Airport Territory as Interface: Mobile Work and Travel in Hybrid Space.

by

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Premise
In order to understand the future potential of work and air travel experience for constant travellers, design approaches from architecture and research methods from social studies should be combined.

Abstract
Global mobility, wireless technology and networked society are transforming the airport territory. These changes (hard factors) have been analysed in airport planning and transportation studies (Koll-Schretzenmayr 2003; Banister 2003; Schaafsma 2003; Knippenberger & Wall 2010; Salewski & Michaelli 2011; Convenz & Thierstein ed. 2014 et al) and architecture and design (Edwards 1998; Blow 2005; Cuadra 2002; Uffeelen 2012; Gensler 2013 et al). But design strategies focusing on the passenger experience (soft factors) have not yet been thoroughly assimilated by architecture and design.

On the theoretical level this dissertation spans the analysis of current methodologies in social studies (e.g. Castells 1996; Gottdiener 2000; Cresswell 2006; Urry, 2007; Elliott & Urry 2010; Adey 2010 et al) and their relation to architectural and urban studies concepts for the airport. The latter includes the “Airport as City” (Güller & Güller 2000), “Aviopolis – A Book about Airports” (Fuller & Harley 2005) and “Aerotropolis” (Kassarda 2010). This dissertation also explores IT and aviation industry interests at the interface between technology and air travellers. In this light aviation industry research and solutions (Amadeus 2011, SITA 2013) are important to consider, as well the philosophy behind who travels and for what purpose (Sloterdijk 1998; Koolhaas 1998; Gottdiener 2000; Urry 2007; Birtchnell & Caletrio 2014 et al). Here, the author’s previous field research at Frankfurt International Airport is relevant.
We live more mobile lifestyles, we work in hybrid spaces (Suozza 2006; Duffy 2010 et al), and we consequently need to share information and collaborate differently. Using constant travellers as a case study, the impact of physical and informational mobility on perceptions of and behavioural patterns in the airport can lead to a deeper understanding of mobile work and the air travel experience. New design strategies can be developed from research about constant travellers, and the results may improve their work and air travel experience. The author’s combination of design approaches from architecture and social science (sociology and psychology) methodologies can better address the real needs of constant travellers in hybrid workspaces. It is hoped that this dissertation will inspire airport architects and designers, interaction designers and the aviation industry to pay more attention to users’ needs in their design processes.

**Keywords:** Airport design, constant travellers, knowledge workers, passenger experience, mobile work, air travel, hybrid space, workplace design, mobile and locative media, geo-locational games, design strategies, holistic approach to design.
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Airport Territory as Interface: Mobile Work and Travel in Hybrid Space

Introduction

Premise

In order to understand the future potential of work and air travel experience for constant travellers, design approaches from architecture and research methods from social studies should be combined.

Purpose

The following PhD research argues that airport architects and designers will be required to share analyses from social studies and architecture in the future. In order to understand work and air travel in hybrid space, they will need to develop new airport design approaches that focus on constant travellers. A deeper understanding of these circumstances is crucial in order to improve the passenger airport experience of these workers, their work satisfaction and their global knowledge.

The main aim of this report is to compare literature from the past and apply it to the present. How the concepts of networked office and mobile work tie into the context of air travel? How a study of constant travellers might help to improve work and air travel conditions? Finally it offers recommendations for the new airport experience in the future.

Background to the research

Today, the remarkable growth in application of information and communication technologies (ICT) indicates a shift towards a globally integrated network society. The Spanish-Canadian sociologist Manuel Castells explains that a networked society reproduces an uneven flow of capital, information technologies, goods, and people (Castells, 1996). These flows shape new social spaces with characteristics and dynamics that are both material and immaterial. Castells calls these new formations a “space of flow”. Key indicators of the “space of flow” are transportation nodes such as airports, railway stations and automated ports or terminals inhabited by members of mobile societies who are constantly “on the move”, “co-present”, and equipped with mobile devices (Urry, 2007). These nodes regulate and control the flow of people and goods in a global economy, and they become meaningful regional development poles within centres of high-traffic activity, emerging frictionless mobility corridors, and economic zones of global competitiveness.
My historical analysis attempts to reveal, how the technological innovation of flying disrupted existing movement patterns by introducing another radically different mode of transportation. This triggered changes in society, the emergence of a global economy, and hence the gradual commercialisations of the air travel experience. Airports turned into territories of regional employment and prepared the ground for mobile work and the phenomenon of constant travellers. Understanding airport designs from the past shows how a design that emphasizes the needs of passengers and improves airport hospitality, rather than focusing primarily on the form and function of the airport, enhances the airport experience of the ordinary as well as the constant traveller.

Further research has shown that constant travellers stretch the capabilities of mono-functional zones in airport terminals because of their mobile work style (e.g. converting restaurants, gates, planes into hybrid workplaces). “Smart” airports should foster social interactions and passenger engagement rather than reduce the passenger experience to the use of a variety of technological interfaces for ease of congestion at airport thresholds. Instead, emphasis tends to be put on increasing revenues from non-aviation related activities, or creating the illusion of a “local place”. Alternative ways to spend time in the airport leave choice to passengers and create potential for more human-to-human interactions. And a more balanced human-natural and human-computer interface might address passengers’ needs for more physical comfort and mental satisfaction.

Furthermore, in the last few decades, international airports have begun to play an important role in urban developments, accommodating the activities of both local workforces and global transnational elites. Here, the emerging socio-spatial transformations of the network society can be well observed. The nomadic lifestyle typical of this society is increasingly connected to plane trips and inter- or transnational activities (Codourey in Bittner, 2007). In his conceptual study for the offshore relocation of Schiphol Airport (1998), Dutch architect Rem Koolhaas envisioned a new city built on an artificial island in the North Sea. This gigantic airport would incorporate entertainment and business centres as well as housing for “kinetic elites”1 – a growing international population who travel hundreds of thousands of miles every year, and who do not need a home but rather a comfortable and convenient place to recover between flights (Urry, 2007). Today, nomadic lifestyle is no longer solely enjoyed by the kinetic elites. Indeed, many thousands of business people and professionals would not call this nomadic lifestyle a privilege at all.

The focus of this dissertation is on group of air passengers who do not belong to the kinetic elite but who are nevertheless, constantly on the move for work purposes (e.g. business people, professionals, artists, academics, media workers). Their work activities are spread geographically between countries and cities. The frequency, distance and intensity of their travels are not as relevant as the fact that the

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1 Rem Koolhaas borrowed the term “kinetic elites” from German philosopher Peter Sloterdijk.
space between destinations has become for them: a continuum. I have called this group “constant travellers”. For these travellers, the time they spend in transit is part of their work-style, and the airport is an interface\(^2\) with a hybrid space\(^3\) enabling both global travel and work. The workplace, concomitantly, has become increasingly mobile, shifting between office, home, park bench, taxi or airport. In other words, there are no barriers between "work space", "transit space" or it seems, any other space for constant travellers. For constant travellers, work is mobile, they work in transit and they travel for work. But how did this airport-as-interface evolve the constant shifts between work and travel, private and public or virtual and physical? Many architects and academics (Hillier, 1984; Pascoe, 2001; Diller & Scoffidio, 2002; Mitchell, 2003; Mc Cullough, 2004; Fuller, 2008; Picon, 2010) have discussed the idea of architecture as interface between physical, digital or social spaces. The focus of this dissertation is on airport-as-interface to distributed work (and how it is experienced by those distributed workers). Therefore, I will be refining my focus to following three aspects of the airport interface: human-space, human-computer and human-human. The main design question, I will be addressing is, how can the airport interface enable work as well as endow constant travellers with greater efficiency and, physical and emotional comfort?

Previous research on constant travellers has demonstrated that business and professional knowledge workers continuously intensify their work-related activities on a global scale. Mobile work and air-travel is a necessity for successful careers in globally competitive work. Constant travellers are part of an emergent knowledge workers rather than elites. They need to be efficient in multiple space-time zones, share and develop ideas in hybrid space, be on the move in many locations including their home-office, client sites and airports. For them the airport is essentially a workplace – part of a spatially distributed and networked office.

As an architect, I study practice-based methodologies around work and travel, feelings, patterns and behaviours in order to design and implement better solutions for constant travellers. My central argument is that design of the airport interface, as a mobile workplace requires holistic approaches that focus on understanding constant travellers’ needs and involving them in the design process.

**Aims**

This research will gather recommendations that may improve the experiences of constant travellers in the hybrid workplace, by combining a critical inquiry into airport architecture with the study of how

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\(^2\) "Interfaces define our perception of the space we inhabit, as well as the type of interaction with other people with whom we might connect. Interfaces are defined as communication mediators, representing information between two parts, making them meaningful to one another (Johnson, 1997; Lévy, 1993; Suoza de Silva, 2006)."

\(^3\) "Hybrid spaces are mobile spaces, created by the constant movement of users who carry portable devices continuously connected to the Internet, and to other users [...] The connection is related both to social interactions, as well as to connections to the information space, that is, the Internet" (Suoza de Silva, 2006)."
technology changes the experience and behavioural reactions of the air travellers. The initial goal is to explore urban and architectural design challenges by studying how airport architecture evolved over time to accommodate the growth of global mobility and advances in technology. Thirdly, the research investigates how concepts of networked offices and mobile work tie into the context of air travel and fourth, to survey travellers’ behaviour in the airport by focusing on this specific group of constant travellers: describing their profile, analysing their decision making patterns and formulating new designs based on a procedural map for work and air travel.

Methods and Methodologies

My research methodology involved carrying out a literature survey that covers a broad range of academic discourses, associated methods and projects relating to airports, mobility and future workplaces. This review considers texts from the following disciplines: architecture, sociology, surveillance studies, mobility studies, urban computing, interaction design, and workplace design. The survey is supported by field research, observations and project examples from architecture and design. The empirical part of the study focuses on the study of constant travellers from a trans-disciplinary perspective: architecture, human-computer interaction, sociology, and cognitive psychology. The case study investigates the impact of physical and informational mobility on perceptions and behavioural patterns of constant travellers who work in hybrid spaces.

My research project developed in five successive stages:

- My initial research was titled “Living-in-Motion”. I interviewed people who worked and lived in different locations, and combined the results into a series of CD compilations about “Homo Ludens”. This required historical research into “New Babylon”, the vision of Dutch artist Constant Nieuwenhuis, and other visionary works of the British architects group Archigram who focused on the interactions between technology, society and the built environment. “Living-in-Motion” was exhibited at Zurich Design Museum in a show called “Be Creative! Der kreative Imperativ” curated by Marion von Osten and Peter Spillman in 2003. Thus began my interest in mobility studies and architecture.
- Before my PhD research, I conducted field research, visual ethnography, interviews and a literature survey about border conditions at Frankfurt International Airport as part of a Bauhaus Dessau research project in 2004-2005. This resulted in a set of maps showing socio-spatial mobilities at the airport and a video essay on “Airport Transit Conditions”.
- My experiences in the above projects placed me out of my comfort zone of architecture and I realised I needed to know more. Therefore, I embarked upon new literature surveys, observations and reviews of selected projects.
• After completing the above research, I then embarked on the practice-based side of my research, which consisted of multiple studies of a selected group of constant travellers.

• These multiple studies gave me structured insights about the needs of constant travellers, which has resulted in the formulation of a series of recommendations for the development of new design strategies for the hybrid space of work and air travel.

The following diagram is a map of the methods and methodologies involved in this dissertation:

![Diagram: Methods and Methodologies involved in this dissertation, Codourey (2014)](image)

**Outline of Chapters**

This dissertation is divided into two parts: (1) theoretical considerations and design potentials. Here the first three chapters explore and outline relevant theoretical concepts formed in multiple disciplines in order to fully draw upon sources and arguments outside my discipline of architecture.

First, I needed a deeper understanding about the transformation of airport architecture from an historical perspective and how the term “Airport Territory” came about. The literature survey includes theories about the relationship between evolution and function in architecture and urban studies, combined with insights from mobility studies and sociology. I explore how architects, designers and planners have reacted to evolving functions and passengers’ needs, business travellers in particular.

Second, I investigate the ways airport owners, architects and designers respond to the complex logistic and security problem of passenger flow. Here, I also explore how design strategies are applied to passenger experiences of the airport. I focus on understanding how these strategies shape passengers’ perceptions and various levels of interaction. Therefore, I review many examples of design approaches from architecture, interior design, product design and advertising and mobile technology. Furthermore, I support my findings with background research and interpretations from surveillance studies, urban computing, mobility studies and architecture, and look at the airport as an interface.
Thirdly, to make a connection with work-related air travel I review various concepts of hypermobility caused by globalisation and mobile technologies. I extend this discourse with interviews conducted with people living in motion prior to my dissertation, which led me to the formulation of my thesis focus on constant travellers (case study 1). Finally, I complement my background research by studying how architects and interior designers reflect upon mobile work in the context of the network office. This background explains how working in hybrid space changes the way we work and think about our workplace. Case study 2 is an example examining why user-participation is crucial for the design of the hybrid workplace in any context.

(2) The second part of the thesis outlines my own practical research and response to the theoretical discussions of the first part. This will involve extensive analysis, applying social science methods to the specialized group of air travellers that I have identified as constant travellers. The investigation consists of multiple studies consisting of qualitative interviews and quantitative surveys. These studies inform design about the future potential of work and air travel for constant travellers. Next, the set of design studies and artistic interventions explore ways to improve the experience of the airport as a hybrid workplace for constant travellers. They help to formulate design strategies for airport interfaces (human-human, human-computer, human-nature) and a set of recommendations for architects and designers.
Fig. 2. Mind Map of the Dissertation, Codourey (2014)
Part I - Theoretical Considerations

Chapter 1 - From Airport Terminal to Airport Territory

In this chapter I explore the functional evolution of airport terminals and the airport territory as part of a global network in order to pursue the following questions:

• How have advances in air transportation shaped the airport as a workplace?
• How has airport architecture responded in form and function to the impact of global mobility?
• How do designers and architects deal with these changes?
• How has “Airport Territory” evolved? This historical question entails exploring the growth of the airport from a single architectural building into an "Aerotropolis" (Kasarda, 2011).
• What is the relationship between the growing demand for global mobility and airport development from an architecture and design research perspective? Here I will explore theories about the relationship between form and function in airport design, as well as connections between novelty and the airport as a workplace for constant travellers (Pascoe, 2001; Güller & Güller, 2003; Pearman, 2004; Fuller & Harley, 2005; Cresswell, 2006; Urry, 2007; Gordon, 2008; Adey, 2010; Kasarda, 2011; et al)

In this chapter I will study how technological progress and the expansion of global mobility has formed the airport workplace. Analysing relevant discourses from mobility studies, I will examine how architects and designers have responded to the changing needs of air travel.

Chapter 2 - Interface in Airport Flow. How Are Airports Designed for Passenger Experience?

This chapter asserts that the solutions proposed from design, art, service and entertainment fail to adequately address different travel purposes and target groups. Chapter 2 therefore, investigates how airports accommodate the flow of passengers and their needs in order to pursue the following questions:

• What measures have airports taken to improve the overall journey experience?
• What effect do transformations in technology have in this respect?
• How do designers and architects deal with the issue of passenger stress?
• How does the design of airport flow influence the passenger experience?
• How has airport design and technology developed for passenger surveillance, and what impact does this have on the hybrid space of the airport?
• How are passenger emotions manipulated by different design strategies?

There have been many interpretations of the meaning of airport space in relation to the passenger experience – e.g. public space (Augé, 1995; Rosler, 1998; Göttdiener, 2000; Pascoe, 2001;
Fuller & Harley, 2005; Cresswell, 2006; Salter, 2008; Bissell, 2008; Adey, 2010; Bissell & Fuller, 2010; Dodge & Kitchin, 2011) – the present analysis will focus on the design of the airport experience for passengers who travel for work. As far as I am aware no researchers have explicitly focused on the issue of designing solutions for the growing number of constant travellers.

Chapter 3 - Mobile Work in Hybrid Space

This chapter will assert that we now live in mobile society, where we are constantly on the move and globally connected via mobile devices. I will query in what way our lifestyles have changed due to developments in technology and growing global mobility? Relevant aspects of mobility studies will be connected with current mobile workplace trends and my own praxis to explain how workplace design reflects changes in the way we share information and collaborate.

Chapter 3 will first look at how urban and global nomadism has been discussed across many registers (e.g. mobility studies, corporate, popular culture) in connection with mobile technology and the global economy (Sloterdijk, 1988; Makimoto & Mannres, 1997; Rossler, 1999; Gottdiener, 2000; Bauman, 2005; Cresswell, 2006; Nowicka, 2006; Urry, 2007; Kluth, 2008; Turkle, 2008 et al). My interviews with “homo ludens” and research into “living-in-motion” will be presented and discussed as case study 1. Case study 2 (from my practice as workplace consultant and designer) will show how the shift from manufacturing economies to mobile knowledge economies has altered work and consequently workplace design (Gartner & MIT, 2001; Duffy, 2008; Bittenor, 2008; Kluth, 2008; Foertsch, 2013; Lister & Marsh, 2014 et al). Here I will discuss the importance of user participation in the design process for the mobile workplace.

PART II – Design Potentials: Artistic Research

Chapter 4 - Work and Air Travel Experience of Constant Travellers

This chapter will demonstrate why it is important to study the emerging type of air passengers that I have identified as constant travellers. What methods should be applied to understanding their needs? How does air travel and mobile work in hybrid space impact their airport experience? Can multiple studies of constant travellers lead to deeper understanding of mobile work and air travel?

After proposing a typology of air travellers (in connection with my earlier field research at Frankfurt International Airport), I will define the constant traveller in the context of classifications of mobility forms (Urry, 2007) and various descriptions of business travellers (Sloterdijk, 1997; Koolhaas, 1998; Gottdiener, 2001; Davidson & Cope, 2003 et al). Finally I will present multiple studies on constant travellers and discuss their procedures, results and analyses.
Chapter 5 - Design Strategies to Improve the Work and Airport Experience of Constant Travellers

In this chapter I will test how research results derived from qualitative and quantitative methodologies can be combined with design strategies in order to improve the airport experience for constant travellers. What design strategies and artistic interventions can be developed from iterative projects about constant travellers? How can these designs improve the efficiency, emotional status and health of constant travellers?

