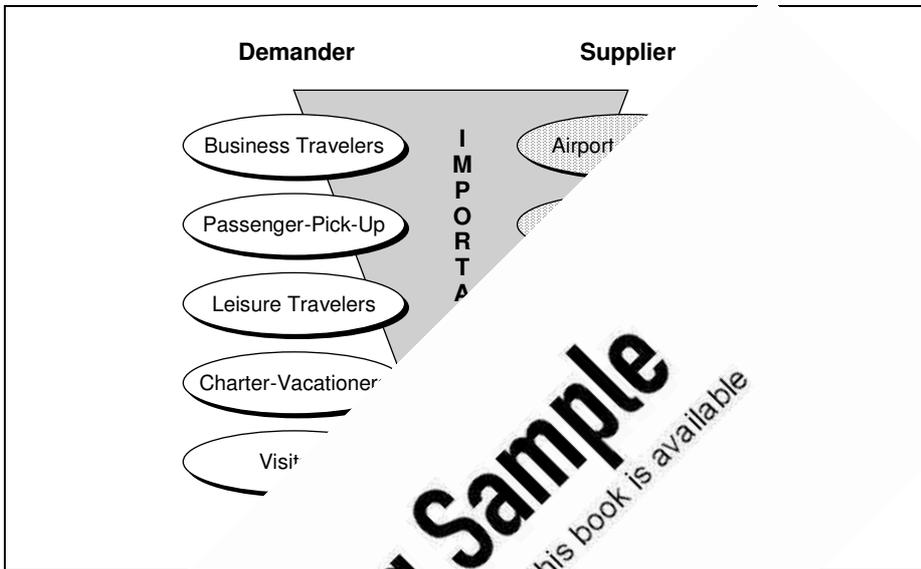


Figure 3:

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and their interdepen-
 planning of the signage

the navigational system and the

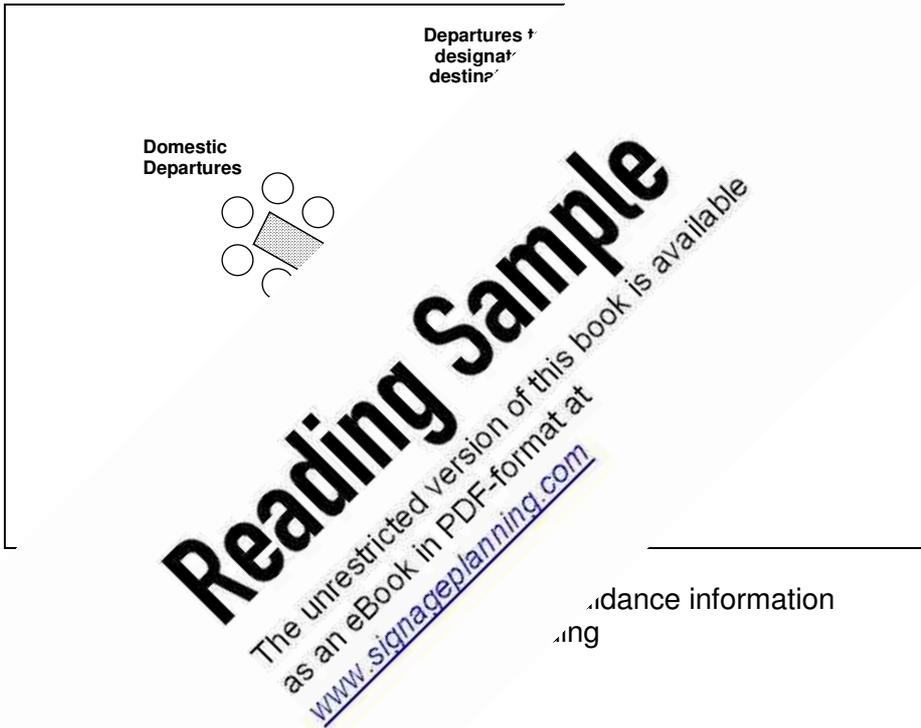
Signage is necessary wherever the needed wayfinding information can be conveyed through architecture alone. In an ideal case from the point of view of architecture - only the detailed information needs to be displayed on signs.

Architecture as a guiding system

This estimation does not hold up if the guidance is determined by complex operating procedures. Figure 4 shows the architectural structure of a building in analogy with its functional processes in a simplified example. While none of the operational disadvantages such as space consumption or lack of capacitive flexibility between each segment are taken into consideration, it represents a hypothetical possibility of reducing the need for guidance information by means of

Hypothetical possibilities of architecture

adequate architectural configuration. As soon as the traveler passes the security check the path ahead is predetermined so that he has to make very few decisions in order to reach the destination. This makes the navigational task much easier - its difficulty being a function of the number of decisions that need to be made along the way. The traveler's path is a mental effort and holds the risk of making a mistake.



These do not make sense. Thus the *Practical limitations of architecture* conveyed by architectural features is not clear. Signs such as entrance, exit, main concourse or level.

Consolidating these decisions, which were initially allocated to different places along the way, is another possibility to simplify the navigation task. Decisions need to be made at all junctions, because it is here that a change of direction is possible. In an open and spacious concourse these junctions are multiple and potentially everywhere. This is obvious when watching the pedestrians on their way in such a building. Each location of a directional change indicates that the watched person has changed the sequel of his route - possibly triggered by new information. These locations of decision points constitute the junctions along the pedestrian paths. As shown *Grouping of decisions*

in figure 5, the grouping of paths makes the grouping of decisions possible thus allowing the determination of their location. This, in turn, is an essential supposition for guidance information to be offered at the right place.

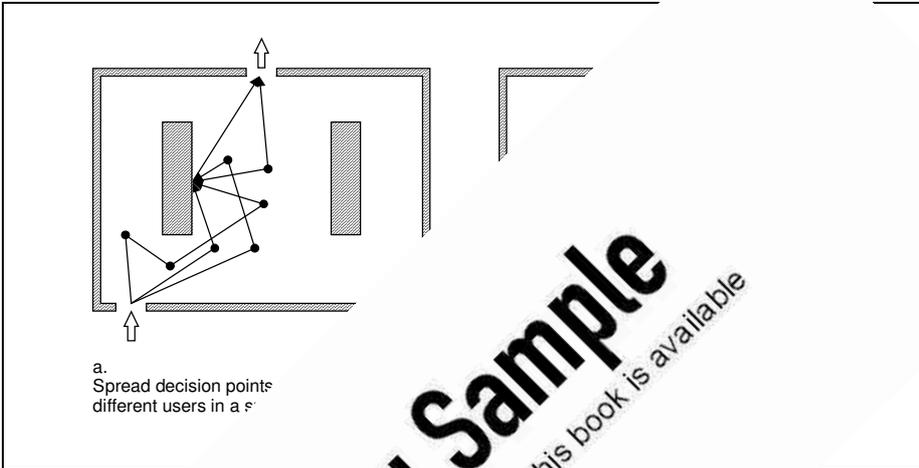


Figure 5:

of paths

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Quality simplifies both
 g needed.

...cial design the level of →func-
 s as important for the wayfinding.
 within the route correlations given by
 quence of the locations passed by should
 quence of the passengers' demands. Similar
 utiliz. travel agencies or check-in counters have to be
 clearly n. ated into utilization zones. The understanding of the
 underlying functions is compromised by mismatched utilizations that
 are out of place and have been put there for reasons not related to
 their functionality. The accommodation of shops or counters at vacant
 spots without considering a subordinate order will undo the functional
 principle and increase the need for information and sign posting.

*Configuration and summary of
 edificial utilization*

**Functions within a building need to be ordered in a sequence -
 related to navigation - that corresponds with the sequence in
 which they are needed.**

Similar functions within a building need to be pooled together location wise.

The paths between edificial or utilization areas need to be laid out in such a way that they lead pedestrians head-on towards the destination or the intermediate destination. An obstacle is not a barrier for a better clarification of the target area, but rather a sign for overlooking it. These coherences are shown by a clear and direct access. A frontal approach towards a destination leads inevitably into the path itself. In contrast to a backward access, it is difficult to be identified and a path passes it rather than the user, neither expected nor signified by signage information.

Path guidance towards the destination



Accesses¹

The same applies to facilities with multiple levels. The paths should be leading directly towards elevators or stairs. This allows for the incorporation of the level change as a subordinate target and implies a functional setting consisting of different levels. Hidden stairs or elevators are not only more difficult to be found by the user - just like a backward access - they also hamper the user's understanding of vertical path correlation.

Change of levels

¹ Arthur, P., Passini, R.

All paths must lead directly towards the target, in a manner that will simplify its perceptibility.

2.3 The psychology of wayfinding

2.3.1 Demand for information

To find one's way means to solve a problem of spatial orientation and the solution to a navigation task arises from the interaction of the destination. The solution consists of a succession of decisions along the way. Information that is available at each point is a decision point. The choice of a direction to continue is a decision. The task of a wayfinder is to solve a single target problem.

Solving of the navigation task

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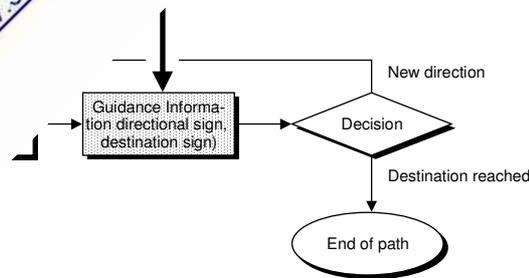


Figure 7: Solution structure for navigation problems

The problem solution takes place based on structured decision plans. These allow for the segmentation of one complex navigational task into many separate, easy to solve tasks involving only three or four steps that can be figured out effortlessly. One after another, executed in the correct sequence, these separate decision steps constitute the solution of the overall task, bringing the destination-

Executing the solution based on a decision plan

seeking individual to his destination. Figure 8 illustrates what such a decision plan would be for departure from an airport.

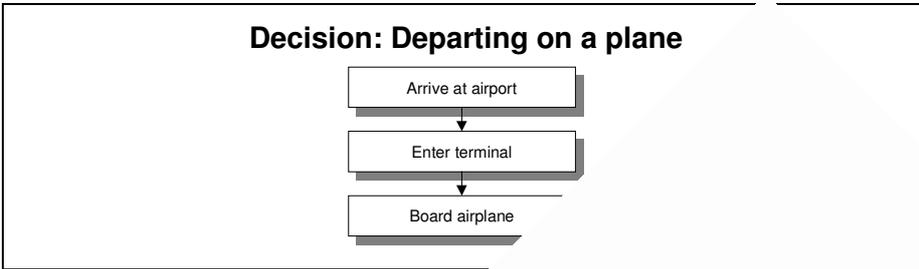


Figure 8: Simplified decision plan

This simplified structure for a larger facility a more detailed plan. The amplified decision plan is shown in Figure 9 that.

Detailing of the decision plan

...ry.
...ice for

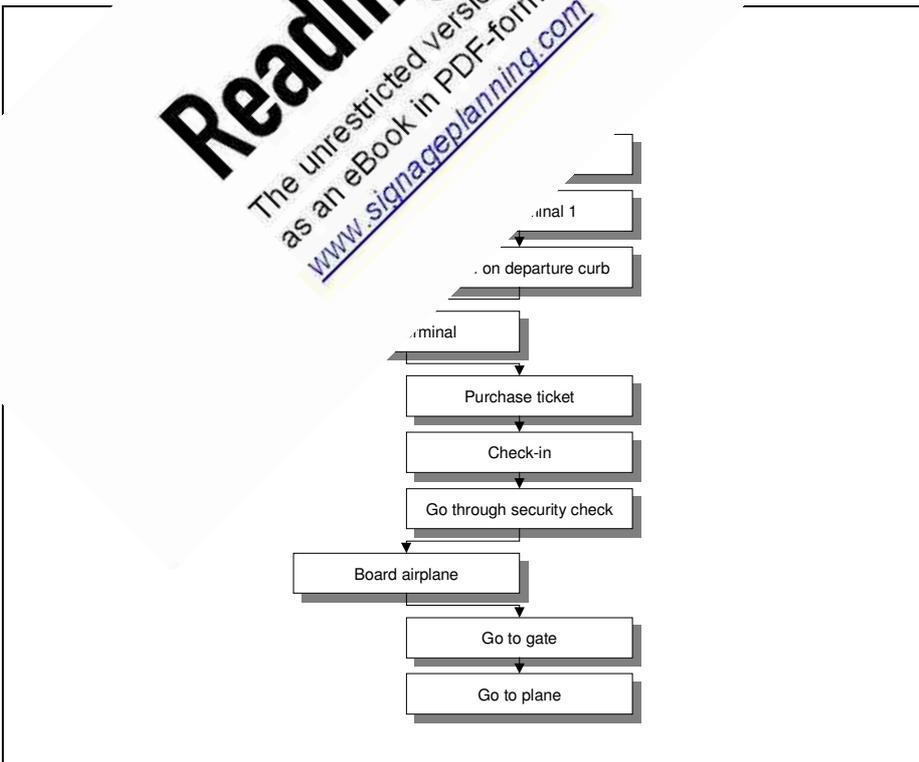


Figure 9: Elaborate decision plan for the departure from a larger airport

It is apparent that decision plans depend significantly on the structure, for which they have been appointed. Notwithstanding, it can be assumed that individuals who have the same destination will independently orient themselves according to the same decision plan.

General applicability of decision plans

In many cases the execution of a decision is performed subconsciously with both routine and knowledge having an impact. The frequent flyer, familiar with airport experiences, knows off-hand where to go to the check-in desk to the extent subconsciously. The less experienced user, on the other hand, will need a more refined decision plan. The terminal he needs to go to and the time of a problem is determined by the amount of information contained in the decision plan for all users.

Essential level of detail of decision plans

The hierarchical structure of the decision plan is a step-by-step refinement of the information. Information that is irrelevant for the user is omitted. The decision plan provides a clear indication for the user. The decision plan is relevant if the prospective user has no information about terminals and gates. The user arrives at the airport with a very limited amount of information. The user acquires the information once he gets to the airport. The necessary information will be offered to the user.

Point of time for the detailing of the decision plan

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The information provided by the signage system has to comply with the decision plans of the prospective users. The wider the chosen users' collective the more complex the information that needs to be presented. This leads to a conflict, which is not easily resolved: the presentation of all information, including detailed information for the inexperienced user, exceeds both the capacity of the information system and the receptivity of the user. An accordingly designed signage system would then obscure the important information - also for the experienced user. An advisable compromise would be to adjust the information to the average user or frequent user while incorporating cross-references to additional information resources.

Determination of relevant decision plans

(see also chapter 3.4.3 *Complementary Components*). After the chosen approach has been transformed into a planning draft, the next step could be to test if the amount of information can still be increased or if the limit of receptivity has already been reached.

The decision plans for the relevant user groups determine which information has to be included in the planning. The careful selection of this information is particularly significant.

2.3.2 Perception of Information

When moving through the environment, the perception of vision. Interactions are often temporarily interrupted or delayed successively in a short-term manner.

Process of information perception

Information overload is a task means that the user has to scan the information. This reduces the effectiveness of the information. This is why its information must be presented in a way that fits the mechanisms of the user.

Effects of information overflow

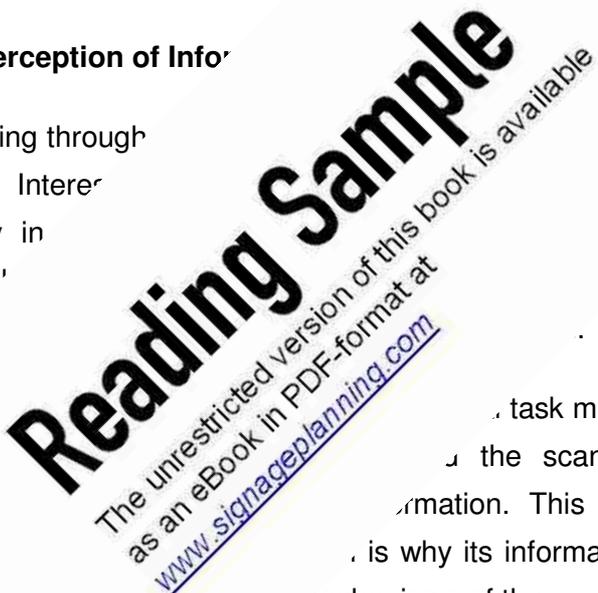
Signage in the environment the wayfinding process must be made easily identifiable as such. Its content must be clear and easy to understand. The total number of separate signs must be low enough to not compromise the process of translation. Numeric references for an adequate information amount as well as ways to reduce information are to be found in chapter 2.3.3 *Solving the Navigation Task*.

Consequences for the presentation of information

Wayfinding information needs to be distinguished from all other visual impressions within its surroundings.

The choice of location is also of utmost importance. References that seem unimportant may easily be overlooked, so that misplaced information comes close to offering no information at all. Research on

Significance of location choice for signs

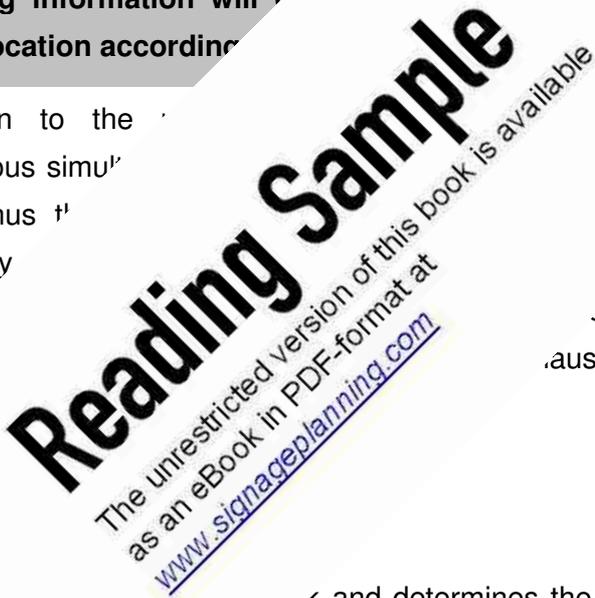


the drivers' perception of road signs has shown that, for example, a no-passing sign will hardly be noticed if placed in a complex area, where overtaking does not seem reasonable anyway. Insofar the examination of sign locations and its conciseness can also be considered a means to reduce signage under other aspects (e. g. legal), which stand against a 'Sign Posting deals with the requirements and modes of setting up signs.

Wayfinding information will be processed and relevant location according to the

In addition to the conscious processing, there is a subconscious simultaneous processing of the setting. Thus the wayfarer's perception of the setting is increasingly influenced by the spatial representation of information. The visibility of the

Simultaneous creation of an understanding of a setting



wayfarer determines the logical steps and determines the logical steps after another to reach a destination, and for the respective leg of the total route. A. single decisions have to be made whenever there is no clear one direction in which to continue the way. Also included are decisions such as: is the wayfarer still on the right track or should he turn back? Thus it is imperative that the right path be confirmed within longer segments.

Execution of the single steps of the decision plan

At all points of decision the wayfarer needs the precise information matching the respective step of his decision plan and thus allowing for his continuation on his way in the correct direction. To offer this information is the task of the signage system. In respect to contents the system therefore needs to align with the decision plan. The information needs to be posted on-site at the points of decision.

Demand for information at points of decision

Wayfinding information is required at least at all points of decision, consequently at all junctions.

These remarks can best be illustrated by means of a conceptual example. The plan is to get from A to C. The respective plan is partitioned and is shown in figure 10.

Conceptual example of use

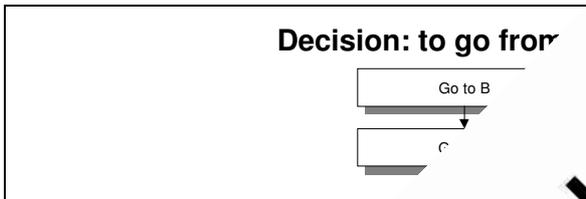
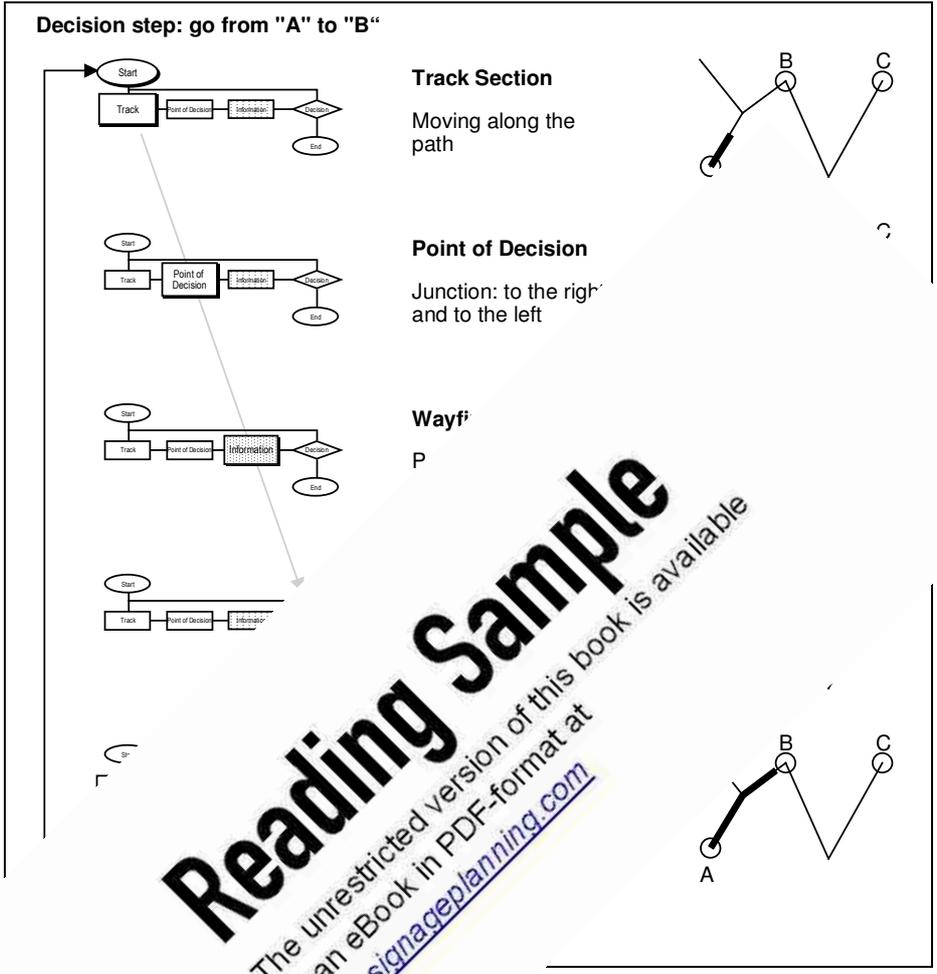


Figure 10: Exemplar

The step-by-step shown in chapter inter

plan is *Exemplary execution* discussed in simplified. Each is counterpart on ans that the first part and the next one can be

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. problems

...ie occurrences according to *one* decision **Number of decision plans**
 p... or the path from one point of origin to *one*
 desti... as a matter of fact, there is a multitude of different
 destin... be taken into account. These in turn are connected
 with each other in many different ways - traffic wise. As a result each
 significant origin-destination relation requires at least one decision
 plan, often even two decision plans: one for the way there and one for
 the way back. As shown in figure 12, in the worst case three
 independent decision plans will require just as many wayfinding
 references at one joint point of decision.

Each significant origin-destination relation requires at least one, even two decision plans: one for the way there and one for the way back.

The consequent realization of this requirement v easily surpass the amount of information that can be a signage system (see chapter 3.3.3 Amo' decision plans, designed according to t' be conjuncted by the planner of suc' allowing for as many plans as information at as many poir flexibility of design is a d' decision plans, which Figure 12 illustrate .ain the joint parti' .mation Terminal m of all th' of the track part' , general to the decision plans, which 3.3.4.1 Locations).

Consolidation of decision plans

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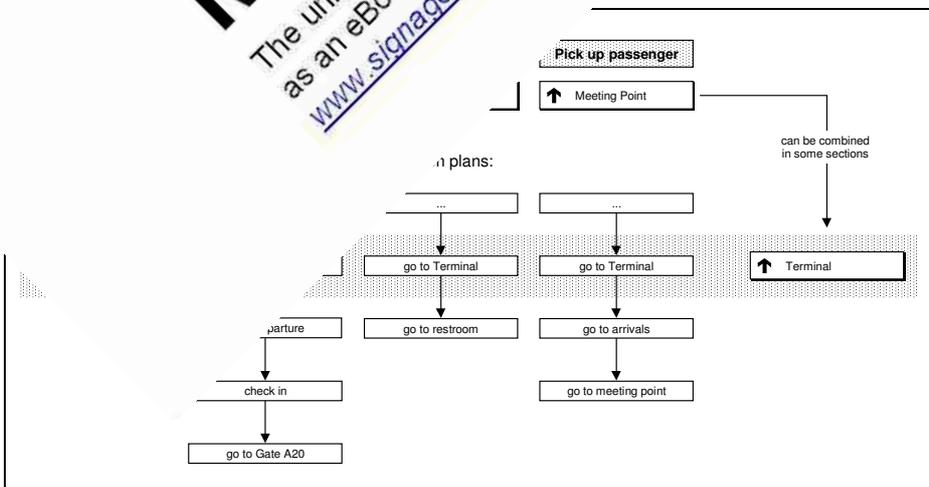


Figure 12: Consolidation of decision plans

Searching out the similarities between the different decision plans of the users helps reduce the demand for sign posting significantly. As a rule, this can be accomplished by retarding the transition from general to more specific information.

2.3.4 Destination Webs

→ Destination webs are known to be an effective tool in road traffic systems to check the expediency and continuity of directional roadside signage systems. The very same method is generally applicable for signage planning, too.

Purpose of destination webs

In the site plan destination webs form which identical content is graphically connected to a destination, such as, for instance, a station. Figure 13 contains a road network cutout showing all roads which are to be posted.

Forming of destination webs



Figure 13: Example of a destination web in road traffic

Shortcomings within the sign posting logic are visible as disruptions. In figure 14 the turn-right-sign is missing.

Display of shortcomings in a destination web

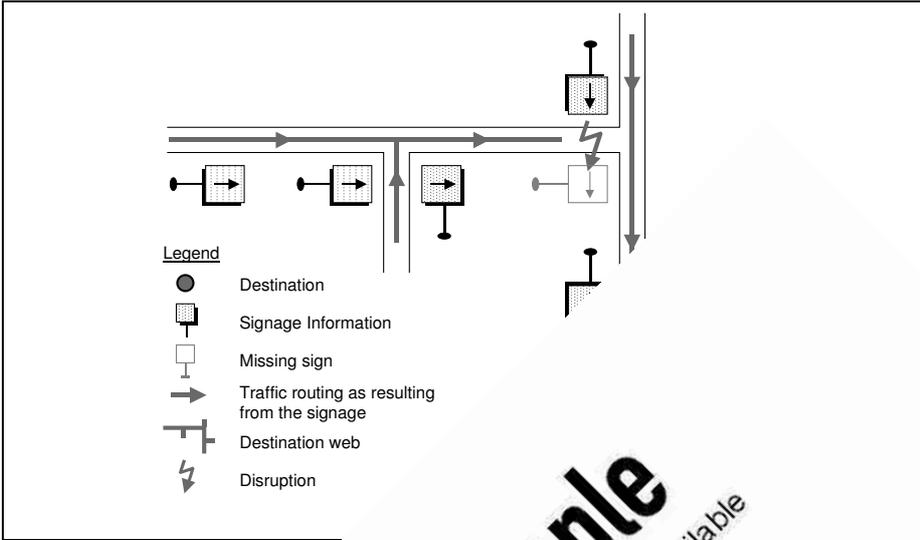


Figure 14: Depiction of traffic routing and signage information

Destination
compr

logic and

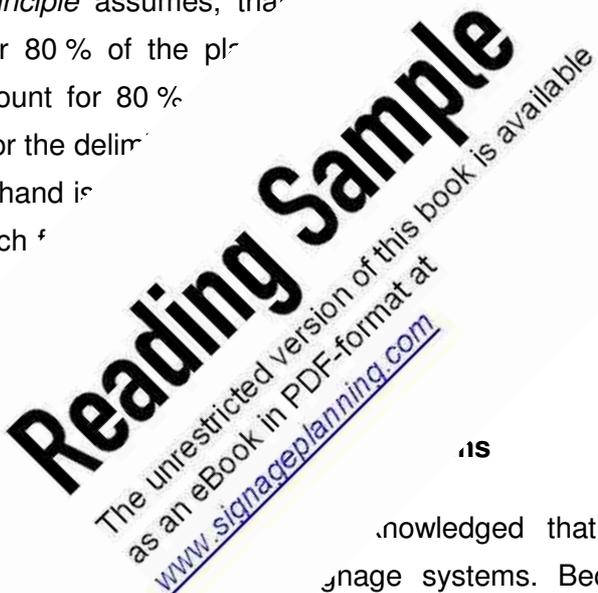
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3. RECOMMENDATIONS FOR PLANNING

3.1 General Remarks

First of all it is necessary to determine to which practical planning cases can be taken into consideration. These recommendations. Ideally, each eventuality should be considered because of their multitude this is not possible. In the exceptions discussed the need for regulations is so that the practicability and clarity of the *Pareto¹-Principle* assumes, that the first few rules cover 80 % of the planning cases, which would account for 80 % of the total objective for the delimitation of the manual at hand is to consider the most important cases, which are the most frequent. To ensure this a fundamental set of rules and detailed regulations is required.

Considered planning cases



is

It is well known that there is a fundamental need for signage systems. Because of an attitude towards the customer well-being are being taken into consideration as a priority when a facility is built or reconstructed.

Fundamental need

Existing signage systems consistently cause considerable indirect cost. At the same time the additional cost is hard to determine and hard to quantify, which is why it often remains concealed over years. Inquiring visitors for example, who ask for the way and thus disrupt the working routine of the employees cause additional costs. Such disruptions have a negative impact on the work capacity and consequently lead to a higher manpower requirement. According to a study a medium sized hospital has spent four man-years per year just on inquiries for directions and explanations of signs. Another

Reduction of indirect cost

¹ Vilfredo Pareto, italian economist (1848-1923)

occurrence causing additional costs are meandering visitors or passengers, who remain on the premise of a facility for a longer time than is necessary. This in turn may lead to a situation calling for more space and eventually extension work.

Direct cost disadvantages resulting from inefficient signage systems are easier to calculate. The logical structure of a signage system allows for a maximum of information communicated by a minimum of signs. This is economized by not being perceived as clutter. Based on the research, on the one hand, the researched cases show that even though the offer of a signage system is not a primary concern, additional economic and flexibility advantages result from the coordination of a signage system.

Reduction of direct cost

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...unity resulting from a signage system over a long period of time. Efficient signage systems, which can take any form, allow for a differentiation of segments, which in turn lead to a better utilization of space and someplace else.