Here I will consider four stages of iterative design strategy informed by insights into emotions, health and work efficiency – i.e. the actual needs of constant travellers. These design strategies will be contextualized with relevant project examples (dopplr.com, airline and airport apps, artistic projects by Blast Theory). Context-aware, mobile and social applications in the airport and strategies for improving emotional design will be discussed through a series of case studies. These case studies will include: “Paxman 2.0”, “Guide to Smart Air Travel”, the “Local/Connect-Think Delay” and “Hybrid Workspace”) Finally, I will argue that the airport is, among many other things, a workplace, and a holistic approach to the design of airport architecture, including both its physical and virtual layers can help to improve work and air travel experiences.

Chapter 6 – Conclusion

In the conclusion I will present a set of recommendations derived from the research and arguments presented by combining my findings on architectural design approaches and influences from social studies. I suggest that future airport design might take a holistic approach and focus on the following potentials:

- Improve conditions and efficiency of work and air travel
- Help to maintaining a balance between the negative impact of air travel and good health
- Offer multi-use spaces that support the physical needs and health of constant travellers
- Create opportunities for social interaction, engagement in the community and places for reflection.

Consultation with constant travellers should inform the design of potential airport workspaces.

Constructing teams consisting of an architect, a workplace consultant, an interaction designer, airport managers and constant travellers will facilitate the genesis of a hybrid workspace that addresses the diverse needs and situations of focused work, meeting, collaboration and the exchange of ideas.

New business models for shared workspaces may emerge through the cooperation of global organizations (e.g. corporations with many constant travellers, café chains) and co-workers from
creative industries (e.g. media artists, interaction designers and architects) in the development of financial and operating synergies (e.g. Camel Lounge, boutique shops). Together with constant travellers, they should be invited to develop alternative uses for hybrid airport space that further elevate the experience of air travel and launch the airport as an innovative future urban form.

Such trajectories might not only increase the future potential of work and air travel experience for constant travellers but, require architects to collaborate with social scientists in the future.
Airport Territory as Interface
Chapter 1
From Airport Terminal to Airport Territory

Airport Architecture has been transformed by many influences of global mobility, but these changes have not yet been adequately studied in the fields of architecture and design. In this introduction I will show from an historical perspective how the term "Airport Territory" came about, and how it evolved, by exploring airport transformation from its beginnings in airfields and simple sheds into the concept of the "Aerotropolis" (Kasarda, 2011). The growing demand for global mobility has had a paramount impact on airport architecture and urban contexts, and it is important, therefore, to understand these developments from the architecture and design research perspectives. Although there have been many theories about the relationship between evolution and function in airport design, and many connections made between airborne mobility and the public (Pascoe, 2001; Güller & Güller, 2003; Pearman, 2004; Fuller & Harley, 2004; Cresswell, 2006; Urry, 2007; Gordon, 2008; Adey, 2010; Kasarda, 2011, et al), no comprehensive analysis of the interface between human mastery of the air and its impact on society in the many dimensions of mobility, novelty, work, or military power has yet been presented. The aim of this research is to understand the future potentials of mobile work and air travel for constant travellers by exploring technological, social and architectural advancements in the airport to accommodate the global expansion of air travel.

In this chapter I will offer a historical analysis connecting form and function in a public workspace with the potentials of mobility that have evolved since the beginning of airport design – or, in other words, how advances in mobility and technology have shaped the airport as a workplace for those who travel through it. How, then, have architects, designers and planners reacted to the evolving functions and requirements of air travel?

1.1 Functional Evolution of Airport Terminals

The early 20th century was marked by many novelties, but among the most sensational of these was the flying machine. It seems that the ancient desire of humans to master flight, which had until then been the domain only of birds. The following 100 years saw these technological achievements cause an explosion of mobility, and of the environments it created, networking the entire planet. By tracing the evolution of form and function in airports in connection with the overarching concepts of mobility and work, I hope to shed light on the indispensable need for users to be part of future design.
In this section, I provide a brief historical overview of airport according to Pascoe, Pearman, Gordon, Cuadra, Fuller & Harley and Adey. I am using the periodization of aviation that is, according to Gordon a way to trace the functional evolution and the architectural form of the airport terminal.

**Air Mobility as Novelty and Spectacle (1903-1918)**

1903 to 1914 was a decade of pioneering practical developments in both aeroplanes and airships. The first airport ever built was at Huffman Prairie Field, used by the Wright brothers in 1904-05 for their early experiments in flying, and equipped with a basic hangar—a simple temporary shelter for planes. This field was located along interurban rail lines from the brothers’ hometown of Dayton, Ohio, which provided them with easy access to their home. With the permission of the field’s owner and banker Torrence Huffman, they began (like other inventors in the U.S. and Europe) using this field to train themselves as pilots and to develop dependable, fully controllable airplanes.

![Image has been removed due to Copyright restrictions](image-url)

*Fig. 3. The first airport. Dayton’s “Wright Field” 1904-1905, Ohio, USA (Source: Cuadra, 2002:22)*

By 1908 Wilbur Wright had given a demonstration of his flying machine in Paris, and the following year Luis Bleriot performed the first international flight on his monoplane across the English Channel, a distance of some 50km. In the early stages of aviation, distance was the most important variable towards measuring mobility benchmark of success. Furthermore, these new flying machines became an object of admiration for the general public, and airfields became places where people gathered to watch the “air show”. According to British human geographer Peter Adey:

> Efforts to encourage people to become aerial were initiated in Britain by the Air League of the British Empire (...) They did this by inviting them to flying meets and races, and encouraging the Scout Association’s publications to feature articles on famous airmen and their exploits. (Adey, 2010:28)
The public was drawn from the city to physically experience the new and constantly changing situations, the technological achievements and the pilots’ skills. With awe they witnessed speed trials, distance falls and height trials. Soon event planners had to accommodate up to 500,000 spectators and organise ground fairs with extended functions such as shops, restaurant, barbers, beauty parlours, post and telegraph offices, and even circuses. (Pascoe, 2001:50; Pearman, 2004:8) The know-how in gathering and entertaining large numbers of people was based on experience from organising other events that had been popular since the mid 19th century, like circuses, race tracks, fairgrounds, and industrial fairs or exhibitions. Pascoe wrote:

The attraction for the visitor to Port-Aviation was simple: the aerodrome - the flat space on which planes arrived and departed - had became the new, modern threshold between one element and another, whose very design was, as it were, unlimited; it could define itself only spatially, only in terms of aircraft entering and leaving the frontier of airspace. Luis Blériot having crossed the channel, there were no more state boundaries. (Pascoe, 2001:46)

And the architecture that grew up around these new aviation shows at the aerodrome, began to feature not only hangars for sheltering and maintaining the aircraft and facilities for powering the planes and preparing the ground for take-off and landing, but also nodes for public transportation and access – frequently including, a railway station. (Pascoe, 2001:46) Air mobility was initially imagined as a novelty and event but then later re-imagined as military, freight and mass transit concepts.

The work was limited to managing large crowds of people, as well as building and servicing the infrastructure for the events – a development that was interrupted by World War I (1914-18), when
many airfields with hangars were built purely for military purposes. However, by 1918 the Wright Company was operating a flying school and a US airmail service. Meanwhile in Germany the world’s first airline company (Deutsche Luftschiffahrts- Aktiengesellschaft) had been operating Zeppelin airships since 1910. Such user potentials caused a chain of modern airfields to be developed with related jobs. Slowly, these jobs started to take shape and influence the quality of the airport as a workspace. But it was the novelty of flying that inspired the most visionary architects and planners, particularly the modernists and Futurists. They were excited by futuristic solutions and focused on how air mobility might influence the life of society – especially its upper echelons – and the character of cities. They believed the airport would be the key to the “city of the future”.

Right from the start air mobility was a novelty and large crowds of people came to admire the technological development of flying machines\(^4\). This theatrical response stimulated pioneer roles for professionals: inventors and engineers, aviation pioneers and new business development entrepreneurs, as well as specialists for managing public events and crowds. From the architectural perspective the hangar became a major design structure, and architects began looking into other models from 19th century event architecture, like exhibitions, fairs and circuses, in order to accommodate the event service functions of air shows. The excitement of airborne travel led to futuristic projects by architects who wished to explore how air mobility could influence public life and the city.

\(^4\) By this time, the second Industrial Revolution had transformed all facets of the economy in Europe and North America. The development of sophisticated industrial methods for steel and iron production allowed faster and cheaper production of new materials for building bridges, railroads (previously made of iron), large ships and even skyscrapers (iron frames were permitted into constructions by 1860, elevators assisted climbing by 1870). Railroads also benefitted from the price decrease of coal (increased demand) for steam locomotives. In consequence, the railroad became the dominant form of transport infrastructure with a steady decrease in the cost of shipping materials and products.
The Birth of the Airport (1919-1930)

However, it was the international expansion of air travel in the 1920s that led to the conversion of bombers into airliners and military airfields into civilian aerodromes\(^5\). The first international service in Europe began in 1919, when European Aircraft and Transport Ltd. began to fly a regular schedule between London and Paris. Its planes carried up to 26 passengers, and airports started to process these passengers in a routine fashion. This commercialization of the aviation industry created new workplaces, not only for professional pilots, but also for the staff needed to provide for passengers, service aircraft, and predict the weather. By 1928, Germany had 160 airlines flying more than 64,000 km daily and carrying nearly 20,000 passengers a month (Pearman, 2004).

The earliest international airports were developed on former military airfields in London (Croydon Aerodrome 1920), Paris (Le Bourget) and Berlin (Tempelhof). These airports were considered to be not only nodes of European transportation and travel – for example, Croydon Aerodrome, which opened on 29 March 1920 as an operating base for Imperial Airways with regular scheduled flights carrying passengers, mail and freight to a number of European destinations (Paris, Amsterdam, Rotterdam and Berlin) – but also models for architects. The first architect-designed integrated airport terminal was at in Königsberg in East Prussia (today Kaliningrad, Russia). Built in 1922 by Hans Hoppe, it placed passenger services and administrative functions (check-in, customs), as well as a meteorological station, in a single Luftbahnof building in the corner of rectangular airfield, with big hangars to either side (Fig. 6).

All these developments brought a corresponding evolution in service staff, which extended to the handling of post and freight. Moreover, air travel promoted a new kind of international fellowship and

\(^5\) 1919 - First non-stop flight over the Atlantic (British aviators Alcock and Brown). 1927 U.S Air Mail Pilot Charles Lindbergh makes the first trans-Atlantic flight from New York to Paris and became the first man in history to be in New York one day and Paris the next.
cooperation, blurring the international boundaries between national governments and competing airline companies. The poster below from 1929 was designed to entice the public to become more mobile.

As planes flew directly between capital cities, the European boundaries became more fluid and airports became national gateways for international mobility – at least for wealthy passengers. Suddenly, air travel became fashionable, and by 1929 hundreds of thousands of Europeans had already been aloft. In Europe, most passengers were high-level businessmen or politicians, but also entertainers who could afford it. Moreover, it was en vogue for affluent high society Americans, movie stars, journalists, or statesmen to fly to Europe. But these passengers were not used to the rough conditions of flying over air currents and on shaky wings, so the planes had to be gradually refitted for their comfort and, of course, to ease their fear of flying. But as airports became “windows to the world” (Gordon, 2004), a new kind of public space began to take shape. Now, the task for architects was to define a more appropriate style of airport architecture. By the end of the 1920s, the shape of the airplanes themselves became a source of inspiration for modern designers and engineers, and architects found new names for the airport: air station, air depot, aerodrome, aerogare, Flughafen, stazione d'aeroplani, aeroporto. This seminal relationship between architects and travellers certainly marked the beginnings of conceptual airport circulation design\(^6\), including the symmetrical separation of arriving and departing passengers, the outer wings for the transport of freight, the waiting hall, the booking counters and the entrance. Croydon Aerodrome was the first terminal design with a

\(^6\)Circulation design in architecture deals with movement of people through space and perceptual experience of differential spaces (interior and exterior). Circulation is a path through floor plan with distinct spaces allotted to horizontal (e.g. corridors, lobbies) and vertical (e.g. stairs, ramps, escalators, elevators) circulation routes. Circulation design defines the course of the building and organizes its structure and space. Building functions can change over time, but the circulation between spaces will remain. Interpretations of circulation and organization space are discussed in architecture, (e.g. Benjamin 1999, Easterling 1999, Martin 2003, Fuller in Salter 2008).
symmetrical ground plan. This magnificent terminal building was opened in 1928 and set a new standard in air travel luxury.

Fig. 8. Main Booking Hall with “time-kiosk” at the centre. Attendant updated flight information. Croydon Aerodrome, London, c.1928 (Source: http://www.markfynn.com/images/Lon335.jpg)

But the revenue from scheduled air travel still remained low, so airport companies had to look for extra sources of income. They turned back to the fact that air travel was still an exciting public spectacle with considerable potential for revenue-generating facilities, so restaurants, visitor terraces and permanent viewing decks were built at airports. And, in addition to the passenger terminals, scenic joy flights were offered. All these developments together boosted the number of airport workplaces.

Fig. 9. Restaurant at Leipzig Airport Halle/Leipzig. Built 1929-1931 by Hans Wittwer (Source: Cuadra, 2002:28-29)

At this time state-sponsored European airports were ahead of US airport developments. In the US, architects relied on financing from private investors and the companies that manufactured airplanes. US airports also built their own runways and offered new levels of service and in-flight luxury, including flights for trade with Latin America. Prohibition attracted wealthy tourists to Havana for gambling, drinking and unrestricted nightlife. Many American entrepreneurs started to fly for business to Havana, Brazil, Trinidad and Guyana, causing American airports to become outposts for economic and geopolitical expansion – so much so that Alastair Gordon has called this development “aerial imperialism” (Gordon, 2004:41). But passenger trade extended to wealthy socialites and debutantes
who would fly away for a winter holiday, professional polo players, oilmen, bankers and mobsters. Airline business increased and investors started to buy into the aviation stock market. By 1929 there were more than sixty different passenger lines operating in the United States. (Gordon, 2004:29)

Airport designers also started to combine the concepts of flying and leisure, with the result that a range of ancillary recreational functions were added to the airport space: restaurants, gift shops, swimming pools, basketball and golf facilities, dancing on the viewing terrace, theatres, and even dog racing. (Gordon, 2004:28) All these changes brought business administration and advertising into the aviation industry. In this way, airports reached a new level not only of in-flight luxury but also of service to both the flying and non-flying public.

For the architects of this era, both aesthetics and technicality emerged as an issue. On one hand their designs focused on technical issues like special drainage, and runway alignment, and many airport builders followed the Ford Airport in Dearborn, Michigan, USA (1924), one of the first modern airports in the world to have a hotel, a concrete runway, passenger as well as airmail service, radio control and a passenger terminal.
On the other hand, a new interest in aesthetics was also emerging. Many architects believed that airports should resemble railway station and others relied on inspirations from the past. For example, the first airports in Europe resembled classical gateways or temples evoking ceremonial sense of entry and departure. They were designed to function as national gateways. Also, American architects adapted the neoclassical style in order to bring a humanist element in to airport experience (e.g. Boston- neoclassical entrance, Oakland - Greek pediments, Fairfax Airport in Kansas City-the eighteenth-century formal garden). Architects believed that airport terminals should be designed with more familiar and comforting styles (historical pastiche) to calm down excited and nervous passengers who were mostly flying for the first time.

Other visionary architects, for example Le Corbusieur, explored how air mobility might influence society, life and the city. He was fascinated with airplanes, believing that that they were symbols of the new age. In one of his essays he even compared the hangars of Orly airfield to the Gothic nave of Notre Dame (Corbusier, 1923). He proposed that an airport should be a new kind of threshold around the city, made essentially for speed.
The development of airports in the 1920-29 era blurred the boundaries between Europe, the United States and South America, allowing for economic expansion and international mobility. At the same time it created new roles for the workforce, including the construction industry, operating services, restaurants, hotels and advertising. The airport terminal became a new kind of public space (terraces with restaurants, viewing decks). A new form of airport architecture emerged: the airport terminal, with its focus on the concept of airport circulation.

**Speed and Accessibility of Air Travel (1930-1940)**

During the early 1930s air travel increased beyond the European continent, a development related to the need to maintain connections to the colonies. For example, in 1934 UK Imperial Airlines extended their routes to Singapore and Brisbane. While most of the business and diplomatic travellers were men, wealthy women flew the India route for pleasure and adventure. By the mid 1930s, with the level of air traffic increasing, most European airports were becoming out dated and had to be re-equipped, particularly with control towers. It was in this context that the new profession of traffic controller emerged.

But increased traffic had its impact on ground services, too, and a new circulation concept was adopted by architects Friedrich Dyrssen and Peter Averhoff in their design for Fuhlsbüttel Airport in Hamburg (1928-29). Here baggage was handled in the basement, passengers were serviced with tickets on the ground floor, and visitors could observe planes from the upper deck.

Here one can see how circulation concept attends to both, the technicality of distance and corporate and capitalistic interest of aesthetics.

This concept soon became the standard solution for other airports. Airlines started to compete with railways in their advertising of speed, efficiency, safety and comfortable service. But it was speed that
soon became the greatest virtue at the airport, speed of ticketing, speed of transfer, speed of baggage handling and speed of boarding and departure. Moreover, in cities like Hamburg, rapid access was possible with a tramline that ran directly from the city centre to the terminal.

One of the most obvious examples of the circulation concept was the design by architect Ernst Sagebiel of Tempelhof Airport in Berlin. (1936-39). Sagebiel combined all the functions - like on loading, plane maintenance, holding areas, off loading - in one building under a single roof resting on steel girders. The enormous structure, which featured a cantilevered canopy over the front apron, covered both the side hangars and the central checking area. Here, the whole airport design was literally constructed around a circle, with the terminal building forming one quadrant. It was designed for speed, with passengers being separated and streamed according to direction they were travelling (arrival or departure). Soon, Tempelhof functioned as a seminal design for other architects in Europe and the US.
The speed of air travel and proximity of the airport to the city was also addressed by the French modernist architect André Lurcat in his project proposal for an airport in Paris. He argued that an airport should satisfy “all the needs of people”. Paris airport should not, therefore, be located 45-60 minutes away from the city centre (Le Bourget airport) but right in the heart of the city, at the foot of the Eiffel Tower.