... only fulfill both security and help the operator of the facility cut

3.3 Signage System Requirements

3.3.1 General Requirements

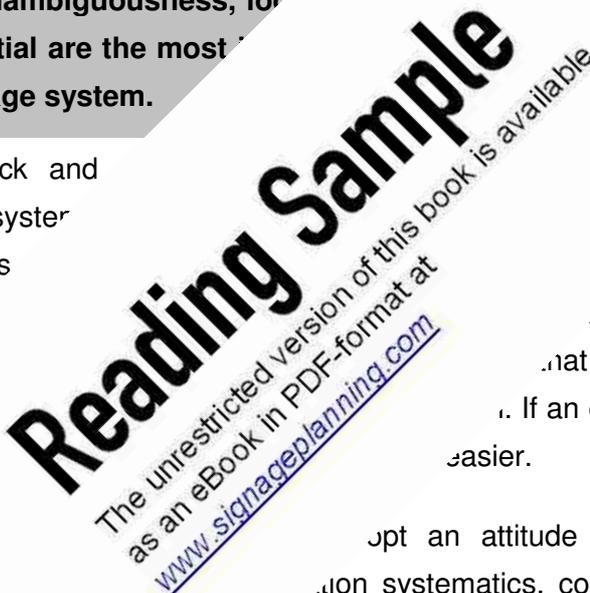
From the point of view of traffic, the sole task of a signage system is to help its users situate themselves within their respective spatial environment and assist them with their perception as well as with the location of their respective destinations. Whenever the architectural configuration does not fulfill these requirements, signs need to take over.

Tasks of Signage Systems

To ensure this, it is necessary to provide an easy to understand and easy to perceive exhibit of information, which takes into account the situational context of the wayfarer. Clarity, unambiguou rness, logic, dependability and reduction to the essential arr esulting requirements to be fulfilled by the signr The implementation of these demands has to withr well as it should take into account k perception.

Requirements for the presentation of information

Clarity, unambiguousness, logic, and reduction to the essential are the most important requirements by a signage system.



For a quick and signage system systematics expectation exper fr

on, nable practical forming of that drivers react . If an expectation is easier.

Perceptible Systematics

upt an attitude of expecting on systematics, consistent color signs. Only if this is the case the user anticipate information and what it will look role to recognize information before he can actu

Creation of Expectation

Signage systems require a perceptive systematics to base upon, so that the user anticipates the location of information as well as its appearance.

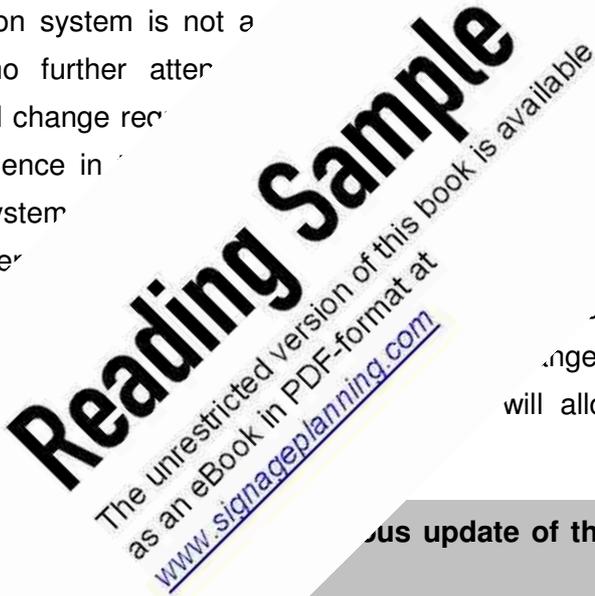
A frequently observed attempt to visually integrate signage systems into a given architectural representation compromises a swift locating of information. The outcome being signs, which most often are more difficult to locate and are non-consistent in design. Even though their functionality is lessened in favor of the adjustment to the architectural context, they still look out of place. A rethinking of this signage policy

Architectural Integration of Signs

seems advisable. Signage systems need to be recognized as independent functional units of pedestrian traffic facilities i. e. doors, emergency exits or the heating and air conditioning systems are integral independent functional parts of a facility. In order to optimally fulfill their function, signage systems need to fit into their environment without coming to the fore too intr

When signage systems are blended with architectural features, their impact is compromised

A navigation system is not a... requires no further attention... utilizational change requires... Any negligence in the design of a signage system... that the user... way to... cons'... r



ance Requirements

...ie... on to... us giving... mechanical... anges requires a... will allow a flexible

us update of their contents

... basic rules is the →rule of continuity. It... n, once taken up in the signage system, ... and in fact needs to be displayed on every follow... it is reached. Thus the continuity rule attains two goals: first ensures a close guidance of the user thanks to information offered at decision points and to affirmative references placed strategically at intermediate locations. On the other hand it is - if applied correctly - an important means to maintain a continuous control of one's path: if the destination does not appear on the signs anymore then this is evidence for either having left the right path or having overlooked the destination.

Rule of Continuity

Thus it is obvious what the consequences of non-observance of the rule of continuity might be. Missing guidance references hold two

Reliability

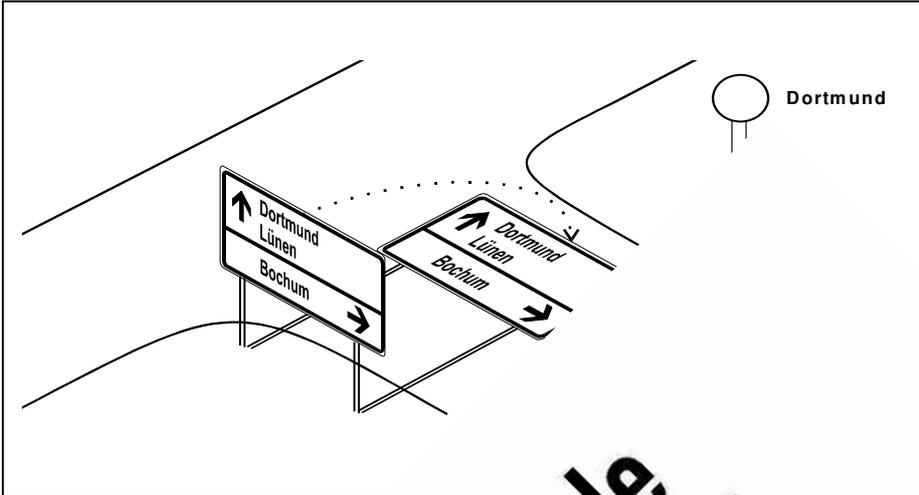


Figure 15: Flip-down

Distant destination

According to

close

Rule of unambiguity

to a destination
parallel routes must
ation of this rule is the
different routes to one

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There must be no more than *one* route
on the sign (rule of unambiguity).

3.3.2.1 Contents

3.3.2.1 Terminology

The terms designated to destinations need to be short, clear and concise to allow for a quick perception. Words consisting of more than 20 letters as well as uncommon abbreviations should be avoided. The terms need to correspond to the users' everyday language. Any terms relating to specific areas of expertise should be replaced.

Conceptual Conciseness

Because of the above reasons proper names should not appear in the signage systems, but should be substituted by adequate generic

Avoid Proper Names

terms. If this is not possible due to comprehensibility then it is recommended to represent the item within the logic and layout of the signage system rather than the company's own graphic representation.

Destinations should be designated by complete and unabbreviated terms, names should

3.3.2.2 Multilingualism

The needs of foreign users
pictographs, which will
Appliance of Pictographs
has to be assumed
which is why
should be
countries
such

International customers

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age,
terms
-speaking
in the signage,
and for it. In the
will be assumed to be
ent a second language.

**International traveling public
terms in addition to the national
ely known by the users. In English-
ditional language might be advisable.**

3.3.2.3 Breakdown of Edifical Structures

The logical breakdown of large edificial complexes into buildings and sections allows for a distinct determination of location (i. e. Gate B7) and makes spatial orientation easier as main destinations can be defined (i. e. Terminal 2, Section B). Attitudes of expectation carried forward from related fields help understand the building identification in the overall context. By taking over familiar patterns when identifying buildings these expectations are fulfilled.

Breaking down large facilities

The top aggregational level of an airport facility is the terminal. As shown in figure 16, the respective terminal buildings should be numbered in ascending order, beginning with 1, according to the order in which they are made accessible from the roadside. Identifying terminals by points of the compass is not recommended as these perplex users with spatial orientation problems. If terminals, with proper names, they are difficult to list. The number is only the countable denomination that is not related to one's own location with respect to the terminal. The destination thus indicating if the terminal is overlooked.

Identification of Terminals



in ascending numeric order

The terminal consists of structurally defined areas such as check-in, baggage claim, and waiting zones or just a continuous repetition of architectural elements. These sections need to be identified within the terminal according to figure 17: beginning with A, ascending in the order in which they are reached when arriving at the airport.

Identification of sections

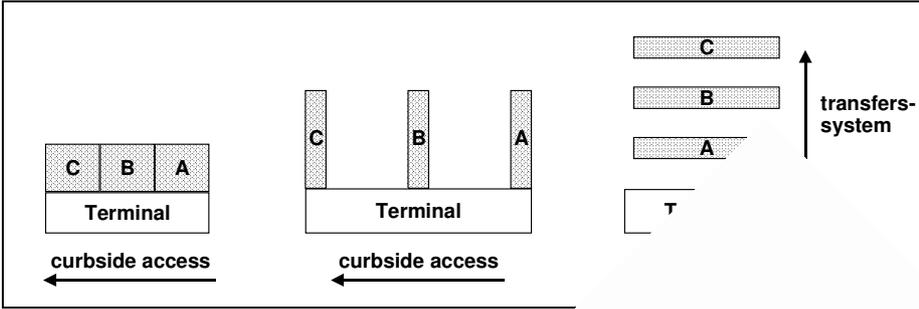


Figure 17: Identification of sections

Structural sections need to order corresponding with

Each terminal needs a departure gate numbering, starting from the terminal. The numbering should increase from left to right.

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No consecutive identification of departure gates

It is recommended that the departure gates be identified in a way that is not redundant. As a result, the gates should be identified in a way that provides their customers with the most information. The passengers should then be able to find the departure gate, and then for the departure gate, the departure gate. If this were the case, it would be necessary to incorporate the departure gate numbering system at an early stage with the signage system. This is still essential. This disagrees with the position that the changeover from the general to the specific information should take place as late as possible.

The departure gates as the lowest hierarchic level need to be numbered within each terminal or section, beginning at the left-hand side in oblong sections according to running direction. If the departure gates are located on both sides of the running direction then even numbers should appear at the right-hand side, odd numbers at the left-hand side. This recommendation takes into account the reading behavior (from left to right) as well as common practice of allocating house numbers along streets. This is shown in figure 18, along with

Identification of departure gates

the combined realization of the remarks on building and section identifications.

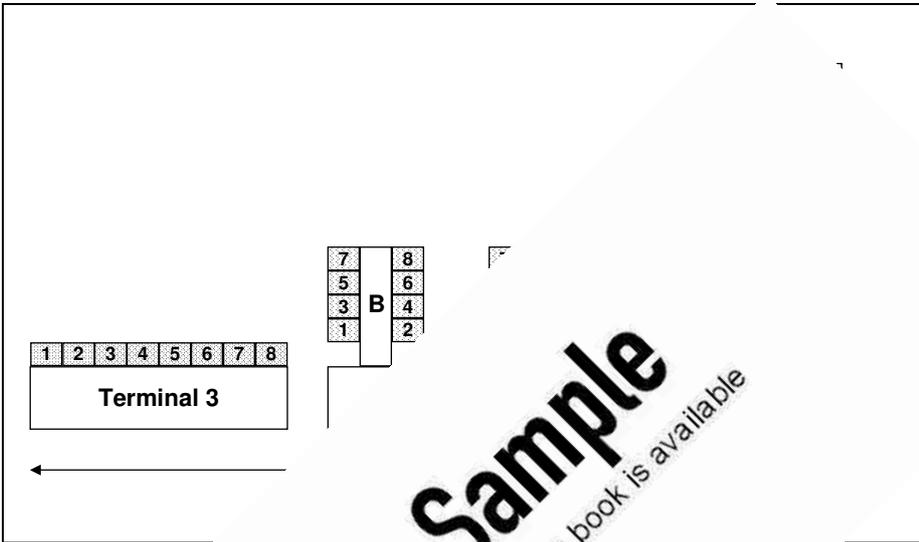


Figure 18:

arture

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...on, such as departure
 ...to the reading custom in

...ise and unambiguous destination
 ...s *Departure Gate* are added. In a multi-
 ...section identification can be incorporated
 in...e identification, thus forming an alphanumeric
 term. ...n just one terminal an identification of the terminal
 is not ne...y. In table 1 the identification systematics for typical
 airport layouts are pointed out.

Composition of destination terms

	one terminal	multiple terminals
compact terminal no diverse departure areas	Departure Gate 7	Terminal 3, Gate 7
structured terminal diverse departure areas	Departure Gate B7 - or - Section B Gate 7	Terminal 1, Gate B7

Table 1: Exemplary designations of

Unambiguous destination terms for the buildings and sections should be avoided.

Just like the destination terms have been standardized, the designations for the buildings and sections should be consistent. All employees should be aware of the need for consistency in the respective buildings and sections to this standard. It is important that the signage throughout the airport recognize his target.

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Consistent Communication of the Destination Terms

Destination terms for the buildings and sections should be communicated reliably throughout, i. e. at the airport plans, brochures etc.

3.3.2. Destination Directory

All targets, which have to be included in the signage system, need to be listed in a directory of destinations after the identification terms have been decided upon. The destinations need to be subdivided into main and minor targets according to their relevance for the facility.

Establishing a Destination Directory

Referring to an airport the main targets or → primary targets are those, which are essential for the proper operating of the facility. Such would be Ticket Sale, Departure, Arrival and Baggage Claim.

Main targets

	Baggage Cart <i>Gepäckkarren</i>		Mail box <i>Briefkasten</i>
5	Baggage Lockers <i>Schließfächer</i>		Meeting Point <i>Treffpunkt</i>
15	Bank <i>Bank</i>	34	Men <i>Herren</i>
6	Bar <i>Bar</i>	39	Nur <i>Nur</i>
7	Barber Shop <i>Herrenfriseur</i>		
9	Beauty Salon <i>Damenfriseur</i>		
12	Cashier <i>Kasse</i>		
13	Coat Check <i>Garderobe</i>		
14	Coffee Shop <i>Café</i>		
18	Drinkir <i>Trink</i>		
19			
			Stamps <i>Briefmarken</i>
			Telegrams <i>Telegramme</i>
		49	Telephone <i>Telefon</i>
		52	Waiting Room <i>Wartezimmer</i>
		54	Women <i>Damen</i>

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Table 3: Hierarchy of secondary targets (English and German)

The classification of information offered into primary and secondary targets is an effective means to reduce information, insofar as it allows for purpose-related preselection by the user. The numeric comparison makes this clear: 58 destination terms are subdivided into 24 primary and 34 secondary targets. This subdivision needs to be reflected in the presentation of information in order to ensure a direct benefit. The user has to be enabled to expeditiously make the same preselection of the offered guidance information. In practice this is

Advantages of classification

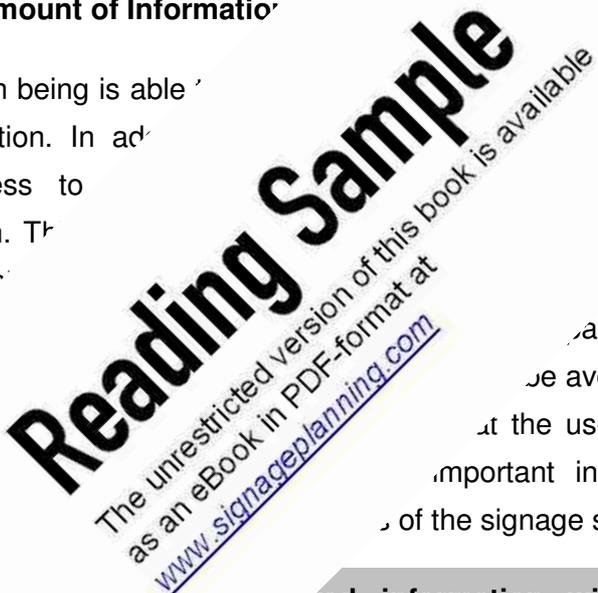
achieved by presenting primary and secondary information in different colors (see chapter 3.4.2 *Color*). As soon as the user has realized in which graphic rendition his target will be presented, he only needs to look out for guidance information displayed in the sign as he continues on his way.

Diligently compiled target directories for all targets constitute the basis of signage

3.3.3 Amount of Information

The human being is able to process a limited amount of information. In addition, there is a certain unwillingness to process too much information. Therefore, the amount of information must be limited. Refer to the literature on this topic and avoid clutter. Clarity is essential. At the user should be able to find the most important information. A clear and concise design of the signage system.

Necessity of limiting the amount of information



Presented information with maximal clarity is a prerequisite for quality of the signage system

In the design of signage, the issue of actually processable versus reasonable amount of information is the crucial one. The opinions on this issue diverge, although approximately 3 to 5 information units per sign and direction is the value that emerges in literature on this topic. In anticipation of chapter 3.5.5.1 *Appliance of Pictographs* all respective information elements regarding one destination are considered to be one unit because they are identified as belonging together and thus constitute a joint information reference.

Acceptable amount of information

Information has to be pooled together according to directional groups. As a rule three references per directional group should be the maximum, in certain cases four references might still be acceptable.

Amount of Information per directional group

To follow the recommendations of the upper limits per guidance information described in this chapter is the greatest challenge when planning a signage system. They refer to an ideal condition and form the target objective for the planner. He should be aware of the fact that each exceedance of the maximum values might have a negative impact on the quality of the signage system. The methods illustrated in chapter 2.3.3 *Solving* should be possible to reduce the amount of signage. In the planning avenues to comply with the recommendations cannot be ruled out that in practice it might happen when it makes sense to exceed the limits. The methods to avoid otherwise neglected signage are involved in the decision-making process. On his experience, the planner should be able to identify the signage system.

Exceptions

3.3.1

?

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The system's response to the decision plan as basis for destination web... they make sure that the signage information at each decision point so... his way. This is why the definition of... based on the relevant decision plans, ...ation planning. Figure 19 shows the impact of decision plans into the vocabulary of concepts of the principal jet directory as shown in table 2 for departing and arriving passengers at a typical airport. This decision plan varies in depth, width and succession depending on the airport just as much as the decisions which have to be made depending either on the access road or the buildings.

Decision plan as basis for destination web

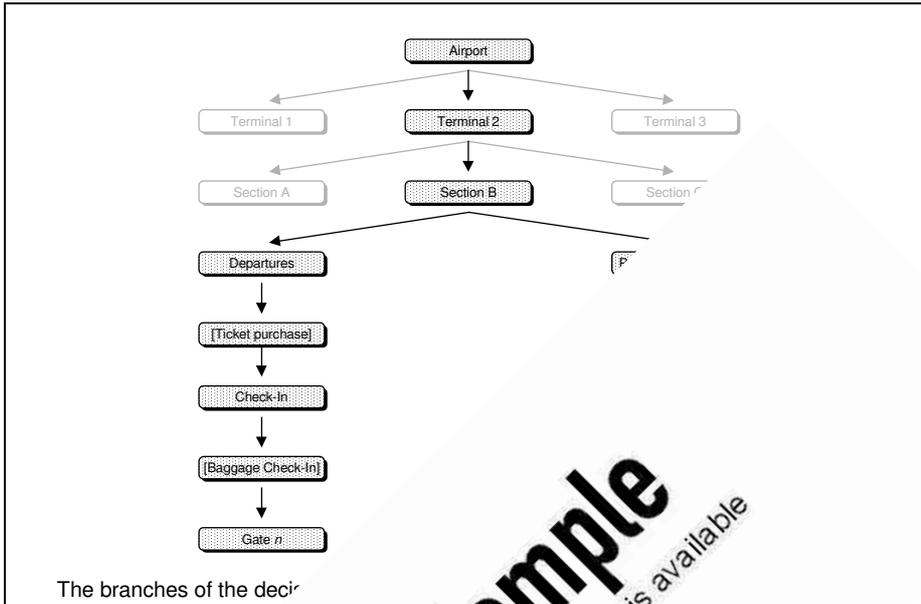


Figure 19:

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The

..., at which section ... played. According to ... Terminal 2 has been ... destination terms *Departing* ... Destinations in brackets are an ... destinations are not necessarily ... be placed additionally between the ... and after. At this point it is pertinent to ... will safely find his way back to the main path in order ... according to his decision plan. If the terms *Check-in*, *Baggage Check-in* and *Seat reservation* are contracted into *Check-in*, then it is sufficient to display *Check-in* as the first destination of a decision plan. Again, it is recommended to abandon guidance information in favor of information reduction if the destinations will be passed unavoidably.

Derivation of the destination web from the decision plan

The respective steps of a decision plan define the beginning and end of the destination web.

Destination webs are formed by connecting the starting point and the end of sign posting along the main paths, as derived from the decision plan. Each sign location within these paths needs to include an adequate reference. All these references put together make up the contents of the respective signs. Thereby it is possible to exceed the maximum number of information per sign or to exceed the maximum allowance of references needs to be reduced. This can be achieved by other routes or by the shortening of the decision plan allows for additional information). Further contents by increasing the destination. Conversely, the number of signs available for additional information can be increased (in particular) or reduced to be incorporated.

Forming of destination webs

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of origin and end point are along paths.

At all decision points alongside the route is extensive in length then signs also have to be placed between decision points so that they allow for a verification of the route. The signs should be posted in such a manner, that at each sign location the next sign is already visible. At the same time the danger of losing the way in very spacious buildings can be reduced. Depending on local visibility and complexity of the route, the intervals at which signs are posted should measure between 25 and 100 m.

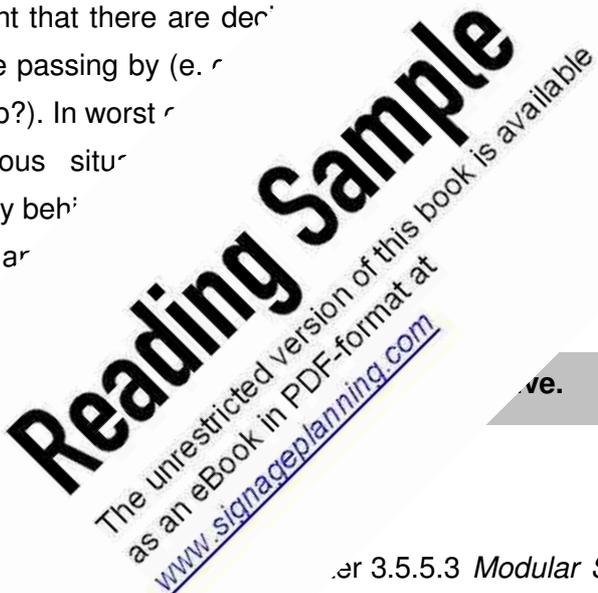
Choice of sign locations

Signs need to be posted at all junctions and, if the route is long, at intervals of about 25 to 100 m to allow for verification of the route.

In addition, it is important to provide sufficient space in front of the signs to make it possible for the visitors to stop for a closer look at the sign without causing a negative impact on traffic flow. Two reasons make this necessary: first, there is always the presence of user groups (such as seniors, foreigners, inexperienced drivers with impaired vision), which will have difficulty in taking a fairly short period of time, despite their intention. Second, the signs should always be placed in a way that means that at this point the decision to stop has already been taken into account that there are decisions to be made while passing by (e.g. at a coffee shop?). In worst case, this leads to dangerous situations where drivers immediately behave in an unsafe way at the end of a road or at the same time.

Imperative space provision

Sum... ve.



Section 3.5.5.3 Modular System gives a mounting height of 16 cm. According to chapter 3.3.3, the total amount of information on one sign should not exceed the incorporation of six information units, one information unit calls for a height of 96 cm. To avoid resulting spatial constraints, it is recommended to adopt a rule for the mounting elevation: the bottom line of the sign should be 2,20 m above ground. Thus the resulting range of elevation for the mounting of signs would begin at 2,20 m and extend to 3,20 m above ground. The benefit of this low maximum height of the sign's upper edge is that based on a legibility distance of 15 m (see chapter 3.5.2 Lettering) signs thus posted remain in the field of vision of the onlooker for a relatively long time, as illustrated by figure 20.

Mounting elevation for overhead signs

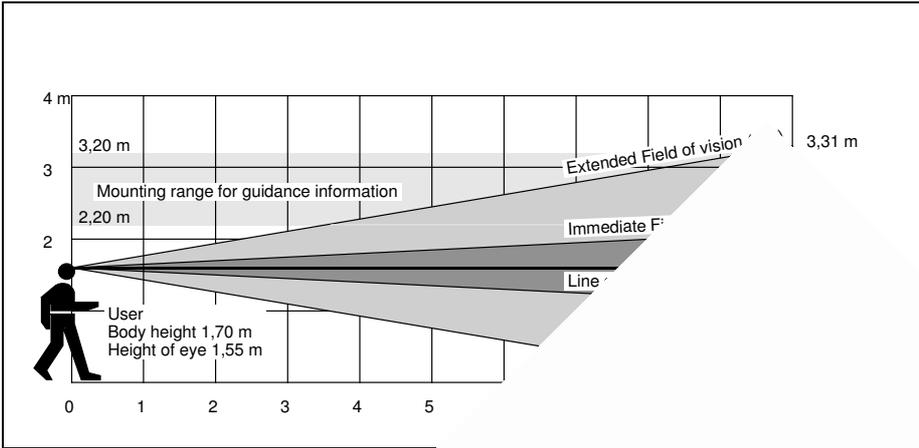


Figure 20: Mounting height

Overhead signs
 between 2,20 m and 3,20 m
 the sign at 1,70 m

In traffic
 level

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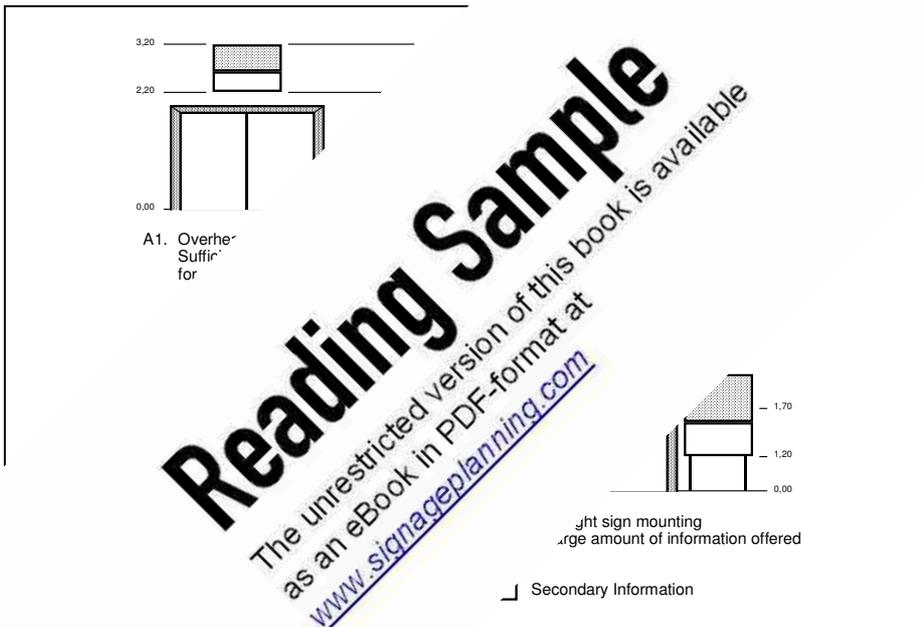
Mounting heights for eye-level signs

Signs should be posted within a mounting range from 1,20 m to 1,70 m above ground with the upper edge of the sign at 1,70 m at all times.

Figure 21 shows the implementation of these recommendations depending on the amount of information and the sign space available. For the overhead sign mounting there are two possibilities to be considered (see row A): a wall-mounted application over a passage or a ceiling hung application above the pedestrian traffic flow. For each hierarchy of information (primary, secondary) there needs to be at least one separate information panel considered (A1). These

Sign posting possibilities in practice

panels can be displayed side by side (A2), depending on the information amount and sign space available. In compliance with the recommended maximum amount of information it might be necessary to put up several panels of one group (see figure 6.10 on right). Row B shows the implementation of mounting recommendations on posts. Small information amounts may be mounted in the designated range of height (B1). If this sign should be expanded upwards (B2)



Jes

When a sign is mounted overhead, the display space can be expanded upwards. When mounting a sign at eye level the display space may be expanded upwards even beyond the recommended mounting height range.

There must not be any other distracting information displayed which competes with the guidance signage, although a uniform signage system already reduces the risk of this happening considerably. Notably, it is the commercial advertisements, which should be designed concisely and thus stand out due to their distinguishable design. At a European airport (Munich, Germany) this problem had been solved by assigning a trapezoid and mostly externally lit

Exclusivity of signage information

modular system for wall advertisement. At railroad stations in Germany, on the other hand, a minimum distance between guidance sign and advertisement sign is required, complying with three times the height vertically and one sign width horizontally. In addition, it is prohibited to relate any advertising information to the railroad as far as design is concerned. A reserved area must also reserve the pre-set range of mounting height and must be reserved only and to provide for advertisement elements.

Appropriate directives need to be placed at a distance greater than the actual guidance distance. The sign must be placed close to it neither spatially nor temporally.

Perceptibility has to be considered in all situations or blurring of the sign. The costs. The sign can have a negative effect on the environment, especially in the case of advertising signs.



Sign lighting is an important aspect of sign design. It should be considered at all times. Signs can have a negative effect on the environment, especially in the case of advertising signs. This is why many represent state-of-the-art technology.

Signs should be designed to achieve the best recognizability and legibility.

Signs can be divided into →directional signs and →destination signs. Directional signs are posted along the way and lead to the destination. A destination sign marks the logical end point of the signage chain leading to it. Directional and destination signs need to correspond with each other by form and design. As shown in figure 22, the only difference in content is the absence of an arrow in the destination sign.



Figure 22: Directional and destination signs

Directional signs and destination signs

The panel shape of directional signs is rectangular, which identifies them as directional signs. The panel shape of destination signs is triangular, which identifies them as destination signs. The panel shape of directional signs is reserved for directional signs, as well as the facts about the destination. Attention to a compact shape can be perceived quickly and the recommendation resulting from this information units one above the other and vertically. It is definitely not advisable to use directional signs.

Shape of the information panel

Single information units need to be pulled together horizontally and vertically into compact signs, which can be perceived at a glance.

Primary and secondary signage information can be put together in one sign if considering the recommendations in chapter 3.5.5.2 *Order of Elements*. Because of the different principles of design a sign within a sign forms. With respect to the limitation of information amount on a sign (see chapter 3.3.3 *Amount of Information*) each sign has to be viewed as a separate sign.

Combined signs

3.4.2 Color

The color recommendations developed in this chapter refer only to letter and background colors on the signs as relating to perceptibility aspects. The application of colorcoding, such as the frequently encountered application of different colors in order to indicate different levels in parking garages, will not be discussed. It should be noted that this area of application has a high importance of color as an orientation aid.

Range of design for letter and background color

A reason for this critical evaluation is the limited number of colors, which

Conditions of colorcoding

account the layman's perception.