According to Gordon, it was precisely during the Depression that these dreams exploded, fed by the hopes and potentials of a bright future. In the US recession, hardly anybody could afford to fly. However, president Roosevelt understood the importance of aviation as a practical as well a symbolic necessity in the nation’s recovery. Believing that improved commercial airlines would speed the movement of both people and goods and stimulate the economy, he set up back-to-work program that gave jobs to unemployed men upgrading runways (e.g. adding concrete, changing the alignment and lengthening them) or working on other construction projects. Surveyors, architects and engineers collaborated in the renewal of airport networks. In order to encourage people to fly, neatly dressed porters and stewards were employed to attend to passenger needs in the airport.

Austrian-born architect Richard Neutra, in 1930, and American industrial designer Norman Geddes in 1932 both argued that the airport was essentially in transition rather than in possession of a full architectural style and that attention should be put into designing reliable passenger movement concepts to allow for speedy transfer. A good example of this shift in design thinking was the terminal building at La Guardia Airport (1939), with a circular skywalk observation deck on the roof (Fig. 16). The building was designed as a long boarding dock that extended from both sides of the central entrance hall and provided for efficient circulation of passengers and visitors on separate levels. Incoming passengers could proceed directly to their gates and out to the taxi stand without passing
through the terminal. The skywalk was really a revolutionary example of airport planning in the US and a precursor to the “pier” extensions that came later in the 1950s.

Fig.16. The terminal building, forecourt and Skywalk observation deck at La Guardia airport, New York, 1939

The interest in increasing the speed of processing and travelling passengers was a major factor to consider in the design of new airports in the 1930s. Of particular importance was the circulation concept, which focused on fast and efficient service and the heightening of the traveller’s experience both on the interface between air and ground. As a result, new jobs were created that not only helped to relieve unemployment during the Depression, but continued on as part of the established structure of airport employment and created new permanent positions. (Gordon, 2004:98)

The Rise of the Civil Aviation Industry (1945-1958)
The increase in air traffic after World War II caused great changes. As air trade reopened, it became clear that it was based on a new concept of civil aviation in which the convergence of military, political and commercial interests was the defining factor. For, in the post-war world, America, one of the victorious allied powers, now dominated global politics, while Europe had to focus on rebuilding its own immediate future. And the US aviation industry played a key role in the consumer-friendly business expansion of the American empire (capitalism) and promotion of the "American Dream" of relentless mobility and material prosperity of the individual. The image was often associated with the steel and glass skyscraper architecture of the international movement (e.g. New York Seagram’s Building by architect Mies van der Rohe) adopted by corporate firms employing a "white collar"

7 The "American Dream" is the national ethos of the United States. American historian James Truslow Adams coined the term in 1931 in his book Epic of America. It had to do with the idealism of prosperity, success, and an upward mobility achieved through hard work in society with no social barriers. He wrote: “It is not a dream of motor cars and high wages merely, but a dream of social order in which each man and each woman shall be able to attain to the fullest stature of which they are innately capable, and be recognized by others for what they are, regardless of the fortuitous circumstances of birth or position”.

8 “White-collar” worker is the term coined in 1951 by American sociologist C. Wright. It refers to professionals and salesmen, doctors and military generals, alongside clerks and stenographers. At this time, white-collar workers constituted just under half of the American workforce. They were an emerging group whom most observers saw as replacing the old middle class of artisans and small shopkeepers – characteristics of this new middle class had to be defined. (Saval 2014, Kindle, pos 145, chapter1)
workforce—the emerging new middle class. This growing group of salaried workers could afford vacations overseas, and within five years (1945-50) more than a million people from the US had flown abroad (1950).

Not only air traffic but also retail concessions dramatically increased, accounting for more than a third of airport revenue, even though most airports – O’Hare (Chicago), Friendship Airport (Baltimore and Washington), Idlewild (New York) – were situated 10-30 miles from their respective city centres, to which they were connected via highways. (Gordon, 2004:150) In many cases this level of expansion was challenging and architects were asked for radical solutions to urban and airport planning. For example, Eastern Air Lines Inc. engineer-architects Charles Froesch and Walther Prokosch reacted by proposing new kinds of urban clusters called “Air Cities” (Airport Planning, New York, J. Wiley 1946). These “Air Cities” would supplement the old city centres in unpopulated areas, creating future suburbs that were 100 or more miles from the centre of any metropolis. This decentralised point of view was also shared by the American architect Frank Lloyd Wright, who believed that airports should be spread our across the countryside, well removed from the dense urban core. In his plans for Broadacre City (1932-1958), Wright placed the airport right outside of town near the golf course (Fig. 17).

Other architects fully understood the potential of retail marketing at the airport. For example, Gordon writes that in Harrison’s project for Idlewild, the passenger became a kind of consumer guinea pig, guided along a route that that was calculated to "produce a maximum of concession revenue." After

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Fig.17.  Frank Lloyd Wright’s sketches for Broadacre Project. (1932-1958) He proposed a car, and eventually an "aerator" (a helicopter that could land without a landing strip), for everyone.  
(Source: http://www.itaproject.eu/TTU/5/05_images/a11-Broadacre-Wright_06.jpg/)

26
checking in, passengers had no choice but to walk through a shopping arcade with well-advertised, high revenue generating stands, shops, food, and liquor vending establishments. Additional designs were based on direct access to the theatre and a restaurant with a panoramic view. In this unrealised project, Harrison envisioned the airport as a monumental machine for processing air travel, the kind of infrastructural system found at today’s airports (Gordon, 2004:154).

In the 1950s, airports became new gateways to a world that promoted the cosmopolitan American lifestyle as a luxurious alternative to communism. This dream led to the establishment of hotels, shops, and restaurants within the airport itself. And as the dream became commercial reality, it was exported to other (non-communist) parts of the world, for American businessmen and tourists needed clean, comfortable, air-conditioned places to stay when they travelled, whether for work or leisure. This marked the real beginning of the constant traveller – a concept that underlies this dissertation. The horizontal expansion of airlines into all modes of transit luxury displayed the precedence-for a time when business travel would become almost compulsory. For example, in 1946 American businessman Juan Trippe established the Intercontinental Hotel Corporation (IHC) and began to build hotels in partnership with the Waldorf-Astoria group outside the USA.

European airports, on the other hand, had been largely demolished by the war, particularly in Germany, and what was left was demolished in the post-war building boom. Germany was forbidden to operate its own airlines until 1955, but Tempelhof was in the American sector of Berlin, so it continued to operate and flourish. It was from there that the first commercial flights left Germany for North America. The exception to the state of affairs in Europe was Switzerland, which had suffered little from wartime deprivations and was the first country to build a major new facility – Kloten in Zurich (1953) (Fig. 18). Operating like a first-class hotel, Zurich Airport was the most luxurious in Europe. (Gordon, 2004:159) The main terminal featured lounges with showers, playrooms for children, and one of the best restaurants in Zurich. This combination of luxury with capitalism led to a new role of the airport as a fascinating place to visit and "be seen".

Fig.18. Zurich Airport, Switzerland. Built in 1951-53 by architects Alfred and Heinrich Oeschger. (Source: Bauer&Loosli, 2008:27, 39)
After the war there was a massive shift in airport design from military service industry to luxury environment. Airport design underwent a transformation to deal with this mass transit, and for the needs of constant business travellers and an increasingly affluent middle class in terms of comfort and luxury.

**Showcase of Jet Mobility (1957-69)**

The single factor that impacted air travel most significantly in subsequent decades was the jet engine. An invention of the pre-war years, it first saw service in German and English military aircraft towards the end of World War II. But by the 1950s a new level of civilian jet mobility had developed. Boeing Commercial Airplanes Company produced its first four-engine jet airliner in 1954, and the Boeing 707 evolved from prototype "Dash 80" to become the fastest, longest range. (http://www.boeing.com/) Boeing 707 could seat 140 passengers and made flying possible for many citizens. These planes were larger, much faster and smoother than the propeller airliners and consequently changed the face of international travel. Here we see the beginning of the volume of mass transit in the passenger experience. In consequence, travel by trains and ocean liners went into decline, tickets became less expensive, and trans-Atlantic air traffic grew rapidly. One could bargain the price by flying last minute (stand-by tickets) or on charter flights. This increase in volumes of air transportation was also felt on the ground, while passengers were transferring from their cars to terminals, checking in, rushing to the boarding gates, using escalators and moving sidewalks, getting on planes and picking up baggage from baggage carousels: distinct spaces of vertical and horizontal circulation routes. (Koolhaas, 2001:337-365)

However, in the plane the concept of "speed" was unnoticeable. As Gordon has suggested:

> Air travel, though, was lacking in sensation, because jet speed was something hardly felt*. While the early days of flight created a new awareness of landscape and architecture, the view from the jets made everything look the same. Distinctions were blurred at an altitude of twenty three thousand feet. (Gordon, 2004:176)

Passengers became bored and this factor began to affect the design of the passengers’ travel experience. The advertising industry tried to sell commercial air travel by comparing it to a seductive sexual adventure. Jet age terminals included cocktail lounges and even, as Gordon observed, places to flirt:

> Playboys and party girls wandered through departure lounges catching their reflections in floor-to-ceiling mirrors, exploiting the anonymity of international time zones. Sexy dancers entertained jet-lagged businessman at the Tiger A-Go-Go lounge at San Francisco`s Airport”. (Gordon, 2004:180)

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9 “The introduction of jet aircraft, such as the Boeing 707, provided a major boost to the flagging civil aviation industry. Faster, quieter, more comfortable and able to fly longer without refuelling, jets began to make passenger services financially viable. The first full jest services in the early 1960s spawned a new popular vision of aviation as accessible to the ‘common man’ - flight itself had become a commodity.” (Fuller,G.&Harley, R., 2004)
The word "jet" became a fashionable word evoking speed and modernity like jet set – connoting a lifestyle, jet way (used for a telescoping passenger ramp) or jet wash (for a high pressure wash or car wash).

At the same time, haute couture fashion designers were commissioned to design uniforms for airline stewardesses, who should please the eye of tired businessman or other constant travellers. It was a new look in fashion for both stewardesses and passengers - their function became aestheticized (Black 2011, Braniff Airways "The Air Strip") For example, designers Alexander Girard and Emilio Pucci were commissioned by Braniff International Airline to develop a comprehensive marketing concept for corporate design. Their answer came in many colours: futuristic uniforms, seven different colour airplanes (never fly the same airplane twice), check-in counters, waiting areas, and even baggage tags (Fig. 21).
Architects took up a similar challenge and designed gigantic new self-contained urban complexes called "jet age terminals", built to accommodate both business and tourist travellers. These terminals not only served millions of passengers a year, providing them with places to sleep, shop and eat; they also hired thousands of new service-trained employees. The workforce of the airport space changed accordingly. Companies start to build offices and plants in the proximity of the airport, seeing the potential of the airport as a city for businessmen, corporate managers and the first "knowledge workers", a place where they could fly in for an all-day meeting, have a dinner and a few drinks, and fly home in the evening.

The airport became a gateway to what was billed as the "jet age", and in this context took a huge step towards promoting a luxurious relationship between the passenger experience and interior design.

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10 “By the mid-1960s, Idlewild /Kennedy was providing employment for over nineteen thousand people earning collectively over 150 million dollars a year. Jet-age airports would have their own police and fire departments, power plants, fuel dumps, dentists, doctors, hotels, conference centers, and, in some cases, theatres, nightclubs, and churches.” (Gordon, 2004:184).

11 “Knowledge workers” is the term coined by Austrian theorist of management Peter Drucker in 1962. Drucker argued that a transition was taking place from an economy based on material goods to one based on knowledge. He observed an emerging group of workers that was becoming central to this economic change. They were highly educated, creative “white collar” technical and professional workers who were paid to think, and who thus controlled what was becoming the most important resource of all: knowledge. In the same year, Austrian-American economist Fritz Machlup introduced the concept of the knowledge industry. He distinguished five sectors of the knowledge industry: education, research and development, mass media, information technologies, and information services.
A first example of this relationship was Idlewild (later JFK) Airport, New York, where in order to avoid building single mega-structure terminals, airport authorities and architects came up with the concept of the "decentralised airport", a "Terminal City" with a cluster of separate structures – in fact seven distinct airport terminals – for the various airlines, connected by a looping access road (Fig. 22). In this way the individual airline companies would have even more control over their activities on the ground. Each terminal would be different and each airline company could hire its own architects to compete over their contribution to airport design. Moreover, because of the massive explosion of private automobile use, "Terminal City" was designed for car mobility rather than for pedestrians\(^\text{12}\) – an example of where real passenger needs were overshadowed by the popular technology of the day.

Idlewild became a major sightseeing attraction creating showplace atmosphere around air-travel that clearly advertised the new “American way of life”. And, as can be seen from the next image (Fig. 23), terminal architecture became a major marketing and advertising tool for the airlines themselves. In relation to social mobility, too, the TWA terminal in Idlewild strove to reach new heights. Here Finnish-American architect and industrial designer Eero Saarinen wanted his terminal to be "the place of movement and of transition" expressed by a dynamic concrete roof structure. He used a holistic approach to the design, putting his stamp on the building’s every detail, including the information

\(^{12}\) "No provisions had been made for rapid-transit links, even though two of the city’s subway lines came within striking distance, and a stop on the Long Island Rail Road was only a few miles away. Instead of mass transit, millions were spent on a new highway system". (Gordon 2004, p.189)
board, lights, staircases and even railings. Saarinen’s iconic airport became an architectural masterpiece, but unfortunately it was unable to accommodate the needs of a constantly growing car culture, air traffic, airplanes and security restrictions. Again, the growth in air traffic volumes seemed to be outpacing design.

Fig. 23. The airport as an icon of the modern vision of progress. TWA Terminal at John F. Kennedy International Airport, New York, Eero Saarinen 1956-1962

In the early 1960s, hitherto unprecedented levels of mobility arose. The "new nomads" slowly became more glamorous jetsetters, but in terms of this research, it was the fact that new groups of people were starting to travel for corporate business reasons that needs attention. For the first time in history, the role of the architect and designer changed. They were forced to re-think not only the impact and appearance of airplanes and personnel, but also the role of the airport as a new city, built in the service of the jet and of passengers with economy, as well as business class, tickets.

**Mass Travel as a Processing System (1970s)**

In fact the introduction of economy tickets between 1955 and 1972 caused US passenger traffic to rise from 7 to 32 million. (Gordon, 2003:218) By 1970, O’Hare had become the busiest airport in the world, with 14 million passengers in the same period. During this time, the freestanding futuristic airport terminal lost its architectural identity, and the airport became instead a processing system consisted of long term parking lots, freight depots, discount hotels and gas stations. The workforce became as systematized in processing passengers as the airport that housed it, and the airport space began to mirror the complex geometries of air traffic itself. Terminals became boarding satellites, and conventional entry and transition points disappeared. Instead, finger piers were developed that could be t-shaped, straight, split-finger or sprocket-shaped.¹⁴ (Pascoe, 2001; Cuadra, 2002: 40-45; Gordon, 2004:175) These finger piers were connected with ground transportation centres, parking lots and

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¹³ In the 1960s /70s, many artists, architects and designers (e.g. Constant, Archigram, Cedric Price) developed utopian visions about the future city, mobility and technology and computers. For example, Austrian architect Hans Hollein proposed the inflatable mobile office that provided take-along-workspace to blow up. He pictured himself as "new nomad" with drawing board and phone at a stopover in the airport. In the short video (https://www.youtube.com/watch?v=2hkG1PzXumU) he calls up his client to inform him about his project development status.

¹⁴ Pioneer airports with an expandable pier-like system were Chicago, New York, London and Amsterdam.
hotels. This reduced the terminal to a seamless enclosure with retail flexibility. In other words, it became more of a passageway than an architectural building. The materials changed as well; there were cheaper constructions of steel and glass with concrete or ribbon aluminium. Automated movement systems expanded into every airport during this period, like moving sidewalks; passenger escalators and baggage conveyors provided connections between buildings and aircraft. As Gordon suggests, the passengers found these endless corridors and passages disorientating and frustrating.

As the number of hours in flight decreased, the time passengers spent walking to and from the aircraft increased. This added to the disorientation. In response, graphic designers were asked to help passengers find their way to their planes by designing consistent signage – in other words, to help establish continuity in the terminal flow. Simple lettering, pictograms and signs were designed that were easy to read for non-English speaking passengers who needed to rush to their planes. (Cresswell, 2006; Fuller & Harley, 2002) Colour coding, video displays and directional signals were also added.
For example, interior architect Kho Liangie and graphic designer Benno Wissing introduced a colour-coded sign system at Amsterdam’s Schiphol Airport in 1967 that is famous even to this day (Fig. 25). They used a "passengers first" concept that stripped signs of any non-essential information and instead began to visually classify types of information by colour. This signage for Schiphol Airport is still well known for its clear writing and thorough colour coding. The designers actually prohibited any other signage in the same airport space that used the colours yellow and green. (Cresswell, 2006:241-246) This novel approach, marked by simplicity and straightforwardness, was not only new but also immediately successful and other designers imitated the sign system in whole or part for other airports and transportation hubs. Liang and Wissing applied wayfinding methodologies for the design of airport signage. This successful design approach focused on the user needs and spatial interactivity. As Australian airport theorist Gillian Fuller points out, airport signage became "an interface for social exchanges between humans and technology" that "virtualises the social relations of individuals into the anonymity of crowd control." (Fuller, 2002:233)

As I suggested earlier, interestingly enough, while air traffic was increasing, the excitement of flying was fading and air travel quickly became equated with boredom and disaster, emotions that are still active today. In relation to the emotionally disturbing increase in traffic and mobility, people started to organize rallies and protests against the noise, pollution and excessive traffic that accompanied and arose from airborne travel. In addition, airline terror became the fastest way for extremists to gain global attention. In response to increase in hijacking incidents, airport authorities became suspicious towards air travellers, and airports adopted much stricter security measures. In fact by the end of the 1970s, most international airports were equipped with metal detectors to scan passengers and a new security checkpoint workforce was born. These jobs consisted of separating travellers from accompanying families and friends, and the airport soon became divided into "sterile" and "non-
sterile" zones. Immigration became a major issue and both the interior and exterior of the airport was under constant surveillance. This changed the experience of flying considerably: in contrast to the jet age of the 1960s, it became a transition process full of suspects. (This issue will be dealt with in the chapter 2). The pressures of mass transport required that new architectural design approach as had to take into account logistical concerns more than ever before. The airport became a mechanical, passenger processing system designed by airport analysts and architects. Final plans resembled schematic diagrams and gave a rise to style known as the "intermodal airport". In the later 1970s, this intermodal concept included satellite trains connected to the main terminal for the convenience and speed of transit in and out of airports.

As can be seen from this short survey of the history of airport design and the influences on it of the airport industry and the passengers themselves, mass travel has driven several distinct waves of evolutionary development towards the design of new system-oriented, finger-dock-dominated constructions. Concomitantly, new workforces have been employed to cope with these changes. In relation to the travel experience, in the 1970s, the main focus shifted from luxury to managing flow of passengers who required wayfinding assistance to navigate this new complex environment.

### 1.2 Airport Territory as Network

Until the 1980s, architects were exploring the most suitable form for airports, looking for the best ways to process passengers and establish rapid access to the city. At the same time, business developers were ensuring airport revenues by expanding airport functionality (viewing deck, restaurants, shops, hotels, etc.). As airports evolved, they became important business and employment generators. But they still remained mono-modal means of transportation, specialized in transporting people and goods between cities by air.

![Fig.26. Mono-modal transport system. Graphic by Güller & Güller, 2003](image_removed)

With the advent of the 1980s, airport terminals expanded into airport territory and emerged into transportation networks for global business mobility. Since the 1960/70s, western societies had slowly
been undergoing a transformation from industrial to post-industrial societies,\textsuperscript{15} and air travel had become an aspect of work. It is this development that will concern us in the following pages.

\textbf{Network of Hubs & Spokes (1980s)}

The US Airline Deregulation Act of 1978 marked the dividing line between the modern and postmodern periods of commercial aviation. This act removed the barriers to open competition in the US by removing monopoly control over commercial fares and routes. New airlines entered the market, while leading ones (e.g. National, Pan Am, Western and Eastern, TWA and Braniff) went bankrupt. This changed the aviation industry dramatically, forcing traditional airlines to reduce their operating costs. A new hub and spokes system grew up, and soon dominated point-to-point connections (origin-destination). This involved network centralization around a hub airport (central interchange), enabling optimal use of bigger airplanes on concentrated routes. But it also meant that passengers flying to remote destinations (spokes) had to change planes in the hub airport. More importantly, the hub airport attracted much more traffic and enabled more destinations to enter the network. But to maximize interchange potential, hubs had to be located along major traffic routes. Among the first established airport hubs in the US were Atlanta, Chicago, and Dallas.

From the airport planning perspective, airport hubs demanded transfer-friendly configurations for passengers and goods: fast baggage sorting systems, new circulation patterns, well organized transfer facilities, and seamless connections to the regions. Airport planners consequently reconfigured airports from intermodal to multimodal transport systems, and airport terminals became not only part of the national and international airline network but also an integral part of the regional transportation network, seamlessly connecting planes with trains, metro systems, buses, taxis and cars. By providing efficient transfer between air-transportation with already developed transport modes (car, rail, water) airports turned into complex and integrated infrastructural systems reshaping their region and its society.

\textsuperscript{15} Post-industrial society is one of the terms used in academic discussion originated in the 1970s and initiated by Peter Drucker with his argument about the knowledge economy. French sociologist Alain Turrain referred in 1971 to the economic transition of industrial society in the means of production of symbolic goods that modify values, needs, and representations. He argued that post-industrial society changes the end of production, that is, culture. Furthermore, for American sociologist Daniel Bell a post-industrial society is based on services, where a majority of those employed are not involved in the production of tangible goods. In the 1980s, the Organisation for Economic Co-operation and Development (OECD) defined the information society as a society where more than half of the GNP is produced and more than half of the employees are active in the information economy.
By the end of the 1980s, airports were considered to be not only employment generators but also important means of everyday transportation, at least for highly mobile, decision-making politicians, and business people, whom German philosopher Peter Sloterdijk has described as a "kinetic elite" (Sloterdijk, 1997). At about the same time, the visionary American pilot, engineer and politician, McKinley Conway identified the executive as the individual who has the greatest degree of mobility yet devised. He called this new class of executive (company presidents, sales managers, regional managers etc.) "flying businessmen", because they used small airplanes as most people use an automobile. He explained that their perception and approach to business situations was changing, because these new flying executive spent most of their business travel time sitting in the pilot’s seat. In comparison to other executives, the flying businessman "speaks a different language; he travels a different route; he sees cities and areas in an entirely different light" (Conway, 1980: 83).

In the United States of the 1980s, the efficiency of air transportation as a door-to-door system for short trips of less than 500 miles started to improve, forming a network of industrial and office fly-in-parks, fly-in-communities and fly-in recreational resorts. Conway identified three types of airport facility: international-national career centres (intermodal passenger and cargo traffic), regional-local growth centres (small metro-areas with offices and industrial parks), and freestanding centres (resorts, recreational and residential developments).¹⁶

¹⁶ Conway argued that most people conjure up an image of a large jet serving a major city by air carrier (scheduled airlines), but the term general aviation applied to aircraft operated by business firms and individuals. In 1980, there were approximately 900,000 pilots in the U.S. Some 96% were in general aviation and only 4% worked for the airlines.
Fig. 28. The first fly-in community, in Spruce Creek, Florida, opened in 1979. The gated enclave and residential airpark, which surrounded the airport on all sides, included homes, a championship golf course, country club, and 24-hour patrolling security service. The residents enjoyed their new lifestyle of the business executive with his airplane at his door. (Source: http://www.sitenet.com/books/forecasting/images/spruceCreek.jpg)

The 1980s airport was no longer just a terminal for air travel: it followed the development path of other transportation modes. Airports became intermodal networks of hubs and spokes, initiating the fourth wave of transportation-oriented change in regional development and work patterns ("kinetic elite") brought by air-transportation.

**Airport as City (1990s)**

In the 1990s, the hub-and-spokes system was also applied in Europe, but national markets were still owned by national carriers and the deregulation process moved slowly. Alliances were formed to increase the concentration of intercontinental traffic at four European hubs: London Heathrow, Paris Charles de Gaulle, Frankfurt, and Amsterdam Schiphol. As a consequence, some national airlines went out of business (e.g. Sabena in 2001, Swissair in 2002). Nevertheless, as the multi-modal concept of the airport emerged, airports began to trigger other improvements in the regional infrastructure (highways, public transport), and airport hubs became characteristic elements of the metropolitan area. They enhanced the economic shift from the city to the urban periphery. The Zurich-Glattal corridor, Amsterdam- Zuid-As and Helsinki Vantana Airport City are examples of such regional expansion of airport territory in Europe (Fig. 29).

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17 The first waterfront developed as a center of activity while ships were transporting goods and people via water. Another similar era of development occurred with the coming of railroads. Again, as rail services grew, the rail yard became the centre of the city. Another wave of development occurred with the arrival of the automobile (McKinley Conway, 1977)
Airports already employed very large daily workforces but these developments attracted even more airport-related activities like shopping, wellness and entertainment facilities at both airside and landside, with corresponding impact on regional society and employment.

Many corporations moved out of the city centres at this time in favour of proximity to the airport. For example, the landside of Schiphol Airport contains a World Trade Centre and several other multi-
tenant offices, as well as Sheraton and Hilton hotels directly linked to the terminals via covered walkway (Schaafsma, 2003). These developments and similar ones created major housing needs in the regions adjacent to airports.

As the new centrality and virtual autonomy of the airport emerged, airports developed their airside as well as landside activities. Functional and spatial evolution transformed many major city airports into an “airport city” in its own right, where transitory inhabitants of every type – package tourists, transnational migrants, refugees, kinetic elite and locals – conducted business, exchanged knowledge, and performed their daily activities within 15 minutes from the airport.

The airport no longer relied on high-tech architecture style, runway capacity or passenger comfort alone. In the 1990s, Airport competitiveness was measured by the level of improved transfer between air and rail (inter-modality), and the self-financing ability of operations (public-private management of airports), enhanced by the growth of additional airside and landside business offers (e.g. expanding shopping malls, business conference centres, landside development, concessions). Moreover, connections between hub-airports intensified, forming global alliances and creating multi-hub systems (e.g. the Frankfurt-Schiphol deal, known as the "Pantares" alliance). These multi-hub systems stimulated not only heavy traffic flows but also a reorganization of airport authorities (with a master-planning department, real estate branch, international affairs office etc.), similar to local authority structures and global marketing activities. The result was a still higher market share for the airport hubs, with increasing cargo and passenger traffic. And with the development of these hubs as global centres in the worldwide airport network, their adjacent regions also started to gain economic importance on a global level.
The newly configured airport network of hub-and-spokes and the multimodal system of transportation resulted in a new level of urban centralization around the airport. This caused a diversification and expansion in the airport and airport-related workforce. At the same time, air-travel became integrated into an urban as well as global network of inter-connected transportation modes.

**Aerotropolis**

In recent years, besides "airport city" many other terms have been proposed to describe the airport’s role in shaping regions and cities, among them "airport corridor" (Schaafsma), "Aviopolis" (Fuller and Harley), "Airera" (Schlaak), and "Aerotropolis" (Kasarda). Such terms indicate a new stage in the changing typology and development of airports. The last of these terms, "Aerotropolis", was coined by the American academic and air commerce expert John Kasarda to define the role of aviation and airports in shaping 21st century business locations, urban competitiveness and economic growth (Fig. 32). Kasarda points out that advances in ICT, new supply-chain management systems, time-based competition (JIT), production flexibility, mass customization and perishability are the drivers for the current stage of airport development – a wave of aviation-driven development providing connectivity, speed and agility. Moreover, "Aerotropolis" has become a physical interface of Castell’s "space of flow" of goods and knowledge in globally mobile societies.

![Image has been removed due to Copyright restrictions](image)

*Fig. 32. The "Aerotropolis" Advantage: speedy global connectivity.*

*Video explaining the new concept of "Aerotropolis": creating urban competitive advantage in the 21st century.*

2011 (Source: https://www.youtube.com/watch?v=Oy3OSm1w-jY)

Some of the features of "Aerotropolis" like intermodal freight and passenger hubs, office parks, office corridors connecting air-travel-intensive executives and professionals quickly to distant markets,
exhibition and conference centres, hotels, entertainment facilities, and retail clusters are already part of some airports. But new features concerned with global trade have emerged: for example, well planned physical and commercial infrastructure, smart logistics infrastructure and just-in-time manufacturing, free trade zones, e-commerce and distribution, allowing rapid, so-called flex-tech response to customer orders (source, assemble, repair, ship quickly). Other new features introduce new services such as a medical and wellness cluster for medical tourism and healthcare provision, an academic and research cluster for executive education and research, and mixed-use residential areas to house and serve the "Aerotropolis" workforce.

The newest development by Zurich Airport Authority exemplifies this type of airport hub. "The Circle", designed by Japanese architect Riken Yamamoto, comprises a 180,000 square metre complex
for business and lifestyle, featuring brands, medicine, learning, culture and entertainment, hotels and congress facilities only 15 minutes from downtown Zurich. The developers claim that the Circle will be Zurich’s second centre and will "buzz with an international flair that will set new standards for Switzerland" (http://www.thecircle.ch).

Fig. 34. Scheme and overview of “The Circle”, presenting location, airport connectivity and “seven modules with synergies”. (Source: http://thecircle.ch)

The seven different functions of the complex represent high-growth business opportunities, and each seamlessly extends what is already on offer at the airport, attracting similar target groups. In this project, investors hope to create a space that will meet the demands of a networked society and "bring together the right people in the right place at the right time." (http://thecircle.ch) The question remains if the proposed mix of uses will fully support the work style and requirements of constant travellers – the focus here is on brand experience in shopping clusters, offices (ranging from individual rooms to mixed and full open-plan floors), a 24-hour emergency clinic, and further out-patient or short-term in-patient services for employees, commuters and local residents, a campus with room for training and further education courses, as well as training for executives or MBA seminars.
Airport Territory as Interface

Fig. 35. Photorealistic rendering representing the Circle project. (Source: http://www.thecircle.ch)

Over the past 100 years of airport evolution airports have not only transformed from airport terminals into airport territory but have reconfigured the role of city centres. Today, the airport is identified as an urban territory impacting and shaping a whole region.

Summary for Chapter 1

In this chapter, I have shown that advancement in technology, economy and air mobility gradually transformed from a place of transit into a place suitable for constantly moving, always working constant travellers. This had several phases:

- At first inventors and new business development entrepreneurs stimulated pioneer roles for workers. Gradually the new professions and specialists emerged (e.g. pilot, traffic controller, steward, porter).

- Further development of airport facilities blurred the boundaries between continents and triggered economic expansion. This created a new workforce for the airports including the construction industry, operating services, restaurants, passenger services and jobs in advertising.

- During the economic recession developments concentrated on heightening the traveller’s experience in the air and on the ground, and the potential of the airport as an employment generator was fully recognized.

- The rise of the aviation industry after World War II saw a shift from military service to commercial activities in the luxury sector. This triggered the establishment of a workforce on the ground to service a privileged group of travellers.

- In the jet age two new groups of people started to travel: one for business and one for pleasure. The latter group was associated with the emergence of a new middle class in America ("white collar" salaried workers employed by corporate organisations), which rapidly extended to an ever-larger swathe of the populace: air-travel was now possible for millions of passengers, creating employment for new workforces to cope with these mass changes (e.g. security, passenger processing staff).
With the rise of globalisation and the knowledge economy, air travel followed the development path of other means of transportation: airports became intermodal networks generating employment for entire regions.

With these developments in air transportation, the kinetic elite was the first to establish new work and air travel patterns. Today, corporate, professionals and other kinds of knowledge workers (e.g. start-ups, freelancers) have adopted this trend.

The architectural form had to attend more to the expediting of flows of passengers, as well as multifunctional activities. However, because of increasing traffic and complexity, as work-related and business travel developed, and as surveillance systems and paranoia emerged, each of these changes required new design responses. These new designs in turn enabled other design developments to occur. Although the passenger experience was seen as a key element in the architect’s task, the designs still did not address the actual needs of knowledge workers-on-the-move or constant travellers, who are the focus of my dissertation.

In the next chapter I will analyse in detail how airport design impacts passengers’ airport experience, because these impacts also directly relate to the needs of constant travellers.
Chapter 2.
Interface in Airport Flow. How Are Airports Designed for the Passenger Experience?

As I have shown in the previous chapter, the control and speed of passenger flow is the main area of concern when designing airport terminal. There is a need to optimize airport profits deriving from non-aviation operations, because stress has also become an issue in the passenger experience (e.g. stress due to security lines). Airports need to find solutions for the complexity of these problems. In order to solve these problems the airport can be seen as the laboratory for the future or "Aviopolis" (Fuller & Harley, 2004). In this chapter, I will argue that airports focused too much for technological solutions and did not consider the passenger experience and their needs in this evolving airport architecture.

This chapter investigates the experience of airport flow from a passenger perspective and examines how passengers’ emotions are manipulated by design strategies. It also discusses how airport design and technology, developed for electronic surveillance, merges into the hybrid space of the airport. Many interpretations have been proposed for this new type of transit space (Augé, 1995; Rosler, 1998; Gottdiener, 2000; Pascoe, 2001; Fuller&Harley, 2005; Cresswell, 2006; Salter, 2008; Dodge & Kitchin, 2011). The interpretation offered here differs from these, inasmuch as it focuses on the design of the airport experience for passengers travelling for work.

2.1 Passenger Experience of Airport Flow

I will discuss here how design for passenger flow has contributed to dehumanizing experience, with exhausting walks, growing tension and discontent at security thresholds. Privileged passengers can experience air travel as a luxury lifestyle factor, with door-to-door personalized assistance. I will also outline how the airlines and the airports have developed mitigating strategies to offset the tedium and delay of security checks only by offering the privileged passengers as air travel lifestyle luxury with door-to-door personal assistance.

Exhausting Walks and Boredom (System for Processing Passengers)

As I have shown in the historical chapter, airports have evolved into complex systems for processing passengers. Built initially for the speed and convenience of passengers, airport terminals have evolved into buildings expressing the idea of "transfer" between fingers marking one’s desired destination. Today, the main purpose of the airport is to manage and increase passenger flow. In order to increase passenger flow, airports had to scale up to sizes that eventually created enormous inconveniences for

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18 U.S. airports, by definition of the Department of Commerce, are "primarily the service center for the transfer of passengers and their property between surface vehicles and aircraft" (Vidler in Rosler 1998:14).
In 1958, the average passenger would walk from his or her parked car some 650 feet to the ticketing counter, and from the ticketing counter a further 950 feet to the aircraft (Saarinen, 1958). This also applied to interchange passengers. In a study of service and convenience at Washington International Airport, architects and engineers noted that the imminent dispersion of these facilities to accommodate growing traffic would lead to customer dissatisfaction. Loaded with hand luggage, they would have a long walk with up and down ramps, endless corridors, and doors. They warned that walks that were once filled with the romantic anticipation of adventure would become more and more irritating because of the dramatic change of size required for jet planes, with an elaborate "finger system [...] a bewildering maze of building and passages, [and] the serious problems of fumes, and noise, and blast, the handling of service equipment [...]" (Saarinen, 1958)

Indeed, contemporary airport transfer architecture consists of uniform endless corridors. American artist Martha Rosler, who flew extensively for work-purposes in the period 1970-1998 published photographs documenting her personal experience of the airport public sphere. She described her experience of flow in the airport system: "When I became something of a frequent flyer, I felt like a displaced person, wandering or hurrying through a world made by someone else for someone else [...] when I was traveling, especially in the terminals, pushing my baggage cart, I was tired, sweaty, overburdened" (Rosler, 1998: 22).

Fig. 36. Video stills: Long walks to gates, disorientation, fumes and noise are the consequence of the "expanding airport". Ammann & Whitney, Eero Saarinen, Burns & McDonnel, Ellery Husted, Architects and Engineers for Washington International Airport. Charles and Ray Eames 1958. (Source: http://vimeo.com/4139559)
The flow of passengers is calculated and strictly controlled and often becomes uneasy because of delays. Transfer passengers rushing to the gates traverse long corridors almost without registering them.