The number of used colors should be limited to avoid misinterpretation.

red might be used for fire exits, but a bright red might be hard to see in dark environments.

Another

fact, is the fact that some people suffer from color blindness.

Color blindness, retentivity

The color coding system would thus be less effective for these users. Furthermore, the intuitive

recognition of colors individually, so that in consequence

it is difficult for them to identify locations such as *Level*

or *Terminal A*. A parent reason why colorcoding should be

used is the possibility of numeric identifications (*Terminal A*). On the other hand, it is not possible to integrate colorcoding in signage systems.

The benefit of colorcoding as an orientation aid is often overestimated. The choice of color should depend solely on the aspects of the physiology of perception.

The choice of color should hence be based mainly on the criteria of *perceptibility* and *legibility*. Perceptibility accounts for a sign's distinctiveness within its environment, whereas legibility refers to the contrast between the color of the letters and the color of the background. For that matter it is the combination black/white that provides the best contrast effect, closely followed by the combination

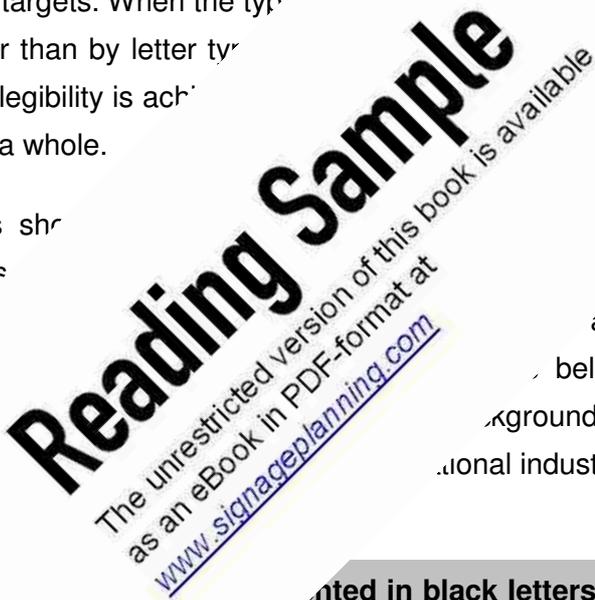
Criteria for the choice of color

black/yellow. Another rating aspect is the attention grabbing effect of both colors with yellow being better than white. Research claims that this fact can be quantified by the following statement: a white sign has to have a surface which is bigger by 9 % than the surface of a yellow sign in order to achieve the same perceptibility.

Because of its attention drawing quality, its slightly weaker contrast effect, the color is more important for primary targets. White is more important for secondary targets. When the type is chosen by color rather than by letter type, consistent legibility is achieved for the system as a whole.

Color recommendation

The colors should be black. This is a light-colored background. The colors should belong together on a same-color background. The colors should follow national industry standards,



Positive pattern

presented in black letters on a yellow background. The colors should be black on a white background.

This recommendation is artistically neutral speaks for itself. As a light and neutral color, yellow can be incorporated in almost any environment as can white as a non-color.

Creative neutrality

3.4.3 Complementary Components

3.4.3.1 Necessity

The limitation of offered information to a specified amount calls for a selection of information and a restriction to the essential. The consequence is that not all information, which could be requested, can be included in the signage system. An effective concept, though, ensures that 80 % of the demanded information is supplied by the signage system. The remaining 20 % of the potential questions are

Necessity

left unanswered. This is why complementary information should be incorporated directly into the planning as an integral part of the signage package. What this is exactly will be discussed below.

The less important information, which could not be included in the signage system because of restrictions on the amount of information, should be offered

3.4.3.2 Maps and Indexes of Buildings

Maps and building indexes provide

Maps make it easier to understand

and fulfill a general

chapter 2.1 *Users'*

directories the

since they

maps are

decisions

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the
each
together the
of general
information and
ing of the facility as a
steps of a more detailed
g. locating a certain section
be checked-in. If offered this
early stage the user will not have to

Maps should be placed at regular intervals along the main traffic stream as close to decision points as possible. At all main entrances, as well as at all significant junctions, the buildings indexes should supplement the maps. The maps should be laid out and located in a manner ensuring that users who stand in front of the displays do not present an encumbrance to other users.

Locations

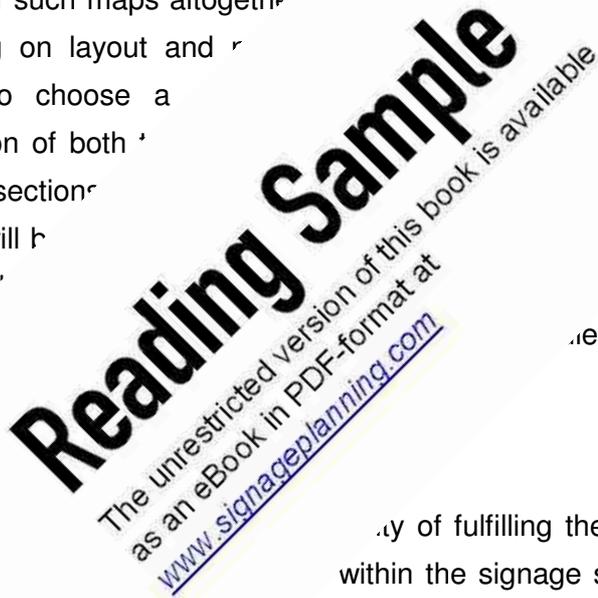
Buildings indexes with layouts are best placed in internally lit display cases. If dealing with the matter, these displays offer the possibility of gaining insight into the spatial organization of the facility. The languages chosen for the directories have to correspond with those of the signage system and have to be sorted alphabetically each. Along with each target its location should be displayed and described

Implementation

systematically with its depiction matching the one in the map. Pictographs should only be used within the map itself and solely in connection with the buildings indexes. The pictograph within the map will also meet the demands of international use and point to the target according to its depiction in the listing.

The map itself needs to be as simple as possible, showing only the essential shapes of buildings, so that they can be easily recognized. Areas which are not shown on the map should be kept out of such maps altogether. Depending on layout and space, it is necessary to decide whether to choose a pictograph or a text designation, or a combination of both. The pictograph should be placed in the buildings' section of the map so that the user will be able to find it easily. The text designator should be placed in the map near the building.

Design



The location of the sign should be chosen so that it is easily visible and that it does not obstruct the way. The sign should be placed at a height that is easily visible and that it is not obscured by other signs or objects. The sign should be placed at a location that is easily accessible and that it is not obscured by other signs or objects. The sign should be placed at a location that is easily accessible and that it is not obscured by other signs or objects.

Location

In addition, the location of information desks is more and more taken over by hosts. Hosts move around freely within the building and thanks to their uniform they are easily identified as competent contact persons. Hosts are characterized by their proximity to customers as they place themselves strategically, depending on the volume of traffic, so that the customer does not have to look for an information desk anymore. A disadvantage is that compared with a stationary desk more personnel are needed. This deficiency is put into perspective though, if several information desks are needed because of the complex circuitry of a facility.

Information hosts

3.4.3.4 Other Navigation Aids

Signs, buildings' plans and information personnel are the most common components of a guidance system. In addition there is a number of other elements, which also may facilitate the facilitation of the navigation task. These should be considered, however, though, in order not to make the forming of a guidance system too difficult.

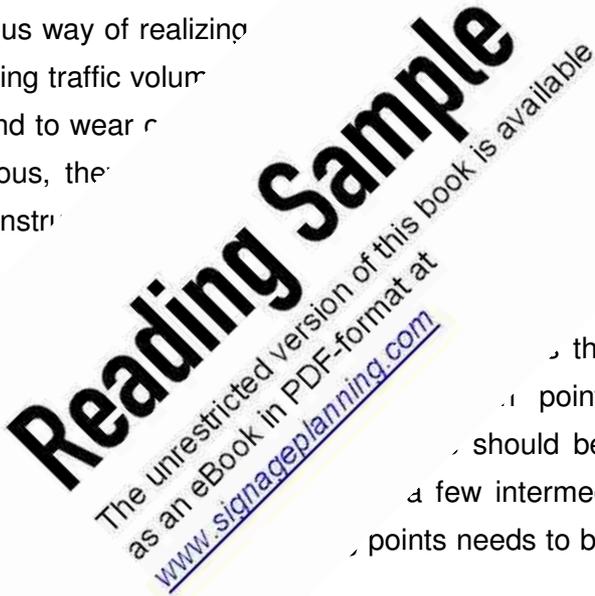
Economical Implementation

Floor, ceiling or wall markings will be the most obvious way of realizing a guidance system with the rising traffic volume. As the users get out and tend to wear a hat, it is advantageous, therefore, to use lowered construction.

s

As soon as the users are in the guiding lines, they should be aware that the users' attention points might be directed to a few intermediate targets. The attention points needs to be made clear.

Examples of limitations of guidelines



Guidelines is flooring distinguished by color. In department stores it is a way of forming corridors between the shelves and racks displaying the goods, thus leading through different sections of the store from one decision point to another. The distinction by color is also frequently applied within road space: bike paths as well as sidewalks for pedestrians are often marked by color.

Contrasting flooring

To understand a spatial representation, as described in chapter 2.3.2 *Perception of Information*, it is necessary to identify distinguishing points. If these are not communicated solely by architectural features, additional designing elements, recognizable from a distance, may facilitate the process of spatial orientation. They support the process of recognizing a location and may be used for path descriptions.

Distinguishing points

Another auxiliary means are the computer-assisted instructions on a screen, which show the best way to get to a destination in color graphic with high resolution. These appliances present the path within a complete map of the building along with the expression coordinates of time and space. Colored blocks mark the respective location point and evolve along the path transcending the different levels to the dynamic depiction comes close to verbalizing the forming of an expectation attitude in the cognitive map. It is obvious that this is incorporated into the logic of the design with regard to content and form. The user interface on screen needs to be designed in a way that the information which were discussed in the previous chapter is presented in a clear and concise manner.

Computer-assisted guidance

3.5

3.5.1

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The design of the components improves its readability. The means of design are chosen so that the elements are combined into a clear and concise syntax as discussed in chapter 3.5.5. The design follows a visual grammar. It determines the relationship of the components to each other as well as the way they function as information carrier. By combining several information units, either a hierarchic or color group information panels are created, also called →signs or →signposts. Within one information unit the terms as depicted in figure 23 are differentiated.

Term definitions

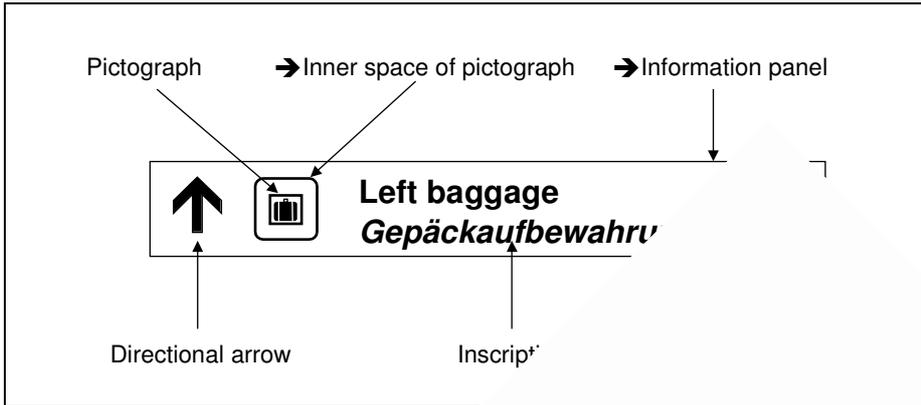


Figure 23: Term definitions

3.5.2 Lettering

An unambiguous, enforced, comprehensive and effective

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... frequently
 ... other design
 ... and quick
 ... determination in
 ... amount of information
 ... ion inevitably leads to an
 ... distinguishable from the
 ... sements.

Necessity of uniform lettering

... recommended to use the lettering as shown
 ... DIN 1451. DIN stands for *Deutsche Industrie*
Norm (German Industry Norm) and represents a common industry
 standard. It is publicly available even as Soft-Font for PC and
 Mac (see www.signageplanning.com). The typeface has been
 agreed upon as standard for traffic signage lettering in Germany, as it
 combines excellent legibility with minimal space requirements.
 Adhering to this standard, the typeface requirements can be
 determined in a verifiable and obliging manner, allowing for uniform
 results regardless of the sign manufacturer. The applications need to
 be carried out in the condensed version as shown, because its 40 %
 shorter tracking allows for shorter signs without compromising
 legibility. In anticipation of the following determination of letter size the
 correct typeface term is: "Schrift DIN 1451-A 40".

Type of lettering

The size of the lettering depends on the distance, from which it will have to be read. The smaller the distance between the onlooker and the signpost, the smaller the size of the letters may be chosen. Due to the definition of a low mounting height range for the mounting and due to the requirement of a strategic location at decision points the actual guidance information must be legible for the recipient. Hence it is recommended for pedestrian traffic that the upper case letter size be 40 mm for a viewing distance of approx. 15 m. An example is given in annex 2.

Size of lettering

The letters should always be in a uniform size, which makes the legibility of the words in a character.

Upper and lower case lettering



As a rule, the same font should be applied consequently throughout the sign. Information displayed might be difficult to read if the letter size is not uniform. The uniformity of the words and lines is another important factor to be followed in order to ensure uniformity, which is also recommended by the manufacturer (see chapter 3.5.5 *Design Patterns*).

Variation of Fonts

Bilingual signs represent an exceptional case (see chapter 3.3.2.2. *Multilingualism*). Different languages on one sign face need to be clearly distinguished without emphasizing a particular one. For a better differentiation and a quicker identification of the relevant language, it is suggested to combine typeface and word order; the foreign-language destination term needs to be italicized and put below the native language term. The logic of order will be discussed in more detail in chapter 3.5.5.2 *Order of Elements*.

Bilingual signs

On bilingual signs the terms in the second language, normally the foreign language, should be italicized and put below the terms in the first language, normally the native language.

3.5.3 Directional Arrows

Arrows represent a directional reference, term with directional information. Just the arrows need to be easily recognizable. A multitude of choice it makes them

Purpose

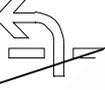
Research on the recognizability leads to the conclusion that simple arrows are easier recognized. The angle should not exceed 90 degrees. The arrow should be combined with an arrowhead. The arrowhead should be clearly visible.

Recognizability

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should be clearly visible. The advantages of a simple arrowhead that combines with an arrowhead, thus looking slimmer. Among other arrow types the arrowhead in figure 24 is particularly

² Arbeitsgemeinschaft Deutscher Verkehrsflughäfen (German Airports Association)

1a.  straight up ahead,	1b.  downwards
2a.  left upwards	2b.  right upwards
3a.  to the left	3b.  to the right
4a.  no appliance	4b.  no appliance
5a.  no appliance	5b.  no appliance
6a.  right downwards	6b.  right downwards

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ents

... in practice is the logically correct ... direction by means of an arrow. The ... apply arrow 1a on wall-mounted signs or elevated signs, whereas arrow 1b tends to be applied on ceiling-hung signs in ... make clear that it is necessary to *pass underneath* it. Individually considered it is probable that in both cases the direction will be interpreted correctly. But when coming to a cross-section with ceiling hung and elevated signs it turns out that uniformity is urgently required. This is why only the pointing up arrow should be applied for the straight-on direction. At the same time this arrow corresponds with the flip-down-rule.

Straight-on directional arrow problem

As a matter of principle straight-on directions have to be indicated by the pointing up arrow.