Furthermore, Rosler observes that airline attention is focused mainly on departing passengers, to prevent them from causing delay. Arriving passengers are left to fend for themselves. Moreover, in the entire experience of transfer in the airport, face-to-face hospitality is reduced to a minimum. The link between individuals and airport surroundings is established through the circulation design, mediation of words, texts and signs (Augé, 1995; Fuller, 2002; Adey, 2007). Airport signage and automated voice instructions, next to spatial organisation and retail space, become an interface for interaction between passengers and airport operators. As a result, the air travel experience consists of instructions for use, prescriptive, prohibitive or informative, in the form of codified ideograms, or natural written and spoken language. Modern airports offer instructions for movement without the sound of a "live" human voice: this has been replaced by a computer-generated voice. For example, at Schiphol Airport a female computer voice repeatedly says "mind your step" to warn passengers who step out of a moving escalator and at the gates passengers follow animated pictogram instructions for security checks.

Today’s experience of airport flow does not match the vision presented in the 1958 study for Washington International Airport. In the film stills resulting from this study, architects and engineers
emphasized that airport hospitality and design were crucial to avoid the passenger experience of boredom, fatigue and inconvenience resulting from the logic of the pier system. They proposed a new concept, replacing piers by removing aircraft from the terminal and grouping them around special service blocks. Some part of the building – or passenger-containing element – would be so constructed that it could detach itself and move to this aircraft block. This proposal focused on air travel experience from the passenger perspective and sought to eliminate long walks between departure lounge and plane. Moreover, these designers foresaw that early arriving passengers could then spend time and money in the concessions area right up to the last minute. They would sit in a spacious (mobile) departure lounge – or even observation deck – isolated from fumes and noise while it approached the plane. In this way, every passenger might again enjoy an exhilarating air travel experience in comfort.

In contrast, contemporary airports are oversized and overcrowded. Passengers are faced with the discomfort of waiting, and their anonymous passage is determined by the mathematical parameters of arrival and departure times. Moreover, growing issues of security hamper the efficiency and speed of airport flow. These issues probably most concern people of colour, people with Arabic last names and as well, passengers who travel for work on a regular basis.
**Tension and Annoyance at Airport Global Thresholds**

**(Automated Security and Control of Flow)**

In the period between 1961 and 1970 there was a series of plane hijackings. For this reason, aviation security became a serious issue for airport authorities. All passengers had to undergo inspection by armed guards, be screened by metal detectors, and submit their carry-on baggage to X-ray inspection before entering the plane. In 1988, a bomb concealed in a cassette player on a Pan Am 103 flight from Heathrow to JFK killed all the passengers and residents of the village below. After this incident airports introduced obligatory X-ray scanning for all luggage. After the 9/11 attacks in 2001, new security regulations slowed down passenger flow drastically. On that occasion airplanes had become weapons rather than bargaining tools. In the aftermath, security turned into a reactionary control system with a growing list of precautions (e.g. obligatory shoe X-ray screening, random baggage checks, banning of liquid and aerosols from hand luggage, new pat down procedures, biometric passports, controlled list-matching for all passengers).


**Fig. 40.** The images on body scanner displays were intensively discussed by the media on grounds of privacy. The image on the right shows the scanning capability of small dosage digital radiographic systems. (Source: http://adani.by/print/en/news-and-events/in-the-news/whole-body-scanner-that-can-reveal-syringe-bombs.html?showlogin=1)

By 2010, almost all U.S. airports had installed new scanning equipment (advanced matching imaging technology units) to screen passengers for metallic and non-metallic threats. This technology promised to detect "weapons, explosives and other objects concealed under layers of clothing without physical contact with passengers"[19](http://www.tsa.gov/ait-how-it-works). Although technology aimed to improve passenger safety, new security precautions caused longer air travel procedure times and

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[19] Privacy concerns caused major criticism of this technology. Travellers are still permitted to opt out of the scan, but are then subjected to an aggressive pat-down procedure. [http://www.wired.com/2013/01/tsa-abandons-nude-scanners/?cid=5396554](http://www.wired.com/2013/01/tsa-abandons-nude-scanners/?cid=5396554)
tension for all passengers, as well as security guards. But instead of improving, things were getting worse. Security thresholds were continuously expanding to house new equipment and additional queuing lines to accelerate control procedures. This expansion caused an increasing demand for airport space, endless queuing, fear, irritation and even longer walks for passengers.

![Image has been removed due to Copyright restrictions]

**Fig. 41.** The passenger experience of security – a complex system of X-ray machines, metal detector portals, body scanners and security guards. (Source: http://cdn.farecompare.com/resources/fcblogs/2011/05/airport-body-scan-security-checkpoint.jpg)

However, new spatial solutions were also being developed for better reliability, flexibility and passenger comfort at security thresholds. For example, at Zurich Airport centralized security checks have now been placed in a separate building between the terminals and airside centre. Four security check levels simplify the routes taken by departing passengers and allow full operational flexibility to regulate the flow (additional levels operate at peak times).
Control of national borders has also become a major issue in managing the speed of flow on a global scale. In order to guarantee the highest possible degree of security and accelerate passage through national borders, airports have introduced the latest biometric technology for automated border control. This has required the creation and coupling of various passenger information systems (e.g. USPASS, Dedicated Commuter Line, Secure Electronic Network for Travellers Rapid Inspection in the U.S. or PRIVUM at Amsterdam Schiphol). New interfaces – automated border checkpoints – were offered to pre-approved passenger who registered for faster flow through border thresholds. (Fuller 2003) This pre-approved passenger program required the submission of biometric data (e.g. iris scanning, fingerprints, face recognition) into these databanks. Later, biometric passes became obligatory for all who wanted to travel to the U.S. As Canadian sociologist, David Lyon has suggested, “incredibly huge databases with biometrics of billions of people will become instruments of surveillance and control to governments around the world in the next decade (Lyon, 2007:191).
Fig. 43. Different interfaces for check-in (top) and border crossing (bottom): economy, HON/first class and automated borders, Frankfurt International Airport. (Source: Codourey 2005)

Where they are installed and used, automated border controls have, then, replaced face-to-face (F2F) interaction between controllers and controlled. This surveillance technology is based on biometrics at it allowed fast and convenient self-service border checks and granted entitled travellers freedom of movement. As a result, passengers moved through border controls at different speeds. Economy class travellers had to submit to longer border control procedures than highly mobile (and affluent) business and first-class travellers who could bypass normal immigration arrangements. As shown, the complexity of the procedure for controlling passengers is rapidly increasing. Today, departure means going through check-in, security control of luggage, body and boarding card as well as border and customs checks where necessary. In some cases, border and security controls may even be repeated before entering the plane. Therefore, airport design mainly focuses on management of the flow of passengers going through thresholds (check-in/ticketing, security and border control). Passenger needs for emotional comfort are not considered. Also, the exhausted body of the passenger cannot cope with the increasing demands being placed upon it in the airport.

For the aviation industry, the volume and efficiency of passenger flow determine the position of the airport in the global aviation ranking. The passenger experience, at its theoretically smoothest and fastest, can reduce to interaction with the interfaces of an electronic surveillance system.
Fig. 44. Diagram of airport flow-space, check-in, ticketing, border and security thresholds at Frankfurt International Airport, Codourey (2005)

Designing the Airport Experience for Privileged Passengers

Quite apart from the speed of passing through airport thresholds, the overall air travel experience is by no means uniform for all passengers. Airports are markedly hierarchical spaces, where passengers are literally divided into classes. The Spanish sociologist Manuel Castells views the airport as a "space of flows" (Castells, 2000:20) that is far from being either mixed or open. He writes that for the global elite:

> There is a construction of a (relatively) secluded space across the world along the connecting lines of the space of flows; international hotels whose decoration, from the design of the room to the colour of towels, is similar all over the world to create sense of familiarity with inner world [sic], while including abstraction from surrounding world (Castells, 2006: 225)

British geographer Stephen Graham sees passenger airports and fast intercity railway stations as one of the four emerging premium network spaces in the contemporary metropolis and in this context criticizes airport design and regulation for focusing only on the needs of affluent business and leisure travellers – Sloterdijk’s "kinetic elites."

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20 Stephen Graham defines four emerging premium network spaces. These are e-commerce, export zones, multi-modal logistics enclaves dedicated to freight, and passenger airports and fast rail stations.

21 The term was coined by German philosopher Peter Sloterdijk, and borrowed by architect Rem Koolhaas.
A separate airline lounge and fast security and check-in lanes for business and first class passengers express these enclaves of global logistic elitism. At Frankfurt International Airport, for example, different legal orders and strategies create separate territories that are only accessible to selected groups of travellers: frequent traveller lounges, a separate terminal first class passengers, and at the other end of the scale, a detention camp for so-called enforced cosmopolitans – asylum seekers and other refugees who arrive by plane but are not allowed to enter national territory – as well as an extra low-cost airport called Frankfurt-Hahn, located some 125 km away from Frankfurt Airport proper, and converted in the early 1990s from a U.S. military air base for use by price-conscious tourists and business travellers.

The planes themselves continued these structures of privilege with greater leg and arm room, recliners with sliding footrests, wider aisles, fewer fellow passengers, quicker boarding and disembarking, more storage space, more hand luggage, closer bathrooms, first choice of business publications, friendlier service and better food served on glass dishes. As American sociologist Mark Gottdiener noticed, even the supply of oxygen on an airplane is determined by passenger status (Gottdiener, 2000:121).

Airlines even offered door-to-door air travel for their preferred customers. In an interview, a Lufthansa employee explained that these 20% first-class passengers bring the airlines 80% of their profits. These profits justify Lufthansa’s special hospitality and luxurious offers. Virgin Airlines also

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22 In the 1990s economy-class passengers who travelled more frequently were allowed entry to the first-class lounge as a so-called frequent flyer “upgrade”. This caused concern and annoyance among first-class passengers who felt invaded by the less well dressed or well-behaved. Therefore, many airlines responded by introducing “business class” as an intermediate class. (Rosler, 1998:47)
presents its vision of luxury air travel to their "upper class" passengers with the advertising slogan: "Pure luxury. Always. When it comes to making your flight just perfect, we reckon we’ve thought of everything. Prepare to be spoilt rotten." (Source: http://www.virgin-atlantic.com/us/en/the-virgin-experience/upperclass.html)

To prove their claim, Virgin Airlines offer a chauffeur-driven car service at the passenger’s doorstep, laid back check-in, private security lane, luxurious clubhouses with spa and other services, priority boarding, dining experience, on-board bar, state-of-the-art entertainment and communication systems, and fully flat beds for complete relaxation during the flight. As true hospitality means face-to-face assistance, Virgin Airlines have been using the glamour of the Google Glass and other wearable technology (e.g. smart watches) to give a feeling of the highest level of personalized service (pilot project at Heathrow) in the airline’s upper class wing. In pursuit of the ultimate customer experience, Virgin Airlines intends to further develop the use of this technology on the basis of feedback from customers and staff.

Another featured attraction for privileged passengers is the new upper deck cabin on newly redesigned Airbus A380 aircraft for Etihad Airways. Passengers who can afford luxury can choose between a
"Residence" (suite with living room, separate double bedroom, en-suite shower and access to a butler, in case flight attendant service is not sufficient), a "First Apartment" (suite with reclining lounge seats, full-length bed, minibar, personal vanity unit and wardrobe) or "First Suite" (a large seat and ottoman, which converts into a six foot eight-and-a-half inch full-flat bed) (Clark 2014). According to Etihad these new luxury cabins designed by Etihad Design Consortium (EDC) reflected customer feedback. For these privileged passengers, EDC designers provided 20 per cent more personal space than current business class in what they call "Business Studios."

At the other end of the spectrum, to optimize profits, airlines are looking at seat design solutions that increase airplane capacity by reducing legroom in the economy class even further. Some examples are Skyrider, the first stand-up airline seat (2010) and the Airbus saddle seat (2014), however these seats are still not in use. I would be surprised if they improve the comfort of the air travel experience, even for short flights.
A more all-round approach has been taken by Air New Zealand, who commissioned global design consultancy IDEO to design cabin layout and furnishings for long-haul flights with a human-centred approach. The results are more generous for passengers in all classes than the EDC consortium designs for Etihad. IDEO focused on the entire flight experience rather than luxurious cabin design. They proposed new cabin layout for the economy and business classes, and a new concept for in-flight service and entertainment. In particular, new seat layout enables passengers to choose socialization or solitude, options that were previously available only to first-class passengers. This includes passengers, who can afford to pay for three seats in economy class and can adjust their space and interactions on the plane according to their demands and enjoy their journey.

2.2 How do Airports Manipulate Passengers’ Emotions?

Airports have developed different design and marketing strategies to combat passengers’ negative emotions (e.g. fear, irritation, boredom, fatigue) on the one hand, and on the other to encourage them to spend money while they wait. In fact, airports have realized that there is a correlation between
passenger satisfaction and increased spending, so their focus on "passenger experience" is also out of self-interest. In this respect fast, trouble-free security controls are directly connected with the duty-free shopping malls, coffee shops and other non-aviation-related activities.

**TSA Checkpoint Evolution – How Does a Human-centred Design Approach Reduce Stress at Security Checkpoints?**

Security checks evolved through a reactive process of extending precautions and screening technologies ever further until they became alienating and dehumanizing experiences. Stress and tension reach a real breaking point at the security checkpoints, and passengers become frustrated and intolerant of increasing security hassle. But the people who control them are also under a lot of pressure. Calming emotions became an important issue (Fuller, 2003; Fuller & Harley, 2004; Adey, 2010), and hence design task, addressing the discontent of both passengers and security staff.

In 2006, the U.S. Transportation Security Administration (TSA) recognized this need and asked the global design and innovation consultancy IDEO (http://ideo.com), to help them create a better checkpoint experience for passengers and security officers (TSOs). IDEO took a human-centred design approach to this problem. At first, designers needed to develop empathy for passengers and TSOs, and they went through TSO training. After the course, they worked at checkpoints to test different attitudes to controlling people. They also sought to learn from different environments with the similar task of dealing with an incoming flow of people (e.g. Disneyland, emergency surgeries). They then used iterative prototyping methods to build 1:1 foam core prototypes to try out different flows and interactions with stakeholders. Through this research they learned that different passenger archetypes conflicted with other passengers as well as with TSOs. They identified four kinds of passenger: the "speedster", who travels all the time and knows exactly how to get through security, the "stumbler", who forgets to do things properly, the "challenger", who wants to know why they have to go through all these security checks, and the "dignitarian", who just wants a little privacy and dignity. These travellers tended to work against each other, because they had different priorities. The challenge was to find design solutions that enabled people to work together. Another finding was that TSOs view passengers as potential security threats and passengers sense this attitude towards them. This situation creates friction. Finally, the goal of the project was to enable better collaboration between passengers and TSOs. Therefore, IDEO designers created a strategy of what they called "Calm Confidence", to ease tension at the checkpoint and to allow a shift to proactive security and engage passengers as allies. This design approach would allow TSOs to focus on security issues rather than on instructing passengers.\(^\text{23}\)

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\(^{23}\) TSA have continued dialogue with passengers through their blog. For further information see:
Walk through TSA Checkpoint at BWI (Baltimore Airport), 2008-https://www.youtube.com/watch?v=nPujbxF_2mw
The five principles of IDEO’s "Calm Confidence" strategy were:

- **An intuitive system spread out in space and time to relieve checkpoint pressure.**
  They integrated the waiting lines visually with X-ray photographs of objects celebrating the image technology in a decorative and fun way, and added light walls with changing colour spectrum and a soundtrack that dampened anxiety.

- **A “Prep Stop” for passengers to help them prepare their belongings before going through control.**
  They also designed podiums for TSOs to ground them precisely and define the security checkpoint. These design interventions improved face-to-face interaction between TSOs and passengers.

- **To improve interaction between stakeholders.**
  To build a relationship of empathy and understanding, IDEO designers introduced “sequential stories” to passengers waiting in line, presenting different portraits and small bios of the TSOs working at each checkpoint.

- **To respond quickly.**
  This brought a shift from reactive to proactive security, emphasizing critical thinking and intuition. IDEO trained TSOs to respond dynamically and actively in this environment rather than just follow standard operating procedures (SOP).

- **To experiment, learn, evolve and to stay ahead of security threats by fostering a culture of prototyping and continuous improvement.**
During development of this project, designers learned that it was impossible to design one type of checkpoint look for all airports. It had to be an evolving experience – rolling out relevant parts of this system to each different airport. As a result, they developed another way of enabling passengers to choose the degree of assistance they needed at checkpoints: the "What is Your Lane" system.  

Fig. 52. The Transportation Security Administration (TSA) separate airport security lanes for three different kinds of traveller, 2008 (Source: http://cityroomblogs.nytimes.com/2008/06/03/would-newfangled-airport-security-work-in-new-york/?_php=true&_type=blogs&_r=0)

The human-centred design approach used in this project illustrates that design can address complex, seemingly intractable problems when passengers are in focus and a holistic approach is applied. The

The U.S. Transportation Security Administration introduced a new self-qualification system to alleviate the unpredictability and frustration associated with long airport security queues. This system relies on passengers to sort themselves into three groups (families and special assistance, casual travellers, expert travellers). Each is assigned a colour and shape. By giving travellers the choice which lane they would feel most comfortable in, TSA gave control of the experience back to the passenger and provided a little more comfort for anxious passengers.

TSA Checkpoint Evolution Project: 2 years / 70 designers / over 300 users participating in design process in observations, walking through prototypes and giving feedback / ended up training over 50,000 TSOs (country wide training program). Gretchen Wustrack, IDEO design and innovation consultancy. (Source: http://fora.tv/2011/10/20/Think_Art_Act_Science_Global_Mobility)
TSA checkpoint design approach shows that the solution to the complex problems of airport flow cannot be seen in purely architectural terms. A focus on understanding passengers and their interactions in the system is equally important. Therefore, understanding and meeting the needs and wishes of air travellers through design rather than mere technology may improve the airport experience. In this context some airports introduced hologram guards to explain liquid restrictions and remind passengers to have boarding cards ready. However, these avatars seem counter-productive, as interaction with them is uncanny and further dehumanizes the flow experience.  

![Image](image_removed)

*Fig. 53. Manchester International Airport was the first airport to introduce holographic guards to reduce the workload of security staff (2011). (Video: [http://www.bbc.co.uk/news/uk-england-manchester-12310095](http://www.bbc.co.uk/news/uk-england-manchester-12310095))*

Although no design can replace the embarrassing impact of body scanners (various restrictions imposed by law and regulations inevitably conflict with passengers’ goals) IDEO’s design approach shows that it is possible to reduce stress and improve interaction between passengers and staff. Their achievement is to have developed small design interventions (e.g. prep point, bench) that improved passenger comfort. By creating a curriculum for use by TSA managers when training security officers in the organization’s new people-centred approach, they also helped change the TSA focus from object and technology to behaviour.

**How do Marketing Research and Advertising Strategies Create an Illusion of Saving by Shopping to Kill the Boredom of Waiting for Departure?**

The combination of airport and shopping provided not only non-aviation airport revenues but also triggered a paradigm shift from fast and efficient processing to the dwelling of passengers in the airport. In 1947, the first duty free shop was established at Ireland’s Shannon Airport to provide a service to trans-Atlantic airline passengers whose flights stopped there for refuelling. This successful airside concept was then applied at almost every airport worldwide and airport authorities soon discovered a correlation between time spent in the airport, the illusion of saving money, and the

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26 2012 – Avatar responding video, [http://nypost.com/2012/05/22/airport-avatar-landing/](http://nypost.com/2012/05/22/airport-avatar-landing/)

27 Duty-free shops (or stores) are retail outlets that are exempt from the payment of certain local or national taxes and duties, on the requirement that the goods sold will be sold to travellers who will take them out of the country.
willingness of passengers to spend while waiting for a flight. So even more shops were added to the airport, now on the landside, and airports, previously defined by clarity and flow efficiency, gradually turned into extended shopping malls (appropriately called air malls). These are the major source of airport revenue today.  

The British-American photographer Sze Tsung Leong describes the airport as a labyrinth that

Works by slowing down passengers, dragging them in the most circuitous manner past shop frontages, and coercing them into making airport shopping the highest-yielding sales per square foot of any shopping type. Airport shopping enjoys something approaching a perfect commercial state because airport authorities use the desirable effects brought on by the excitement of travel, the confusion of exchange rates, the susceptibility of jetlagged passengers, and the wish to make the trip "worth it" (Leong in Koolhaas 2000:175).

For top profits, positioning of the retail outlet is carefully planned in accordance with psychographic studies (profitability vs. space allocation). Today, duty-free shopping is an integrated part of the flow, located immediately after the security checks, when passengers are relieved and relaxed after passing through the stressful procedure of control and scanning.

28 In the 1990s retail accounted for 30% of airport revenue. By 2008 it had increased to 50% and at larger airports was as high as 60%. Over the past decade, “on a per-passenger basis we have seen sales grow by as much as 25% to 50%,” (Source: http://www.forbes.com/2008/06/02/aviation-airlines-retail-biz-logistics-cx_af_0603aviation08_delays.html) Moreover, according to the Airport Revenue News 2007 Fact Book, the average passenger boarding a plane at Pittsburgh spent $13, far above the national average of $7.85 in comparable circumstances.
Another example of conscious emotional manipulation is Switzerland’s first-ever arrivals duty-free shop that opened in 2011. The Nuance Group (one of the world’s leading travel retailers) extended the duty-free shopping experience to arriving travellers and integrated a large shopping area into the flow.
Passengers had to go through the well lit and colourful store with carefully displayed luxurious brands of perfume & cosmetics, alcohol and tobacco before picking up their luggage from the belts in the adjacent, rather dusty baggage collection area.

Airport retailers have detailed information about passenger shopping habits based on airport traffic flow of data, boarding card details of duty-free purchasers, and behavioural patterns recorded on video surveillance devices. By studying the spending habits of foreign travellers, they can customize their offers according to incoming flights and passengers (e.g. quick-change window displays, shops specially designed for particular groups of travellers). The process of adaptation, covering price (high-end, mid-end), brand, and product (colour, size, etc.), has recently intensified still further, with many airports introducing well-known mid-end brands in the fashion & accessories category to meet demand from EU leisure passengers (Arthur D. Little 2009). For example, the summer shopping campaign at Zurich Airport remodelled the shopping mall as a “Summer Beach Club” to get holiday tourists into a summer shopping mood immediately after security checks, seducing passengers with the promise:

You'll find everything you need to look great on your holiday in the heart of the Airside Centre [...] Before your flight, pull up a comfy safari bar stool in the Airport Beach Club and order a zesty summer cocktail, a classic long drink, a cool beer, a delicious smoothie, a fresh fruit juice or a smooth, rich coffee from the bartender while you nibble on some crunchy fresh snacks. (http://www.zurich-airport.com/the-company/media/news-center/2014/jun/zrh-2014-06-25-feriendestination)
How do Architects Convert the Passenger Experience of Air Travel Into Fun and Enjoyment?

Since 2011, airport owners, operators and developers worldwide have realized that the link between passenger satisfaction and profitability applies to the overall passenger experience at the airport. Air travellers want to spend time and money on enjoyable activities (e.g. wellness and spa, golf) not just luxurious retail and cuisine. Therefore, to stay attractive, airports have been looking for opportunities to create memorable experiences and forge positive relationship with their customers. The term "passenger experience" has become central to many aviation industry conferences (e.g. Passenger Terminal Expo & Conference, Future Travel Experience, IATA World Passenger Symposium).

Moreover, airlines have shown an increasing interest in passengers’ air-travel related emotions. For example, British Airways claim to have refined their on-board experience by adding improvements that have a positive effect on passengers’ minds as well as their bodies. They have created a so-called "happiness blanket" (a neuro-blanket tracking the passenger’s emotions) to determine the actual physical and mental effects of the on-board experience. This may, however, be no more than an innovative marketing strategy, in the wake of which the airline claims that "a study identified seven different emotions when passengers fly: enjoyment, conviviality, belonging, security, control, empowerment and vitality."

(Source: http://www.britishairways.com/assets/pdfs/mediacentre/2014/20140305164244.pdf)
Here the aviation industry is still focusing on product and technology-based solutions to optimize profits, rather than on the passenger’s perspective. In contrast, recent airport plans go beyond technology – and even beyond the purely aesthetic and functional – towards solutions that elevate the all-round passenger experience. In most cases, however, these remain predominantly airport-centred designs guided by the architect’s intuition. A good example is Terminal 3 at Singapore’s Changi Airport (2007) designed by CPG Corporation, Skidmore, Owings and Merill (roof construction regulating natural light), with interior design by Woodhead. The goal of the project was to create a memorable airport experience by reinforcing user-friendliness (intuitive layout system for easy wayfinding, natural lighting, external views) and amenities (e.g. hotel, cinema, wellness). Nevertheless, in at least one respect the Singapore architects transcended the air-travel focus to capture a specifically Singaporean sense of place by featuring a "Green Wall" (5-storey high, 300 m long) across the building and planting landscaped gardens with various themes where passengers could sit back and relax, admiring a cactus garden, enjoying interactive experience in an enchanted garden, strolling through an orchid garden with a koi pond, observing aircraft from the rooftop sunflower garden, or even gaining insights into the lifecycle of a butterfly in the butterfly garden.
In 2011 the global design and architecture firm Gensler created a comprehensive survey tool to measure airport terminal performance and passenger satisfaction in connection with terminal design (Hooper, Thompson at al., 2011 http://www.gensler.com/design-thinking/research/aviation-performance-index). The preliminary results suggested a relationship between terminal design and passenger satisfaction, especially in respect to wayfinding and efficiency (quick check-in, friction-free security checkpoints, rapid baggage claim and customs, easy access to the terminal). But also, the quality of the physical environment at the airport terminal (e.g. comfort, light, air quality, restrooms) was important to passengers.

The re-design of San Francisco’s Terminal 2 (2011) is an example of innovative airport terminal design. In this project, Gensler’s architects (http://www.gensler.com) applied design strategies that reduce travellers’ stress, highlight the airport’s art installations and promote sustainability. They elevated passenger experience and the romance of travel by emphasizing service, hospitality and comfort.

According to Gensler (website and PR material) design strategy for “De-Stressing in a Pat-down World” featured:

- A "recompose" area just after security with natural light and hanging installation by New York artist Janet Echelman. (This area serves passengers as place to re-dress and gather their belongings).
- Hydration stations offer passengers the possibility to refill their water containers with spring water as an ecological alternative to commercial bottle water.
• A "club feel" character to the departure lounge that permits passengers to choose how they spend their waiting time: eating, drinking, playing, working or relaxing (local organic dining, shopping, area with a variety of seating options, art installations and two children’s play areas).
• "Sit or work" gate lounges with work-oriented seating featuring power outlets, dining seating, and seating clusters to accommodate small and large groups, elevated work counters, laptop plug-in stations, free Wi-Fi, etc.).
• Arrival lounges designed as warm, welcoming places.
• Natural daylight for better terminal navigation, a healthy travel environment and saving electricity.

Gensler’s design showed that non-commercial activities are important factors for increasing passenger satisfaction and providing a memorable air travel experience, because they offer passengers attractive alternatives for spending time in the airport. Although the architects could not eliminate the hassle of security controls, they looked for solutions to humanize the passenger experience by creating a comfortable environment with places to relax, good air circulation and daylight.29 American architect

29 This award winning, project by Gensler became the benchmark for the industry. SFO T2 also addresses issues of sustainability, supports SFO’s goals of zero waste and promotes awareness of the carbon footprint. Video “A Day in the Airport” illustrates the SFO T2 passenger experience. http://www.gensleron.com/cities/2011/9/21/architecture-storytelling-film.
and founder of Gensler, Arthur Gensler claims in the interview that San Francisco T2 is an “Airport built for people [...] not planes” (Arthur Gensler, video Recycling Airport Terminal: How we made SFO T2 (Leach 2011)). Terminal 2 at Seoul Incheon’s Airport, also planned by Gensler, moves towards a blend of the San Francisco and Singaporean models, with indoor gardens integrated into a shopping area, and a stage for live performances. Gensler architects describe the future terminal as designed to

> Look airborne and feel like a terrarium with lots of glass, sunlight, tropical plants and curiosities that make people happy. Among them and all inside the terminal: two central parks, a babbling brook, native gardens, aviary and lots of butterflies. (Hooper, 2012)

Gensler predicts that the airport of the near future will improve the passenger experience by incorporating mobile and wireless technology and creating a customized journey through its various stages (with more emphasis on arrivals). In this way, design innovation will boost non-aviation revenue still further and help airports to gain a competitive advantage while increasing the quality of customer service. Real-time tracking of baggage, smart phone apps to identify the location of passenger bags and self-boarding technology will transform the departure experience and waiting "with geo-fencing software that enables the business to target customers with messages based on their proximity to suggest things to do." (Bernstein, 2013)
The question remains: how can these mobile and wireless technologies transform the physical environment of the airport? Will geo-fencing software address the needs of passengers or just manipulate them to spend more money?

Design elements such as "recompose zones", comfortable seating with a variety of options, natural lighting, external views, hydration stations, green walls etc. are unrelated to commerce and stand for a democratic approach (good design and experience for all passengers) conveying a sense of well-being and a memorable passenger experience. These designs focus on the general needs of all air travellers rather than purely (or predominantly) on those of the business traveller. But, it seems that airport owners and designers are reinventing the airport as a place where people will want to spend time on shopping and indulging themselves. The "transit" airport has become the destination airport: "a fun place to be in" (Hooper 2013). But do all passengers really want to spend time on shopping and indulging themselves? For constant travellers, for example, the airport is a (distributed) workplace rather than fun place to be in!

The following section will show how technological trends support the airport’s interest in extending the time passengers spend there, and their goal of creating a “my airport” passenger experience.

2.3 How do Airports Personalize the Passenger Experience in Hybrid Space?

Surveillance Technology

Electronic surveillance strategies became a central feature of the passenger experience in airport flow. David Lyon points out that “airports are perhaps the most surveilled sites in terms of the means of movement and identification. And they are as well places for social sorting” (Lyon, 2007:123). Surveillance in airports includes airplanes, airport machines, baggage, people, personal data, and physical documents. Innumerable expert systems (problem-solving computer software) are currently applied for the purpose of management and simulation of various movements in every airport. These systems are used to control take-off and landing, ticketing and reservations, baggage handling, schedules, cleaning, weather forecasting, in-flight catering, security, multiple employment patterns, baggage X-ray, waste management, environmental impact and so on. IT can also track strange behaviour or employ thermal imaging to detect disease, a reality that passengers are often unaware of. All these methods of surveillance are encrypted. British human geographers Martin Dodge and Rob Kitchin posit that airports are a hybrid space constituted by people, codes and structures, and the human space structured by pervasive, consistent, and routine code is what these authors call the “real virtuality of air travel” (Dodge & Kitchin 2011). Without codes this space would collapse.

30 Australian computer scientist Roger Clarke distinguishes between physical surveillance (face to face) as the basic form and electronic surveillance (interface) as the augmentation of physical surveillance. Clarke points out that today’s systematic use of personal data systems in the investigation and monitoring of peoples’ actions or communications gives rise to an additional form of surveillance called “dataveillance” (derived from “data surveillance”).

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The physical experience of travel has, in fact, become inseparable from the software used first to model and then to design it. The architect designing an airport must model both airside and landside flows. These are optimized using a computer program called Critical Path Analysis (CPA). Animated models of generic passengers with no identifying marks or PAX are used in 3D modelling programs to envision the mobility of passengers in the airport area (Cresswell, 2006). Using data provided by mobile and wireless technologies, CPA is dramatically changing design approaches to the hybrid flow-space. For example, the world's leading specialist in air transportation ICT (SITA) is developing new solutions for passenger flow monitoring with situational awareness, based on real-time data and predictive analytics. SITA argues that end-to-end passenger flow monitoring plays an essential part in making airport environments smarter and location-aware. They argue that the "intelligent airport", with real-time data and predictive analytics, will promote proactive decision-making (e.g. for employing more resources to decrease passenger waiting time at security checkpoints, time for offloading bags etc.). SITA claims that it is "turning passenger movement into information that generates tangible results – improvements in customer satisfaction, productivity, new revenue streams – and reduces operational costs" (SITA, 2013). Perhaps, the "intelligent airport" concept will increase airport revenues and productivity, but it will also intensify surveillance, tracking and profiling of passengers for security and commercial purpose.

Fig. 63. SITA’s passenger flow monitoring capabilities diagram indicates eight points of the passenger’s journey where airports can capture data. (Source: http://www.sita.aero/sectors/airports/intelligent-airport/passenger-flow-monitoring/)

31 The term “landside” means the sovereign territory of the country. Passengers enter a “clean zone” after boarding and security procedures. Airside is the extraterritorial space of the country, exempt from national law, where passengers have either officially left or not yet entered the country; they are still in transit space.
Moreover, SITA is convinced that these wireless technologies will reduce waiting time at security and increase operational efficiency (barcoded boarding pass, passenger tracking system). These technologies will give airports valuable information about passengers’ locations, check-in times, dwell times and buying habits. This will help increase non-aviation revenues (Wi-Fi device tracking system) by monitoring travellers and reporting up-to-date retail and flight information based on their exact location. It will also enhance passenger experience (Bluetooth device tracking system) by measuring and displaying predicted passenger queuing in real time and detecting alarm overflow situations at various checkpoints. Wireless technology can also provide a cost-efficient queue management system for security and border controls. SITA’s claim is a one-sided and technology-driven approach to solving congestion of passenger flow. SITA does not take into considerations the effects of such electronic surveillance of people. British human geographer Peter Adey warned about the sorting capabilities of airport monitoring upon. He wrote:

The airport has twisted this arrangement so that the practices used to defend against ‘terror’ have been combined with those used, not to distribute global wealth, but to absorb and retrieve it. This relationship resonates, of course, with practices such as passenger profiling, techniques, which Adam Arvidson has shown may owe their origin to commercial marketing procedures (Salter, 2008:156)

Amadeus, another technology partner of the global air travel industry, conducted a passenger survey and produced a report entitled "Navigating the Airport of Tomorrow" (Amadeus, 2011). Based on
survey results, Amadeus believes that the vision of the "always connected passenger" will improve the passenger experience. Moreover, monitoring of passenger flow may "help shrink security queues and get your passengers to their gates quicker, allowing more dwell time and increasing retail sales" because "an extra 10 minutes in security reduces the average passenger’s retail spend by 30%". (http://www.amadeus.com/airlineit/navigating-the-airport-of-tomorrow/index.html).

The PR language of Amadeus actually reveals the motivation for investing in mobile and wireless technology in the airport. The actual desire is to constantly track passengers in order to reduce time at the security checkpoint for the benefit of more time for passengers to spend money while "killing the time" before boarding on the plane.

Fig. 65. *Navigating the Airport of Tomorrow – Amadeus.*

The PR language of Amadeus actually reveals the motivation for investing in mobile and wireless technology in the airport. The actual desire is to constantly track passengers in order to reduce time at the security checkpoint for the benefit of more time for passengers to spend money while "killing the time" before boarding on the plane.
However, these solutions may improve flow through thresholds and make the travel experience to that extent more personalized and seamless, as an overall travel solution they are still too general. Giving up privacy is problematic and does not necessarily mean collaboration with stakeholders. Personalizing travel for the convenience of longer shopping and self-indulgence may well make constant travellers even more alienated, continuously connected with technological interfaces without social interaction.

**How Does the Emergence of a New Kind of Space for Global Mobility Influences Academic Perceptions of the Airport?**

The complexity of airport infrastructure and services has also drawn the attention of many academics and artists who fly for work purposes (e.g. conferences, exhibitions, lectures and presentation). They interpret this emerging kind of space with its transitory character and meaning in the language of academic research or artistic insight. In result, an academic discourse has emerged around airports that speak of it as a new kind of space, and as integral part of mobility studies.

Thus in the early 1990s, the French anthropologist Marc Augé argued that airports, like other transitory spaces, are "placeless places" – the very opposite of authentic, rooted and bounded places that are both historical and concerned with identity. Anthropological place is, for him

> A place [...] occupied by the indigenous inhabitants who live in it, cultivate it, defend it, mark its strong points and keep its frontiers under surveillance, but who also detect in it the traces of chthonian or celestial powers, ancestors or spirits which populate and animate its private geography. (Augé, 1995:42)

For Augé airports, like other installations needed for the accelerated circulation of passengers and goods (high-speed roads and railways, interchanges), are just as much "non-places" as the means of transport themselves (Augé 1995:34). They are a new generic space similar to shopping malls, business hotels, service stations and supermarkets: they are just consumption spaces (Augé 1995:104). These are spaces where people can co-exist or cohabit without living together. In fact, they barely need to interact in order to negotiate their passage through air space. It is only logical, therefore, that airport aesthetics should be homogenized all over the world in order to enable airport passengers to find their way to gates seamlessly (e.g. signs, piers, gates, system typology).