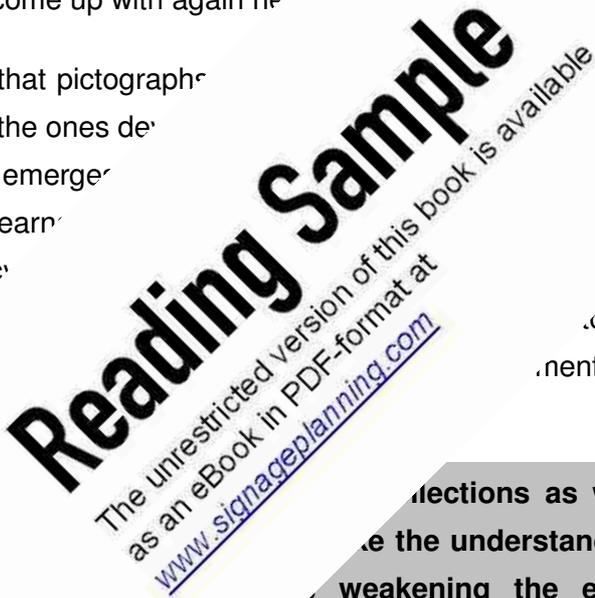
3.5.4 Pictographs

Pictographs play a particular role within signage systems. As a graphic element they seem to elude the bindingness of precise text messages and are thus apt for discussions and corrections. Whereas no one would question a well-established pictograph within a new signage system, to decide whether or not to use one hereof often presents a problem. Consulting graphic experts seems to turn out often to come up with again new

Significance

Assuming that pictographs are used, it is noted that the ones developed are the best, what emerges in any case, the learning of its efficiency is comparatively not

Effect of newly developed pictographic systems



any so that messages pictographs does elements of signage

collections as well as new to the understanding of their weakening the efficiency of

US Department of Transportation (→DOT), for example, dealt with the question whether it should accept the recommendations of the *International Civil Aviation Organization* (→ICAO) as a nationwide standard or whether there should be a new standard developed. The group concerned with the research finally recommended the creation of a consolidated system, which would, as far as possible, resort to over 20 leading symbol systems from all over the world.

Standardization efforts of DOT

On behalf of the DOT and based on these recommendations, the *American Institute of Graphic Arts* (→AIGA) has tried to constitute a standard. Only when no appropriate pictograph was available or if it was not possible to incorporate it into the systematics, a new one was

Development request to the AIGA

designed or an existing one changed. This new system was introduced in 1974 as *Symbol Signs*. These recommendations were updated in 1979 and 1985 and new terms were added. Newer signage systems were also taken into consideration. The new edition of *Symbol Signs* from 1993 can be considered the world's leading pictograph system. The pictograph systems taken into account for its creation are summarized in the following table:

Australian Department of Civil Aviation (ADCA)	Las Vegas Airport
German Airports Association (ADV)	National Park (NPS)
Air Transport Association (ATA)	National Park
British Airports Authority (BAA)	
Dallas-Fort Worth International Airport	
International Association of Airports	Winter Olympics
International Civil Aviation Organization (ICAO)	World Expo ('67)
	Osaka Expo ('70)
	Frankfurt Airport (FA)

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Systems considered within the DOT-Standard

As this researched spadework represents a powerful and worldwide standard, which is continuously updated, it is recommended here to apply the AIGA pictographs. Because of how the project group was formed and because a multitude of international symbol systems were taken into consideration, a high graphic quality is ensured. These advantages outweigh the disadvantages of not being able to consider individual preference or design features, which are an integral part of any standardization process.

Recommendation

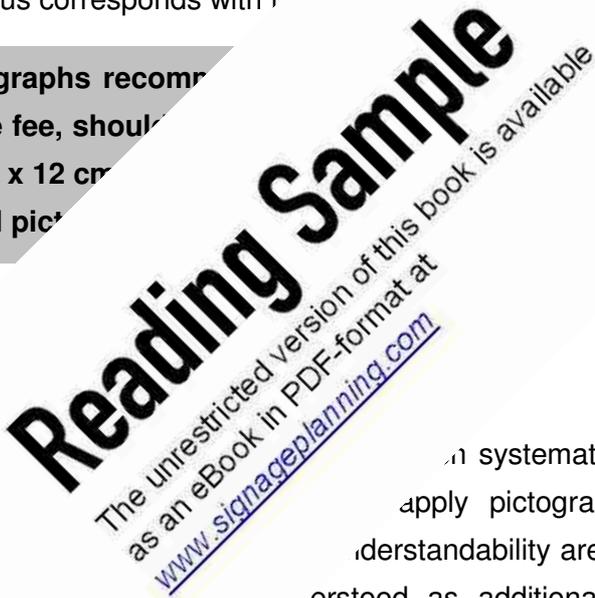
The AIGA pictographs are shown in annex 3 and are available free of license fee. It is not recommended at all to include pictographs other than these or even develop new ones. In cases, for which there are no established pictographs provided, the information is to be communicated verbally only.

AIGA-Pictographs

The size of the pictographs applied shows results from the letter size in connection described in chapter 3.5.5.3. Minimum distance thus corresponds with the

Size of pictographs

The pictographs recommended no license fee, should be size of 12 x 12 cm. Newly developed pictographs



3.5.5

3.5.5

... in systematics has been apply pictographs with no understandability are aimed at. In understood as additional information strong visual streak. At the same time characteristic feature of sign posting, improve its predominant communication of information by both text improves the quality of information - thanks to its affirmative character - and gives the user an additional sense of security.

Appliance of both pictograph and text message

In order to improve contrast and readability the color to be chosen for background should be white (if the pictograph collection does not suggest another one) with black letters, no matter what the actual background color is. The pictographs have to be displayed always within the frame enclosing the actual picture. The frame is the common design element of pictographs, which otherwise differ substantially, thus incorporating the pictographs into a systematics and making them easily identifiable. On yellow signs the frame should

Displaying pictographs

be formed by contrast to the white inner field of the pictograph. The common practice in road and pedestrian traffic to turn or mirror asymmetric pictographs in a way that accentuates the actual directional information is not necessary anymore in the recommended pictographic system, because it is possible to use any symbols with distinctive asymmetries.

Pictographs are always to be applied in the same way. The depiction of the symbol shall be centered in the background of the inner field of the pictograph.

3.5.5.2 Order of Elements

Each information unit shall be written in a language term to direction order and recommended

...ive *Description of "information unit"*
 ... added
 ... reasonable
 ... for a quick
 ...

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...erge into a non-varying ... on the left-hand side and the ... it-hand side. The native term is ... term below in the second line with ... is mode of display results in a more ... sign as a whole than it would be in a ... ent or pictograph placement depending on the ... Both options are shown in figure 25:

Order within one information unit

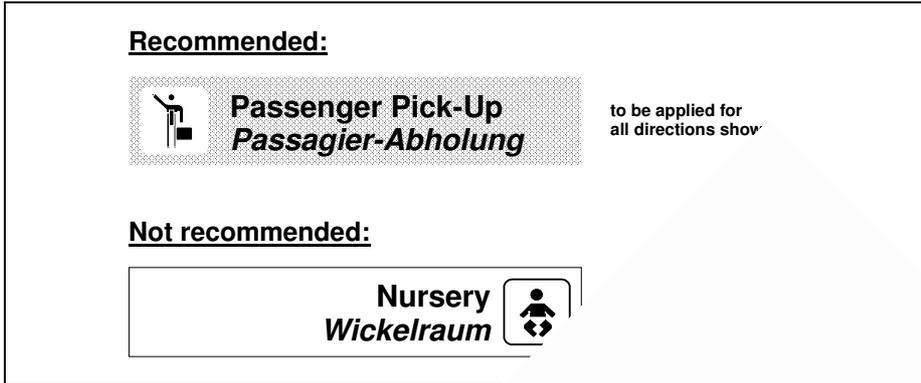


Figure 25: Ordering of information

Another obstacle is the alignment on the left margin and the left alignment of the text on the sign.

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Taking international reading habits into consideration

the left-hand side of the

Arrow position

pointing at, arrows always have to be placed on the left-hand side of the sign. Adhering to the frequent policy of placing the arrow to the right at the right-hand side of the sign is not recommended for two reasons. First, as will be shown in the next section, information needs to be arranged on the signs according to the direction. Given this, one arrow per directional group suffices, which also contributes to the clarity of the sign. A placement of the arrow at the right frame of the sign makes it difficult to assign it to a new directional group, especially when the text message is fairly short, as is clearly shown in figure 26. If this is overlooked, a wrong assignment of information and direction will result. Second, a non-varying arrow placement on one side of the information panel contributes to its smaller size, as it is not necessary to provide space for a second position.

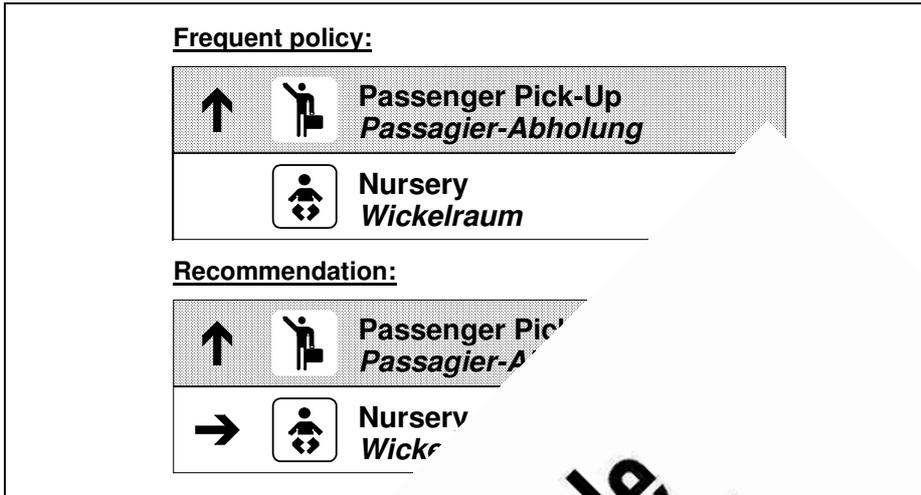


Figure 26: Principles

As a basic principle of the pictograph

Sever
sc

of the

Panel have to be
criteria. In order of

Order between information units

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be placed either above or to the left of the
sign destination type forms either one or several
coherent, compact, i. e. rectangularly defined information panels
or parts thereof as suggested in figure 27.

Sequence of primary and secondary targets

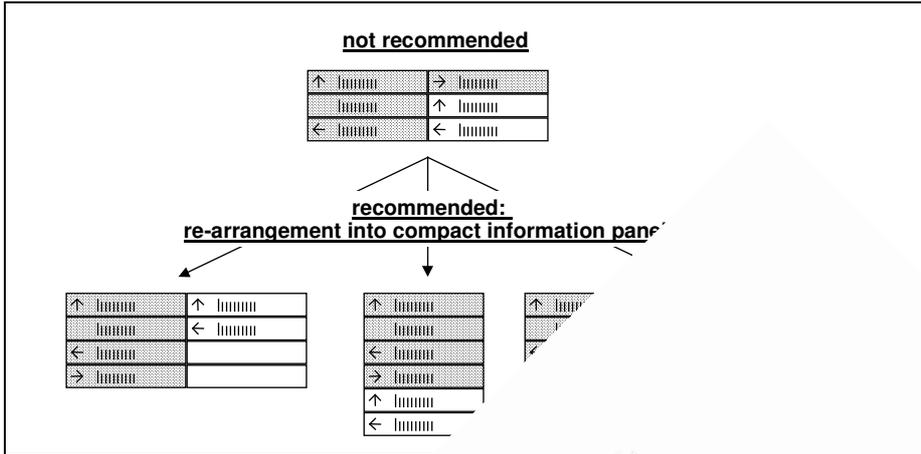


Figure 27: Compiling of

Within each directional group distant targets are positioned above targets that are closer.

top left and right and finally the directional group distant targets are positioned above targets that are closer. Sequence of directions and distances within one directional group distant targets are positioned above targets that are closer.

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any targets are positioned above targets.

level the targets pointing straight on the targets pointing left and finally the targets pointing right.

Within one directional group distant targets are positioned above targets that are closer.

3.5.5.3 Modular System

To make the measurement and fabrication as well as the generation of a transparently structured signage design easier, a modular system with a grid pattern underlies the planning. A modular system with a 8 x 8 grid is particularly suited for application in international (bilingual) signage systems. Two synonymous terms in different

Grid systems

languages are to be outlined in such a way that they are recognized as belonging together even within several top down arranged information units. The inscription equals two modular units, which according to the already determined letter size of 4 units means that the modular unit equals 2 cm. The arrow's length equals two modular units and is positioned in the center of the 8 x 8 grid, which is a quadrat of 16 cm, just like the pictograph modules. If there is a target term with a maximum length of 16 cm, the field of the pictograph has to remain left-assigned one above the other. The text is positioned in the grid lines. The distance between two units from the modular order is 16 cm. This is the recommended design.

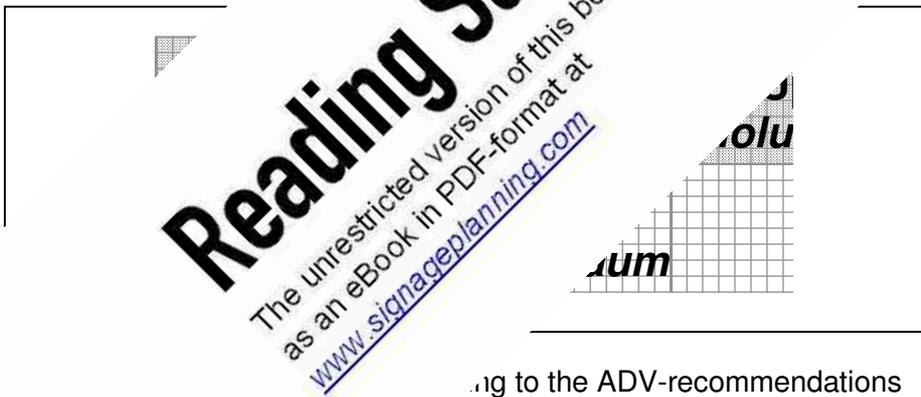


Fig. 3.3.2.1 according to the ADV-recommendations

The height of the sign results from the horizontal addition of units and depends on the length needed for one information unit, which again depends on the length of the inscription. The edge distance has to equal at least one grid unit at all times. Altogether a length of 0,80 m, resulting from the modular order, incorporates all terms listed in the destination directories in chapter 3.3.2.4 *Destination Directory* in the recommended letter style and size (see chapter 3.5.2 *Lettering*) and should thus suffice for all other sign posting cases. For simplifying matters this length is suggested as a standard. The height of the sign results from the number of the information units, which have to be positioned one upon the other to a multiple of 16 cm. Restrictions as regards to the amount of information (see chapter 3.3.3 *Amount of Information*) need to be adhered to.

Sign height and width

A module with an 8 x 8 grid with a grid width of 2 cm is to underlie the design of the sign. A single sign is 16 cm high and 80cm long.

The first module accommodates the direction of the sign, the second one the pictograph. The inscription is placed in the third module on, in lines 3/4 and 6/7.

3.5.6 Destination Signs

Destination signs mark the way to a destination. If they are placed earlier, they look exact like a signpost. Thus the same space can be used for several signs. Destination signs provide information, they are more than just a signpost.

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Destination signs are placed at a certain distance from the destination. The distance is suggested to be 100m for primary destination signs. The height of the sign moves the vision of the onlooker. Figure 29

purpose and Design

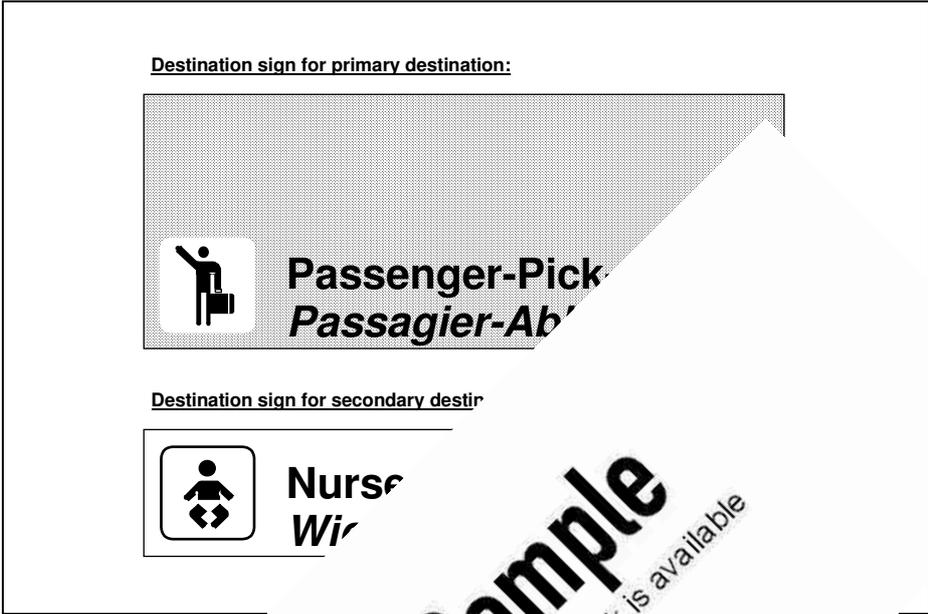


Figure 29: Destination signs

Destination signs should be double size. Free space should be added above

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Figure 30, which identify e. g. *Special case destination identifier* signs, need to be manufactured in a way that avoid inadequate emphasis the letter 'A'. To avoid this, the letter height of the destination identifier should be double the letter height of the destination name. For bilingual information, free space above the destination name should be added. As this is the distinguishing mark of all destination signs for primary targets, no separated blank unit has to be added above the destination name.

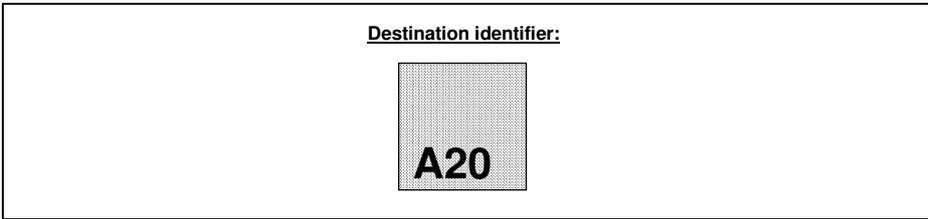


Figure 30: Recommendation for the design of destination identifiers

Alphanumeric destination identifiers are monolingual and thus to be carried out in single-line and in double modular height without an additional module above.

3.5.7 Carrier System

The information units are put together side-by-side by means of a carrier system, through which for the user constitute the sign should be designed in a manner of the information units, which determination. Thus the continuously updated

exchangeability

The information system in needed

carrier exchange if

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4. IMPLEMENTATION EXAMPLE

4.1 Scope

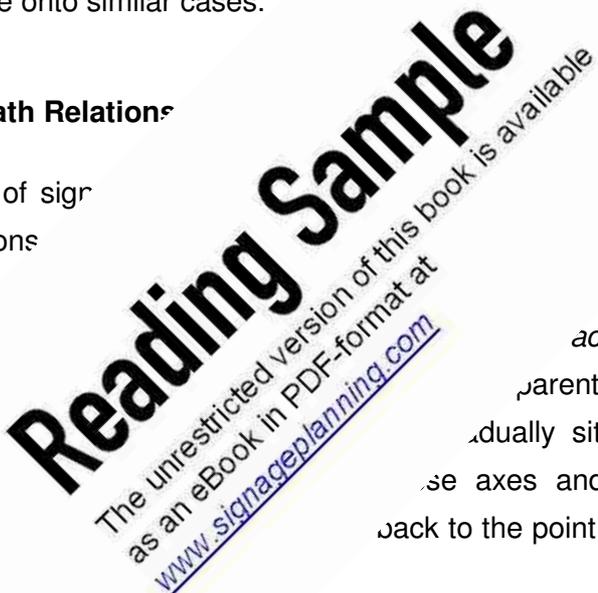
The implementation of the signage recommendation discussed in chapter 3 *Recommendations for Planning* into a practical application is presented in this chapter. The following specifications shall not replace complete planning. It is a systematic, which should underlie the planning of the departure level of a major German airport and is transferable onto similar cases.

Implementation example: German airport

4.2 Path Relations

The basis of signage is the path relations between buildings' and their frame. The main aim is to provide a clear action between the parent depiction of the building and to help the user to gradually situate himself in the space axes and, later, also to return to the point of origin, the

Creation of an axial system



The axial system is built up simply focussing on the main axis. The system is easier to be easily understandable. It is based on the building's symmetries and the layout of entrances and exits as they relate to main destinations. Auxilliary paths and shortcuts need to be disregarded as well as secondary entrances and exits in favor of a basic axial system if the resulting detours are reasonable. These requirements lead to the axial system shown in figure 31:

Design of axial system

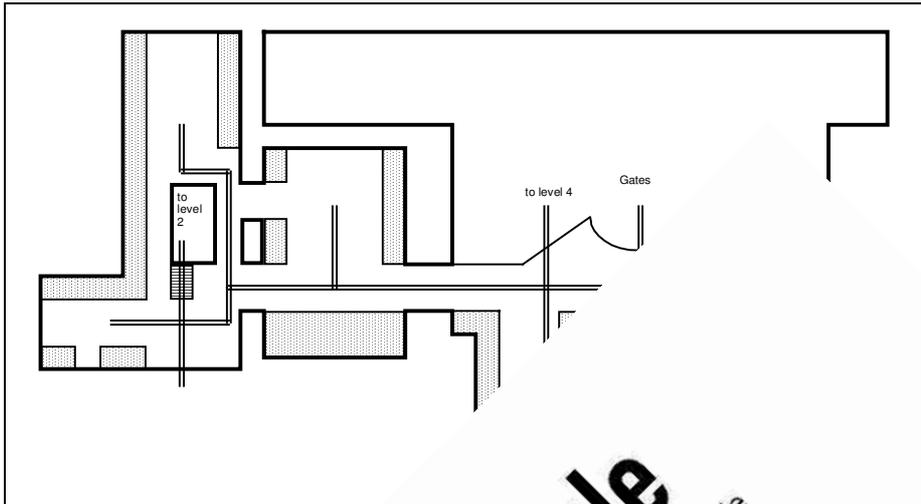


Figure 31: Axial system

4.3 Signposts

These
locations

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Location of the signposts is a basic principle it is used at junctions and intersections, to help users decide which direction to take. In figure 32 these decision

Signposts at decision points

are needed whenever the user might feel uncertain, when the path is long and straight. But it may also be necessary to put up affirmative signposts between two different sections. Doubt might also arise if the destination cannot be properly recognized and it seems that the path ends abruptly. This has led to the determination of location 3, which is marked by a sexangle in figure 32, just like all other locations of affirmative signposts. The locations are consecutively numbered. Lower case letters distinguish the visible surfaces of the signs.

Affirmative signposts

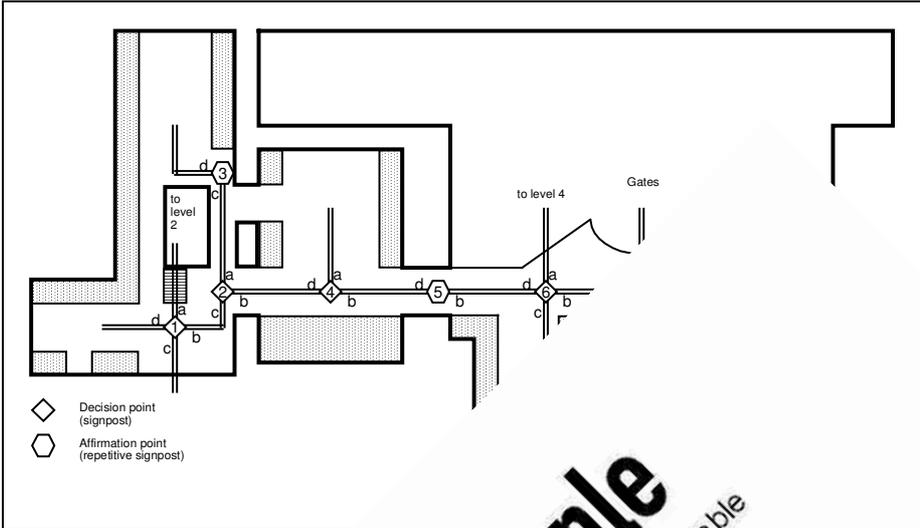


Figure 32: Signpost

4.4 P

The

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...ence in which they *Identification of Terminals and Gates*
 ...3.2.3 Identification of
 ...al 1 and Terminal 3 are
 ...ie order in which they are
 ...mmended building identifiers.

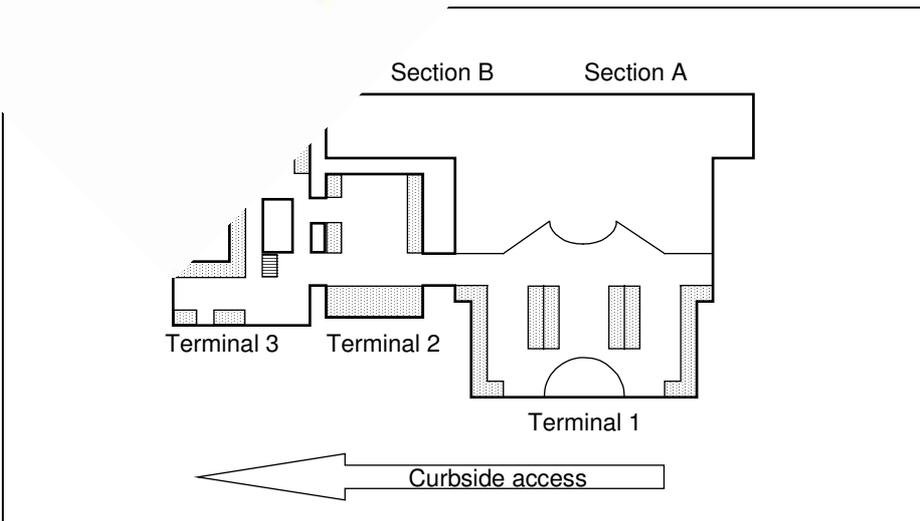


Figure 33: Recommendations for building identifiers

4.5 Sign Contents

The sign contents result from the combination of decision plan and directory of targets in table 2, taking into consideration the constructional and organizational conditions. Two examples for departure and passenger pick-up are shown in figure 4.1.

Determination of destinations

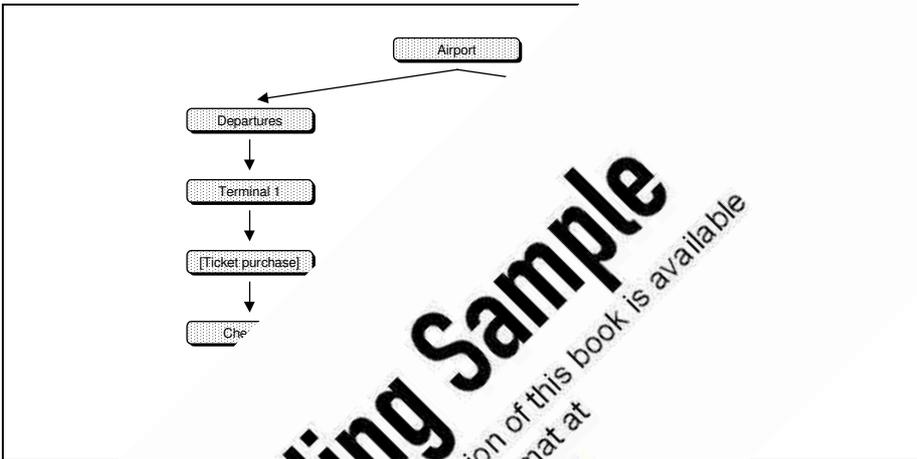


Figure 4.1

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The transition from destinations into a signage draft is completed once the destinations have been configured and the sign contents have been included in the draft. These contents include the sign information, which can be read by the user at the destination locations. The draft in the annex finally includes the destination information of all signs that are to be found at the departure level. Not included in the draft are the destination locations such as e.g. check-in or ticket purchase. Their exact locations in immediate destination proximity can eventually be derived from the on-site situation.

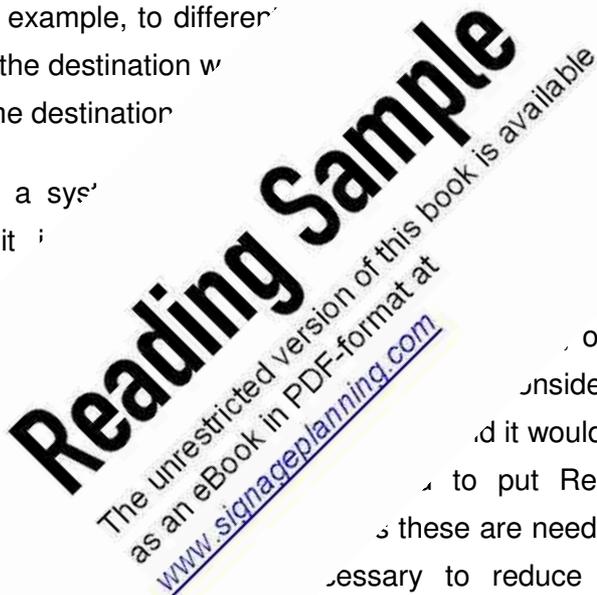
Drawing up the outline

The planning of secondary destination signage results from application of the terms in the listing of secondary destination terms as shown in table 3. It is determined in exactly the same way as the primary destination signs by means of configuration of appropriate destination webs. Other than the primary destination though, these destinations are not frequented according to a predictable order, because they are not incorporated in complex and controlled

Dealing with secondary destinations

sequences. The secondary destinations present independent opportunities, which *may* be taken. As there are no detailed decision plans involved, the configuration of the destination web is based on the allegation to offer as many destinations as possible. Opportunities should be shown with the consistency of the destination web as often as possible. At the same time it is imperative to comply with the capacity as discussed in chapter 3.3.3. The required unambiguity rule, which is often shown, for example, to differentiate between two destinations, means that the destination web should not show two destinations for the same destination.

To ensure a system for destination planning, it is necessary to consider the importance of certain destinations and their order.



The importance of destinations is determined by their location and the set-up of the destination web. For example, a destination that is hard-to-find or hard-to-reach should be given more consideration. In the case of a destination that is hard-to-find, the importance should be high. But the importance should not be too high to put Restrooms and other destinations in the foreground. These are needs that tend to be overlooked. It is necessary to reduce the signage and the amount of information on the signs, to ensure compliance with all concerned parties, and to provide the necessary information in the due course of planning.

Emphasis of single destinations

4.6 Features

The planning aids, discussed in chapter 3.4.3.2 *Maps and Indexes of Buildings*, make it easier to understand the facility's layout and to locate secondary destinations. Figure 35 presents three convenient locations for those aids, which are well visible and have enough space off the main paths. Another central building index is located in the middle of the main Terminal, where the information desk should be located as well.