Taking the concrete example of Schiphol, British human geographer Tim Cresswell critically develops the Augé argument further when he stated that: "Schiphol, like any other kind of place is situated and has its history and own sites of connections. [...] Its geographical location makes a difference to the experience of the mobilities that are produced there" (Cresswell, 2006:257). In fact, Schiphol Airport

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32 A democratic example of the application of wireless technology in the airport for a specific group of travellers is Beacons Sensors at SF Airport that could help blind travellers navigate within a terminal with the guidance of beacon technology. Tiny sensors called beacons will be tested in one of the airport's newest terminals and potentially expand to other terminals in the future. The initiative is expected to launch in fall, 2014 (Source: http://mashable.com/2014/07/31/san-francisco-airport-beacons/#:eyJzIjoiZiIsImkiOiJfZXRmZzFxM3E2ZmNpbmpidm16MWd3cV8ifQ)
recognized the importance of local history, culture and design for creating an imaginary of place, and re-designed part of the passageway between Piers E and F into what it called Holland Boulevard. There, millions of transit passengers can enjoy a pleasant stay, relax and enjoy Dutch art, culture and literature without actually entering the Netherlands. To create an ambience where passengers can feel at home, designers created living rooms with cozy spaces, featuring fireplaces, television sets and even a piano. There is even a Baby Care Lounge (sponsored by Dutch food purveyor Nutrica in 2007) where parents can care for their babies. The branded lounge has seven semi-transparent cubicles, each with a little bed, comfortable seating for the rest of the family, as well as changing tables, play areas and microwaves.

In addition, in the "Airport Library" (a global first) visitors can read Dutch books translated into 29 languages, watch short movies and listen to music. There, passengers can also download digital content to their personal devices via a download station and take a piece of Dutch culture onto their connecting flight.

Holland Boulevard offers also typical Dutch poffertjes (miniature pancakes), kibbeling (small chunks of fried buttered cod) and croquettes in its Dutch Kitchen, where travellers can sample Dutch coffee and beer in the Dutch Bar or even customize their own cocktail with a Dutch spirits brand via touchscreen in "Bols Genever Experience". Other Dutch things include Dutch design shop, Dutch
Airport Territory as Interface

flower stand, and outlet with Van Wely chocolates and even a branch of the state-licensed Holland Casino. In this way, Schiphol Airport has combined consumption space with local culture, providing a unique kind of airport transit experience. Although this project addresses various needs of transit passengers, the specific needs of travellers who need to work while in transit (instead of lounges) have not been addressed.

A third view is that of American sociologist Mark Gottdiener, who sees airports as a new kind of space providing realms of both place and placelessness. The best airport designs are not minimalist structures or "nowhere architecture", but distinct spaces that allow people to enjoy, relax, and interact within an environment that captures the imaginative realm of flight (Gottdiener, 2001: 61). Gottdiener argues that airports develop an urban culture, becoming multifunctional sites where a "pedestrian crowd creates a critical mass of social density, much like a busy downtown district of a larger city" (Gottdiener, 2001:21). These global hubs may, in yet another view, be "a contemporary substitute for the public square – a place where strangers come together and cross paths" (Sudjic in Cresswell, 2006:221). For example, constant travellers experience time spent in transit as part of their work and/or leisure time. In many cases, airports are even destinations for their meetings and conferences at strategic locations in the global order. For example, THE SQUAIRE at Frankfurt International Airport is connected business centre next to the airport terminal with covered access, ICE high-speed train and motorway access. This landmark building designed by JSK International Architects and Engineers provides some 145,000 square metres of office space, two Hilton Hotels, a business and conference centre, restaurants and infrastructure supporting the everyday needs of business people (shops, physicians, fitness centre, day care and various services).

Developers claim that this innovative use concept called the "new work city" creates a working environment in touch with global trends, focusing on knowledge workers (offices facilitating performance, motivation, creativity), networking (providing various areas for business contact), and time efficiency ("city under one roof" with airport at the doorstep).
Although it claims to create a working environment for knowledge workers, this project only partially covers the needs of the employees of Lufthansa, KPMG and Hilton (the key tenants of the new work city project) who work there every day, or of those who come there occasionally for conferences or meetings. It is not a workplace for constant travellers passing through transit space.

Subverting Augé’s thesis, some theorists (Lloyd, 2003; Urry, 2005) observe that airports share no characteristics with sedentary notions of place. They see the order of priorities as precisely contrary: cities are increasingly like airports because they share a global notion of space. The new work city / SQUAIRE project exemplifies this claim. What is more, to the British sociologist John Urry, airports are places of "dwelling mobility," sites of rest, activity, meetings and consumption, rather like many other (urban) sites across the world. Thus they are no longer the exception, but the rule; they are a "future urban form" (Fuller & Harley, 2005).

Today, travellers and workers from all over the world, as well as local residents, inhabit contemporary airports. As Ingeborg Flagge, director of the German Architecture Museum (DAM) suggests: airports are "transport hubs, department stores and market places" or even "a cities of special kind" (Flagge in Quadra, 2002:4). Mark Gottdiener, too, agrees that airports can now be compared to urban areas or
commercial cities. The newest regional developments have, in fact, transformed many airports into "Airport Cities" (Güller & Güller, 2003) or "Aviopolis" – so named by Australians media geographer Gillian Fuller and artist Ross Harley (see Chapter 1 above).

However, although airports can be seen as emerging new social spaces or even "future urban forms" (Fuller & Harley, 2005), their actual potential to become authentic and liveable urban spaces for mobile societies still needs to be investigated. This new type of space with non-place character requires, as Augé concluded, a deeper understanding: "The world of a super modernity does not exactly match the one in which we believe we live, for we live in a world that we have not yet learned to look at. We have to relearn to think about space." (Augé 1995:34). In agreement, Swiss-Brasilian geographer Francisco Klauser and his collaborators argue that

Airports cannot be reduced to non-places of consumption and mobility. They must also, more generally, be understood as complex and diverse, yet particularly commercialized, spaces in various forms of public use, which are not only in many ways treated like shopping malls but also as spaces for social encounters for various actors. (Klauser, Ruegg et.al, 2008:108)

**Summary for Chapter 2**

Airport experts distinguish two factors defining today’s airport hubs: aviation and non-aviation activities. The former concept comprises everything linked to the technical business of flying and security. The latter is reduced in the airport to consumption and profits. Airport design solutions are primarily technology-centred, with efficiency of flow focused on and graded by travellers’ status. The airport perspective on the "passenger experience" is with the general traveller in mind (PAX). The needs of constant travellers who fly for work are not considered.

As I have shown in this chapter, democratic design strategies will improve the comfort of air travel, and raise the quality of the transit environment. But architects and designers should also consider the airport space as a workplace for constant travellers, because travel for work purposes is continuously increasing. Moreover, airport design-challenges are not just about form or interface: they are a combination of both these factors and more. The TSA Checkpoint Evolution project by IDEO and SFO T2 by Gensler represent that well. Airport design has become a complex task that has to tackle the environment, communications, tools, and even service design. But the actual needs and desires of constant travellers must also be studied in detail.

The following chapter will discuss why travel for work-purposes has increased and how the workplace has evolved into mobile and hybrid space.
Chapter 3
Mobile Work in Hybrid Space

As argued by theorists (Harvey, 1989; Graham and Marvin, 1996; Castells, 1996; Urry, 2007; Virilio, 2008; Adey, 2010 et al) the world is becoming mobile and we are constantly on the move and globally connected via wireless technologies. This causes us to increasingly work in different spaces than in the past. Moreover, ways of working and interacting with others are changing, because we work in hybrid space. As a consequence, the traditional workplace is evolving into an agile, networked environment. For many passengers who work globally, the airport is now an extension in transit of their workplace. Insights into mobile lifestyle and user research can help to understand these changes, as well as the potential for design specifically for work in hybrid space.

In this chapter, I will review the emerging field of mobility studies (Bauman, 2000; Cresswell, 2006; Urry, 2007; Adey, 2010 et al.), as well as the discourse on aeromobility (Gottdiener, 2000; Kesserling, 2006; Cwerner at al. 2009, Faulconbridge, 2009), and discuss my own research approach into living in motion as case study 1. I will then examine past design approaches to the workplace and mobility. Finally, as case study 2, I will discuss how integration of assessment needs and user participation from early project stages can inform the design of the hybrid workplace.


Over the next decade, with digitisation, most of the facilities of the home and office will be carried around on the body or at least in a small bag, making those that can afford such objects geographically independent [...] Such people will be free to live where they want and travel as much as they want – they will be forced to consider whether they are settlers or really global nomads. (Makimoto & Manners, 1997)

The modern mobility paradigm is discussed in relevant sections of the emerging trans-disciplinary mobility studies in connection with the convergence of mobile technologies and Internet (Makimoto & Manners, 1997; Kluth, 2008; Turkle, 2008), as well as in the context of globalization (Sloterdijk, 1988; Rosler, 1999; Gottdiener, 2000; Bauman, 2005; Cresswell, 2006; Nowicka, 2006; Urry, 2000; 2007). Many names across many registers - i.e. academic, corporate, popular culture, are used to describe the privileged class of travellers on which this thesis focuses: "global nomads", "kinetic elite", "frequent business travellers", "frequent business flyers", "new business class", "mega travellers", "road warriors" or even "global players".

Artist Martha Rosler recognized frequent travellers as a type of transnational class. This transnational class consists of all those who fly frequently and connect with special program run by airlines to give travel credits for miles flown and win cost-free tickets.
According to British sociologist John Urry, twelve main global mobility forms are found in the world today. Besides the political and economic migration of asylum seekers, refugees and transnational migrant and military, he counts travelling tourists, visiting friends and relatives, students, au pairs, young people on their "overseas experience", domestic servants and workers. Urry suggests that other global mobility forms such as post-employment travel and medical travel to spas, hospitals, dentists, opticians and so on should also be considered, as well as business, professional and work-related travel, including commuting. All these forms of global mobility can overlap and impinge upon each other. They also depend upon passports and visa regulations, residence and labour qualifications, and refugee homeless, and migration status. The scale of this travelling is enormous, because these people are travelling further and faster and spend more time in the air. Therefore Urry speaks of

A ‘mobility turn’, a different way of thinking through the character of economic, social and political relationships. Such a turn is spreading in and through the social sciences, mobilizing analyses that have been historically static, fixed and concerned with predominantly spatial social structures. (Urry, 2007:6)

Furthermore, American sociologist Gottdiener has argued that air travel is no longer a temporary, "dead time in the air", but a resource that allows for a wide variety of activities. He has suggested that we could begin to speak of a "social life in air space as a separate dimension of living." The new business class of frequent fliers33 thus heralds the emergence of the next stage in economic development, the global economy. But business nomads are not a new concept, because people have always been on the move for business. For example, European merchants who travelled the spice routes to Asia. But, Gottdiener argues, these transformations, like any previous transformations of capitalism, bring with them a new way of everyday life (2000:85). Who, then, are these business nomads today?

Gottdiener explains that these road warriors cannot have much of an intimate social life, because they spend most of their time in planes and hotels. Not many have families, although that is hard to determine, because of a lack of information on this population, admits Gottdiener (2000: 86). What, then, do these new lifestyles look like, aside from the fact that these business travellers rely on air travel or even literally living in the air? Are these air travellers defined only by number of flights a year, frequent flyer status, and access to fancy lounges awarded by airlines according to money spent on tickets?

Miles earned and nights spent in hotels are very limited criteria that focus only on the global elites. I have observed that many business travellers do not always fly with the same airlines and therefore are not entitled to frequent traveller status. British sociologists Anthony Elliot and John Urry have likewise observed that these globals operate in the institutional context of fast-paced networking and a

33 These “frequent flyers” top a minimum level of 500,000 miles per year for frequent flyer status, or spend up to 330 nights per year in a hotel – 1993 Hilton record in Wayne, 1995 (Gottdiener, 2001:85).
highly mobile life, relatively unconstrained by nations, national societies or communities. They conclude that the "international, mobile realm of the twenty-first century was the first to generate a socio-economic elite that is global", which they call a global elite or superclass (Elliot & Urry, 2010:67). But they use this term, global elites, for people "travelling in transatlantic private jets to designer mansions dotted around the world." These jets not only indicate the super-wealth, but also the highly mobile nature of the globals themselves and their money, living extraordinary, sumptuous lifestyles well above even the highest standards of "locals" living in territorially fixed societies. (Elliot & Urry, 2010:67) And these globals employ a number of mobile life-strategies consisting of detached engagement, speed, networked possibilities, distance from the locality and the mapping of escape routes. They occupy luxurious and exclusive spaces (e.g. five-star hotel suites, private jets, private islands, penthouses or townhouses) where they feel at home (Elliot & Urry, 2010:82).

There is also evidence of "hypermobility" in the field of transportation studies. German and French economists Stefan Gössling and Ghislain Dubois (2009) report about hypermobile travellers who travel for leisure as well as business. These travellers are hypermobile in terms of participation in frequent trips, often over large distances. They originate from industrialized countries, China and India. Moreover, among them is a still smaller minority of highly mobile individuals who account for a large share of the overall kilometres travelled, especially by air.

According to Airbus report (Airbus, 2013), aviation is a rapidly growing sector, with passenger growth forecast of 4.9% in the coming 20 years. Airbus reports that there are two main reasons for this growth. First, cheaper flights allow greater ability for people to fly and contribute to, according to Airbus, the democratization of aviation. Second, there is a demand for larger aircraft not only to reduce fuel burn, and hence cost per seat, but also to meet growing demand: "If the number of seats offered by the world’s airlines is divided by frequency, it can be clearly seen that average aircraft seating is increasing." (Airbus, 2013) In consequence, we can observe real democratization of flight worldwide. This indicates that not only global elites are flying.

Affordability of air travel has, then, fundamently changed perceptions of distance, and as a consequence new lifestyles have emerged. But there is still little knowledge about hypermobile travellers, and statistics do not differentiate between leisure and work travel or travel motives at all. Therefore, Gössling and Ghislain concluded that there was a need for more thorough analysis of hypermobile travellers, because so far not many studies have been published in peer-reviewed journals (no statistical basis yet provided).

34 US airfares have dropped by 40% since the 1980s. In 1940 the price of a ticket LA-Hong Kong was equal to 1 year’s salary for the average American, now it is 1 week’s, and domestic round-trip prices fell from 1980-2012 by 43% (Airbus 2013).
Brazilian sociologist Saolo Cwerner also argues that aeromobility became a routine part of modern life (rather than the privilege of "kinetic elites", albeit not a mass phenomenon) in the same way as automobility, surface public transport or sea travel. Workplaces and organizations (as well as families and communities) are extended in space, as more places and people are visited, more frequently and ever more rapidly. Therefore, it is almost meaningless to analyse the dynamics of all significant areas of contemporary social life (e.g. work, business) without analysing the social aspects of air mobility (Cwerner, 2009, Kindle edition pos. 363).

Some researchers of aeromobility have attempted to analyse different strategies in connection with work, "transit spaces" (e.g. airports) and social connectivity. For example, German sociologist Sven Kesserling has analysed how freelance journalists, as a group confronted with the need for spatial mobility and flexibility, organise their mobility by developing different strategies (centred, decentred or virtual mobility) depending on their personal situation and family restrictions. Some can combine their worldwide professional networking with local integration (centred mobility management), while others rely on Internet connectivity (virtual mobility management) for their professional networking and activities. Kesserling also identifies the "hypermobile" self-employed journalist, a person who is socially and physically in constant motion without being bound to a specific place or local community. The life of such a person is extremely dynamic and he or she maintains a wide social network without boundaries between professional and private life. Their self-employment status demands competence, discipline, concentration and mental strength as well as physical travel and worldwide presence (Kesserling, 2006). The "hypermobile" lifestyle developed by some of these professionals does not, however, mean that they ipso facto belong to a "kinetic elite".

Moreover, in the late twentieth and early twenty-first centuries, the process of globalization, the deregulation of the airline industry, and the opening of new markets – e.g. in the BRICS countries (an acronym for the loose association of five major national economies: Brasil, Russia, India, China and South Africa) and central Europe – resulted in many firms establishing a global presence in order to maintain a competitive edge and excellence in innovation. Dutch sociologist Claus Lassen and British economic geographer James Faulconbridge draw attention to the employees of these global organisations, who often engage in considerable air travel in connection with their work.

Faulconbridge explains that these global firms are "knowledge organisations" because they rely either on the production or the consumption of knowledge based on networking, flexibility and mobility. To stay competitive in the "new" economy, these knowledge organisations build up their worldwide

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35 Aeromobility is the term coined by John Urry in Mobility Studies. It relates to the late modern process of society depending on air traffic (Urry 2000:59). Aeromobility– like automobility – plays a major role in structuring late-modern societies, where leisure time and tourism are particularly important (Hoyer, 2000:193).

36 The term ‘new’ economy describes the transition from heavy industry to a new technology-based economy. It is a service-based economy that revolves around the provision of services through digital (Internet based) means. Activities suggested as being part of such an economy (for example computer software production, multimedia systems) are based entirely on the knowledge of the individuals producing them, while the product is encapsulated in a digital (generally computer-based)
network by expanding their capacity to generate, process and apply efficient knowledge-based information (Castells, 1996). As well as the IT and biotech industries, examples of such knowledge organisations are also firms from financial services (banks, insurance), business services (engineering, architecture, advertising, law and management consulting), as well as academia or even the healthcare sector.

But why do the employees from knowledge organisations travel in relation to their jobs? Is the high level of international travel by air in these knowledge organisations a result of work demand or employee wishes alone?