Location of buildings' listings and users' listings and plans

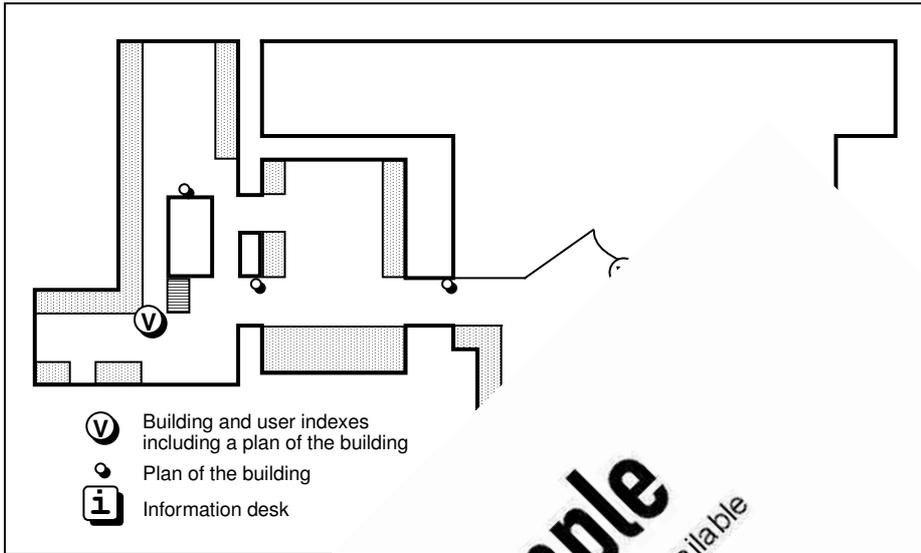


Figure 35: Location of buildings' plans

As buildings' plans are located in corners, the user has to be in a corner situation. This is easiest in buildings' corners. Four locations are shown to lie well within the visibility of

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or confirm a location of buildings' plans. The user has to be in a corner situation. This is easiest in buildings' corners. Four locations are shown to lie well within the visibility of

Location of buildings' plans

5. SUMMARY

Signage systems lead the traffic user within traffic facilities to his destination. Signage systems which are specifically designed to satisfy the needs of the respective users, may accordingly be found in pedestrian traffic facilities. Such pedestrian signage is commonly found at airports, railway stations or other transportation facilities as well as at other than in road traffic for example in shopping centres. They may be found with a varying efficiency even within one facility type or system.

The task of signage systems

The lack of planning and delegation of the task of signage planning, is one of the reasons why signage systems do not work. Consequently, the task of signage planning takes place in a non-democratic manner. This is due to the configuration of the planning team depending on experience, the composition of the team members and the way in which the task may even be anticipated that the team may reach different conclusions after a longer period of time.

Reasons why signage systems do not function

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The involvement of service providers alone will not necessarily improve the quality of signage systems. Usually, as consequence of their creative task, they tend to create totally new signage systems and the formal autonomy of these systems is even more enhanced by incorporating the customers' corporate design.

Integration of advisors

The fact that signage systems should actually satisfy the need for information of users and visitors seems to be disregarded frequently. Effective signage systems should thus be primarily adjusted to the respective users of the offered information. For them criteria such as recognizability or understandability outweigh aspects of graphical or architectural integration of signs into the surroundings. As a matter of fact, effective signage systems require an underlying logical

Revision of objectives

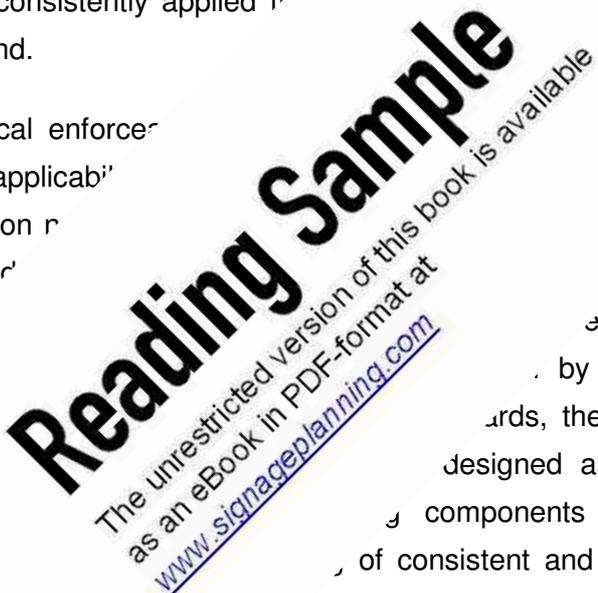
structure and systematics thus helping the user to orient within other spatial representations.

Based on a comprehensive scientific study of the author's aim of the manual at hand to provide the planning of the organizational basics for a standardized signage system to be applied at any location where extensive need to be moved expeditiously and modeled on road traffic signage principles consistently applied to even beyond.

Utility claim of the manual at hand

The practical enforcement of universal applicability with consideration of the demand to deal with facilities, to also stand is to ex pedestrian by international standards, the outcome of designed as a modular components as well as of consistent and user-friendly partial objectives.

Practicability of recommendations



own guidelines and recommendations for systems this modular system is not confined to mere single modules, it also includes instructions on their application. Beginning with recommendations for sign locations, the instructions include rules about limiting the information amount as well as finally giving advice on how to check the logic of the signposting. Ultimately a practical implementation sample of the recommended features exemplifies the interaction between all recommendations.

Implementation of the planning recommendations

The manual at hand does not address merely the planner of signage systems, regardless of his professional background. It also addresses the building owner and facility operator in order to enable him to assess methods and planning steps competently. This special

Target group

knowledge also serves to provide him with the means to moderate conflicts, which are bound to arise during a complex planning process - and decide upon sound standing solutions.

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APPENDICES

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Bundesministerium
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V

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§ 2, für
Anmerkung III 4 der
§§ 39 bis 43 StVO);
aus dem Erich

§;

Facilitation:
of Passenger/Pedestrian
Transportation-Related Facilities;

Entwerfen von Bahnanlagen DS 800/1/V.
und ortsfeste Fahrgastinformationsanlagen
planen und gestalten.;
Mainz

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Empfangsgebäuden
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Annex 1: Lettering

Typeface for traffic signage lettering according to DIN 14701 Part 2

Ä B C D E F G H I J K
Ö P Q R S T Ü V W
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q r s t ü
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Annex 2: Example of letter size

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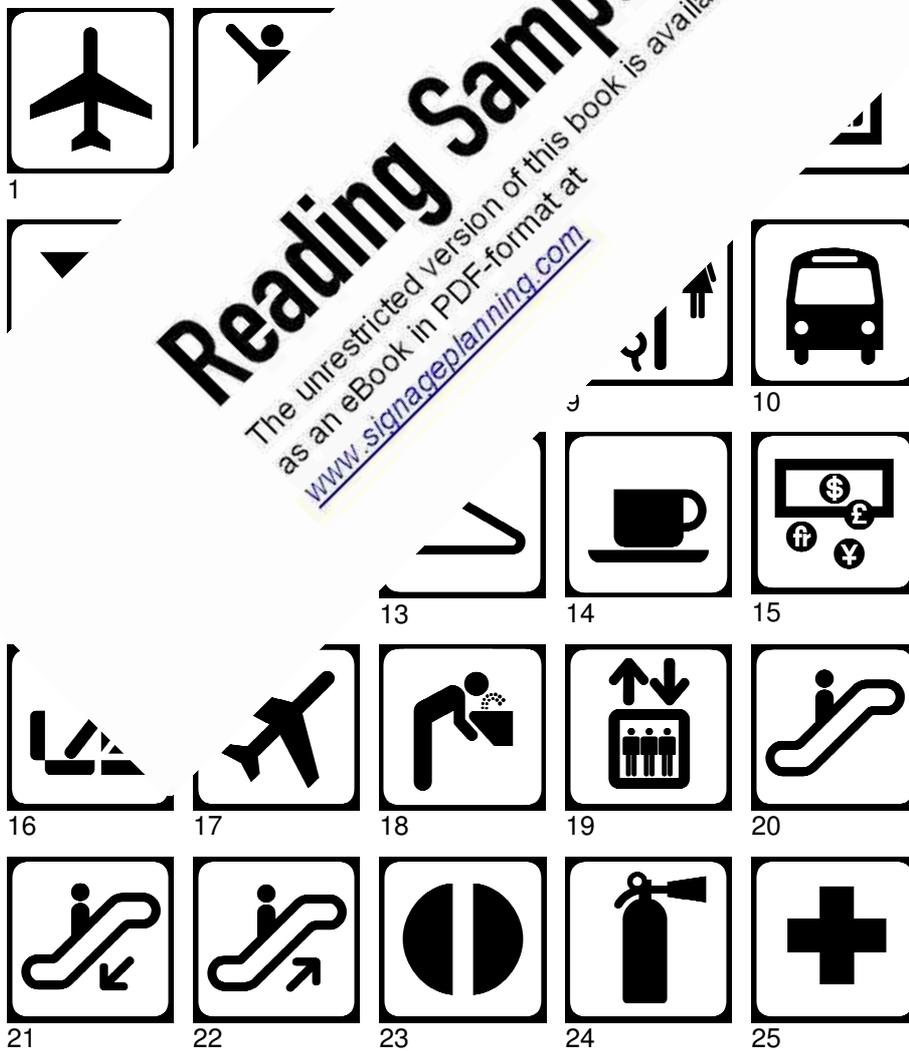
Typeface "DIN 1451-A 40" (condensed, Caps-Hight 40 mm)

Annex 3: Pictographs

The following pictographs are available at

American Institute of Graphic Arts (AIGA)
164 Fifth Avenue
New York, NY 10010

and are also available to download
"Symbol Signs"). The pictograph
the legend which follows below





26



27



28



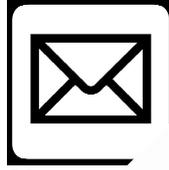
29



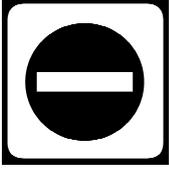
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36



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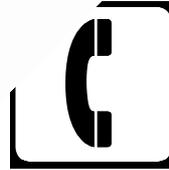


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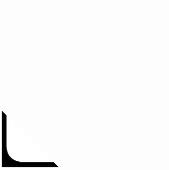
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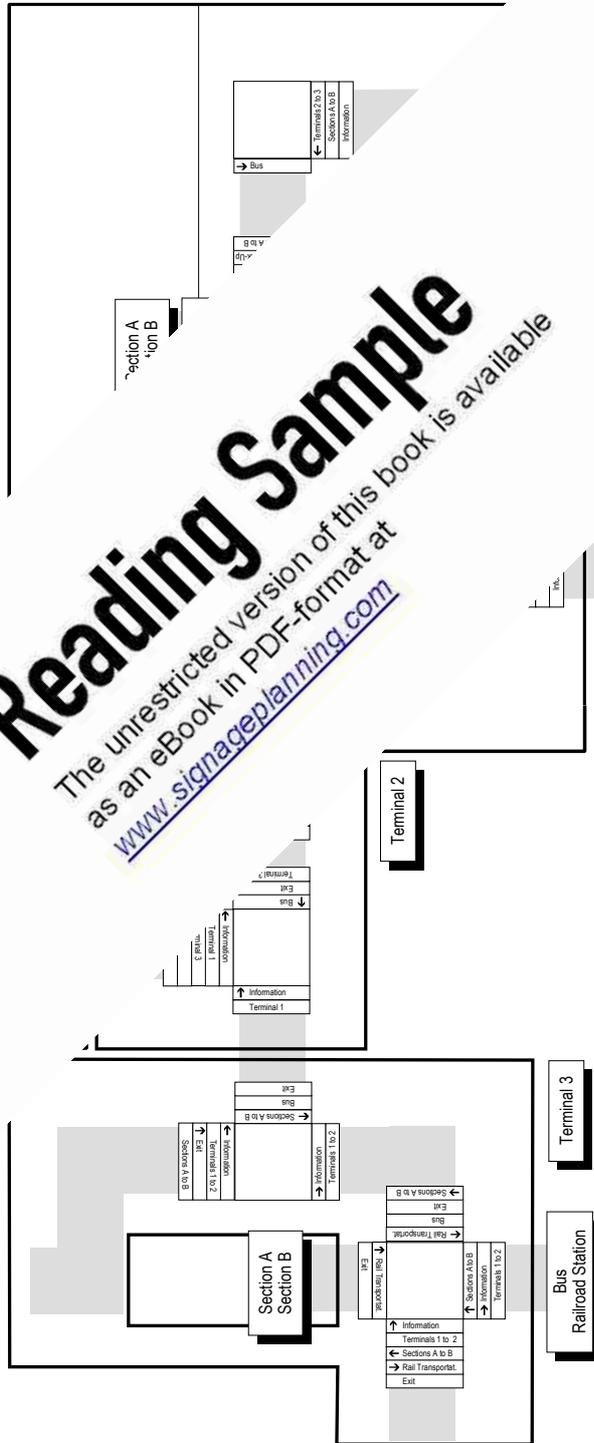
54

Legend

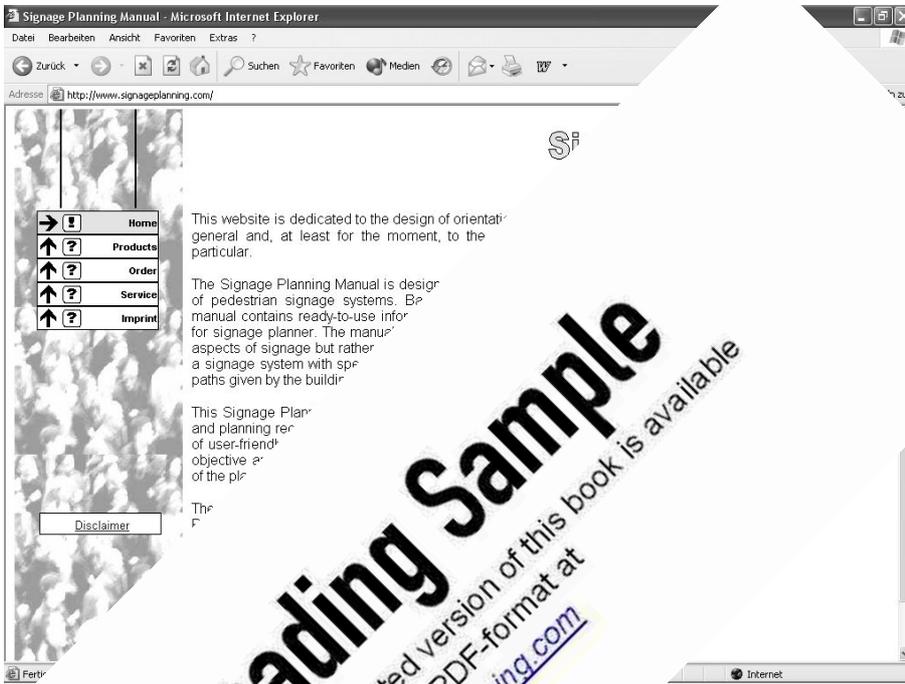
1	Air Transportation	28	Hotel Information
2	Arriving Flights	29	Immigration
3	Baggage Check-In	30	Information
4	Baggage Claim	31	Litter
5	Baggage Lockers	32	Lo
6	Bar	33	
7	Barber Shop	?	
8	Barber Shop/Beauty Salon		
9	Beauty Salon		
10	Bus		
11	Car Rental		
12	Cashier		
13	Coat Check		
14	Coffees		
15	Curr		
16			
17			
			Stairs down
			Stairs up
			Taxi
		49	Telephone
		50	Ticket Purchase
		51	Toilets
		52	Waiting Room
		53	Water Transportation
		54	Womens Toilets

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Annex 4: Signage system draft: Primary targets at the departure level of a major German airport



Please visit this book's website www.signageplanning.com.



about signage system

ck@signageplanning.com



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