Fulcombrigde suggest that these "knowledge workers" (term coined by Peter Drucker in the 1960s) although they do not belong to the "kinetic elites", rely on extensive air travel for work-related purposes because face-to-face interactions (e.g. meeting with customers to close a deal, attending a course or conference) still remain a critical component of the global workplace. Success depends on the production of knowledge and effective learning (through experience, talking and reading) as well as on innovation within organisations. In this respect, maintaining virtual connections often has to be supplemented by travel to long-distance locations, as employees are expected to be present for specific events, places and people. For example, Claus Lassen has explored networking and travel in two international organisations (Hewlett-Packard and Aalborg University) and described the frequent travel of these knowledge workers as "life in corridors" (e.g. airports, aeroplanes, motorways, hotels, offices). These air travellers, according to Lassen, engage in a range of social practices, from face-to-face interaction and networking over distances to the constitution of cosmopolitan identities. He writes:

For some knowledge workers, aeromobility means new opportunities to network, to combine work and pleasure, to develop a cosmopolitan identity, to play in new places; but for others, it involves a great deal of frustration and ambivalence in relation to coping with work, family, leisure, localities, as well as belonging in between the global and local. (Lassen in Cwerner, 2009: 178).

Furthermore, he identifies a number of strategies used by those engaging in work-related air travel, depending on whether careers or families are given prominence. In consequence, the individual life strategies of "knowledge workers" are:

• career strategy (life is work, aeromobility is fundamental and necessary)
• juggling strategy (both family and work have high priority)
• family strategy (high priority to family, keep travel to absolute minimum supported by virtual mobility).
In addition, many employees of knowledge organisations escape the monotony of frequent air travel by combining work with leisure and family activities.

The superclass of global elites who constitute only a miniscule percentage of the global population is not the focus of my research. Research conducted in the field of aeromobilities studies investigates the group of people who travel extensively for work as employees of knowledge organisations (rather than the "kinetic elites"), or who work independently (e.g. self-employed journalist, artists, freelancers, media workers, start ups) and travel for work. These studies of knowledge workers concentrate on social aspects and their mobility strategies.

The question remains, however: How do these knowledge workers perceive their life in corridors and how do they behave in airport transit? In my dissertation, I have focused on constant travellers who are knowledge workers but do not belong to the privileged social group of kinetic elites, and do not qualify for the status class of frequent fliers or fly around the world in private jets. At the time of my investigation, no in-depth research had yet been done about this group of constant travellers and their behaviour in airports.

3.2 Case Study 1 – Interviews with Homo Ludens

Case study 1 embodies a key aspect of my research about living in motion. Although this research was conducted prior to my dissertation, it led me to the topic of this thesis about constant travellers. It was also the first time I started to combine architecture and social sciences to understand the relation between mobility, work and architecture.

While teaching New Media at the Zurich University of Art and Design, I was invited to contribute to an urban lifestyle exhibition called Be Creative! The Creative Imperative at the Design Museum in Zurich (2002-2003) curated by Marion von Osten and Peter Spielman. This exhibition project explored the historical shift from self-creation as a Utopia to self-creation as a social obligation, covering various developments in design discourse and everyday practice (http://www.museum-gestaltung.ch/en/exhibitions/review/exhibitions-2002/be-creative-the-creative-imperative/).

During my research for this exhibition I was inspired by "New Babylon", a utopian visionary city created by Dutch artist-architect Constant Nieuwenhuis in the 1950s. He constructed a series of architectural models and drawings that showed a totally automated city, promising freedom combined with prosperity. New Babylon was characterized by the economy of excess and lack of productivity. It was a city for *homo ludens*37, where the inhabitants acted like players in a space whose proportions were defined by the logic of mobility. Nieuwenhuis treated New Babylon as a model of the potential

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37 Homo Ludens, means Playing Man or Man the Player. Dutch historian and cultural theorist Johan Huizinga described the term in his book "Homo Ludens: A study of the play element in culture". He discussed the importance of the play of culture and society. His book is an important part of the history of game studies.
transformation of Western economic, cultural and urban spaces. It seemed to me that this transformation might already have been carried out to a certain extent, because a growing number of people (including myself) lived in more than one city.

Since the beginning of the 2000s, most important attributes of a successful economic entity have included constant mobility and flexibility. Terms such as, "frequent flyers," "living in two cities" and "global players" just some of the signs and symbols used in advertising and the media to construct the aspirational picture of "kinetic elite." This mobile lifestyle of a privileged minority of better-off citizens active in business, the media and culture, became a symbol of success. In a series of interviews, I explored the following questions:

- What does life in the world of international mobility look like?
- Has the promise of freedom connected to global mobility has been kept?

I conducted interviews with five people (a consultant in a global consulting firm, two artist-curators, a young musician and an architect) representative of creative professions and mobile lifestyles. The qualitative interviews had the character of non-structured conversations at the lunch or dinner table. I then analysed their stories and edited them in a CD compilation typical of contemporary homo ludens. I conducted and recorded their individual stories with text passages (fitting their profile) from the description of life in "New Babylon" by Constant Nieuwenhuis (1957).
Subject Profiles

Homo Ludens 1. Moved from Switzerland through Canada, Guatemala, Germany and the USA and finally returned to Switzerland. After all sorts of twists and turns she took a degree in economics. Today she works 60 to 80 hours per week in an international business consultancy. She likes changes and sees travel as part of projects – e.g. six months spent in Barcelona. She shows maximum commitment, work is an honour for her – in order to become a partner or create an ideal platform for a huge career leap. She has little or no time for friends or for herself and cannot find a proper balance. She dreams of having a family, but later, without stress or constant moving, living instead in security and stability (Fig. 72).

Homo Ludens 2. Dreamed of a career as an artist-musician in New York. Born and raised in Zurich and Zollikon, educated in commerce in Zurich. A sound engineer by trade, after six months in Rome – was breaking with old life models - and discovered new things. Returned to Zurich, then a few months in New York – total immersion in the city. Back to Zurich, then three visits to Tel Aviv – a new source
of inspiration. Many contacts remained. He does not live in comfort, enjoys the moment, does not think of Friday on Monday. Lived though the accusation of running away, chose freedom instead of money. Awaits another signal calling him for a new trip abroad, speaks five languages, feels happy (Fig. 73).

![Quote matching homo ludens 2, Constant Nieuwenhuis, "New Babylon".]

**Homo Ludens 3.** The decision to study arts outside Zurich resulted in an 8-year stay in New York. Then Mexico, Spain and the French-speaking part of Switzerland. She discovered video as the ideal form of expression, realized various projects and exhibitions. Suddenly, in Brooklyn, the question about the future arose. She decided to return to Zurich and Europe, where, in the period of transformation in 1991, a lot more happened than in New York. She was appointed a curator at Shedhalle, showed interest in post-colonial issues. Today she spends 90% of her working time abroad, as the earning opportunities on the local market are too scarce. As a person, she does not identify with any permanent place of residence. She feels that life is fleeting and ever-changing and wants to move on (Fig. 74).
Homo Ludens 4. After studying Architecture in Venice, towards the end of 1993 she takes a trip to Berlin. She became fascinated by this huge building site and the creation of a new world. This makes her seek work in Berlin. Expecting extraordinary experiences in this historic process, she spends six years in Berlin. However, the dream of research and work collapse under the pressure of brutal construction campaigns carried out in the city. Due to shrinking earning opportunities she returns to Italy. The need to be on the move, or to seek inspiration, takes her to Bolzano in South Tyrol. Then she gets another job in Milan. Present balance sheet: two flats and the question about a real home (Fig. 75).
Homo Ludens 5. As an independent artist and writer, she moved from Berlin to Zurich, travelling 900 kilometres in search of better financial prospects and more interesting work. A part-time job as a curator was the beginning of her gradual alienation from Berlin. Then came a time of involvement in international structures, the dream of continuation grew stronger. A room in Zurich, a room in Berlin. This life led to a kind of personal tug-of-war between the two cities. Over six years, her place in Berlin was reduced to a summer house, where the artist spent her weekends. Car driving gave way to commuting by train: 8.5 hours on the train, as a consequence of living in two cities, became a new life space (Fig.78).
After conducting these conversations, I analysed them and discovered that they all spoke about similar issues, which I sorted by themes such as relocation patterns, reasons for mobility, network of friends, identity, relocation aspects and vision for the future. My research revealed that these people shared a similar ambivalence although they had different mobility patterns; they wished to succeed although they felt they had to. As a result of their mobile lifestyle, they maintained distance relationships, because their network of friends and families was spread through different locations and even countries. Moreover, the range of issues extended from interpersonal relations and friendships through legal matters, the hyper-individualism phenomenon, and deregulated labour laws, to pensions. In the end, the individualism of the 1960s and 1970s which conflated freedom with movement became for these contemporary examples of *homo ludens* a state of "permanent instability" and "fluid identities" (Bauman, 2005) within the networked culture of a global society.
Exhibition

I showed the results of my research in the form of a CD compilation in the exhibition “Be Creative! The Creative Imperative” (Zurich, 2002-2003). The urban lifestyle zone in this exhibition represented an airport waiting area consisting of coffee tables. The official documents of a typical mobile person – entry visas, visa applications, work permits etc. – were presented on these coffee tables (see Fig. 8). Audio points with Homo Ludens interviews accompanied this cartography of controlled movement.

My research included a slide projection about Nieuwenhuis’s "New Babylon." I also showed a collection of books and magazines about mobility and architectural utopias of the 1950s and 1960s, including the Situationists International and the British architectural group Archigram, and a video on modular and flexible Italian designs from the 1972 exhibition in MOMA New York. (http://www.k3000.ch/becreative/tour/tour_7.html)
The following section will discuss how architects and interior designers reflect mobility in their designs for the modern workplace.

### 3.3 Design Approaches to the Mobile Workplace

In this section, I will show how developments in Information and Communication Technologies (ICT) and use of telepresence have created new office conditions, such as networked environments and the use of the airport as a workplace. This changed the way mobile workers interact with others. These changes also impact the design of physical space supporting mobile work in the hybrid space of the airport.

**Agile Workplace**

Triggered by mobile and wireless technologies, work today has developed new temporal and spatial conventions. Mobile work does not rely on simultaneity of either time (co-presence) or place (co-location). As a consequence, office buildings are no longer the sole locations for mobile and knowledge workers. These workers focus mainly on communicating, sharing and developing ideas, and their tasks can be performed in many other places than the office. They are equipped with mobile devices and perform their work at home, at the client site, or the move – in restaurants, cafés, cars,
trains or airports. They only need to come to the office to communicate with their colleagues or enjoy their company.

Work and the workplace have been transformed today from a predetermined, standardized and stationary office into an "agile workplace" that supports many ways of working. And workplace boundaries have expanded to support work at any time, in any place, with anyone. Furthermore, a world’s leading information technology research and advisory company, Gartner and Massachusetts Institute of Technology (MIT), reports: "the cyber/physical connection is facilitated not only by digital desktop and hand-held devices, but also by furniture and building components embedded with such features as television screen walls and holographic imagery for video conferences." (Gartner & MIT, 2001) And as mobile workers collaborate across the boundaries of time, space and geography, in teams rather than forming hierarchical structures, careful design of office space has become crucial to attracting and keeping them. What, then, are the new design strategies for work on the move?

**Interconnected Activity-based Office**

Because workers are making their own decisions about when and where to work, many contemporary office interiors are beginning to look more and more like coffee bars. British architect Frank Duffy has observed that "a new vocabulary is emerging to describe the widening range of mobile work experiences and work styles – ‘anchors and residents’, ‘drop in centres’, ‘virtual working’, ‘concentrated’ versus ‘collaborative’ work" (Duffy, 2008:48). What do these new ways of working mean? As office design must itself reflect these new ways of working, many global corporations are – together with architects and office planners – investigating what kind of offices we require today.

Knowledge work is a continuous activity because it requires thinking, developing, sharing ideas, communicating and collaborating with teams in many different (but generally hybrid) spaces, rather than solitary activity in a single, purpose-designed room. These activities are hard to schedule on demand, and informal meetings are more productive than if formally designed. "Taylorist" office buildings with "Open Space" layout planned for mechanized office work and better management of workers assigned to specific workplace no longer support the way people work today. Before the intensity of commitment was measured by the time spent behind the desk, now intensity of commitment is measured by the results. Therefore, new office concepts do not provide assigned desks or workspaces, but rather they support the idea that work does actually happen there. Pioneer examples were global companies in IT, telecommunication, banking and the insurance industry such as Microsoft, Google, Facebook, Credit Suisse, UBS and many more. These office concepts, called activity-based offices, dynamic workplaces, multi-space or component offices, incorporate a diverse range of settings, with organized and interrelated zones, that enable local and (globally) distributed teams to stay connected and collaborate efficiently in an essentially hybrid space. These settings for individual work are, for example, touchdown areas, focus rooms/enclaves, assigned workstations and
private offices. Training rooms, cafés, project/shared team spaces are examples of areas for collaboration. In all these places, the requisite technology is embedded in a diverse range of settings, while office design provides the possibility to sit, stand or move throughout the day.

But this is still not enough to create a set of conditions for individual and group work that anyone can use. Designing a space for mobile work requires considering different work styles, mobility and job requirements. Some people in the company might require a dedicated space for their work but should remain mobile within an office space that offers flexibility. Other more mobile workers, among them the constant travellers, might need a place that supports physical and virtual collaboration on the move. Generalization is not fruitful here, and I would argue that behavioural studies are a prerequisite for successful design for mobility and work in hybrid space. Airport design does not yet reflect these developments: in fact the airport needs to be thoroughly re-designed to cater for mobile work.
Networked Office

As a response to the demands of our increasingly mobile knowledge economy, and as an alternative to the Taylorist model, Duffy (2010) has proposed the networked office. A demand-led system of allocating space within and outside office boundaries on the basis of work patterns, this concept combines the potentials of physicality and virtuality, and allows for the fact that work happens in a multiplicity of locations. Duffy distinguishes between the core office space managed by an organization (office building, cafeteria, team table, project room, training centre, specialist facilities etc.) and the non-core space maintained by others (client site, home, garden, café, restaurant, car, train, airport etc.).

Building on the tendency towards fragmentation of hybrid work activities, the networked office, Duffy argues, transcends conventional architectural boundaries. The office building alone is now a misleading category for mobile work, if this is to be efficient, enjoyable and compatible with other activities. It is important that architects take advantage of entirely different kinds of relationships between technology and people, and between time and place (Duffy, 2008:55). They need to develop new design strategies for shaping flexible and mobile work in the cities, as well as to better facilitate existing buildings and contribute to creating sustainable environments. Airports and other mobility environments constitute the networked office. I would argue that in order to understand the further potential of air travel and mobile work in hybrid space, architects and designers should blend...
conventional architectural methods with inspirations from social studies. In particular, behavioural studies and participative planning are crucial for developing designs that support mobile knowledge workers, including constant travellers.

**Emerging Typology of the Shared Workplace**

Wireless communication and mobile devices changed how people work, communicate with each other, and relate to places. By the end of the 1990s this technological development allowed (initially mostly in IT and the creative industries) for a change in employment strategy and the rise of freelancers – also called "permalancers" or "e-lancers" – working from home with no corporate office space (Brittenor, 2008). But soon these new home-workers realized that working in virtual space leads to alienation and does not replace face-to-face interaction with others. So they started to work on their laptops and mobile devices from coffee shops and hotel lobbies, and quickly discovered that they were more productive when working in public space than working alone at home in isolation. Moreover, these highly specialized and permanently connected nomadic workers (Kluth, 2008) avoided expensive office costs (only laptop, mobile phone, passport in a briefcase, Wi-Fi access). But coffee shops and hotel lobbies lacked appropriate workspace for these teleworkers. These developments led to the emergence of a new type of workspace, called co-working spaces. American architect and expert in workplace strategy Melissa Marsh described co-working as “both a spatial and an organizational business model where individuals or team come together in ad-hoc or purpose-built spaces rather than-or something in addition to working in traditional offices, in home offices, or in third places such as coffee shops, libraries, and the like” (Lister & Marsh, 2014).

But who are these mobile co-workers? According to deskmag.com, an online magazine about co-working, most co-workers are freelancers, entrepreneurs as well as salaried workers (20%) from organizations (e.g. Steelcase, JLL, CBRE, Marriott, Hilton, Expedia). But constant travellers might also work in these spaces, because these shared workspaces are rapidly expanding. In 2013, almost 110,000 worked in 2500 co-working spaces worldwide (Foertsch, 2013).

Co-working is growing in popularity because the concept provides economical solutions for sharing technological, administrative and physical infrastructures, and offers not only income opportunities for freelancers, but also a social context for all co-working members who can use these spaces on demand, in every city they are travelling to for work.

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38 By the end of the 1990s there was a change in employment strategy due to cost optimization, reducing the responsibilities of full-time employees and hiring expensive, experienced people on a freelance basis.

39 A 2011 Deskmag survey of more than 1500 co-workers in 52 countries showed that 75% reported an increase in productivity since joining their space, 80% reported an increase in the size of their business network, 92% reported an increase in the size of their social circle, 86% reported a decrease in their sense of isolation, 83% reported that they trusted others in their co-working space (Source: http://www.deskmag.com/en/all-results-of-the-global-coworking-space-survey-200).

40 One of the first co-working spaces was a hacker space, called C-base, founded in Berlin in 1995. Hacker spaces are usually community-operated workspaces to meet and work for people with common interests (computer, machining, technology, science, digital art and electronic art). These spaces are considered to be the first models for co-working.
Many co-working spaces are open-plan with soft seating and desks based on a flexible occupancy arrangement. They also offer small meeting rooms or spaces for private conversation. Design of these spaces, like that for the activity-based workplace, attract and reflect work behaviours that are informal and have flexible schedules; they focus on work effectiveness and space efficiency. Co-working spaces are designed for:

- **Community** – spaces that foster socialization as networking capital (e.g. cafe, lounge),
- **Collaboration** – supporting self-organization of teams in hybrid space (e.g. team tables, workshop rooms, video conferencing)
- **Concentration** – areas that support individual working in quiet zones (e.g. quiet work zones, assigned workspaces, fully-enclosed space for privacy, informal meeting rooms).
Because these spaces offer different values to different target groups, they create a sense of differentiated community and aesthetics. Therefore, they have multiple identities for multiple work practices and cultures.

The co-working concept has given rise to seven forms of shared workspace. These are:

- Co-working spaces,
- Brand café (advanced internet café to attract consumers to their brands),
- Hospitality lounge (hotels offering co-working space e.g. Marriott on liquidspace.com),
- Launching pad (investment ventures involving public/private partnership for start-up companies),
- Culture club or co-habiting (creative workspace offered by 4 corporate companies to their employees),
- Open house or innovation hub (developed by corporations to foster creativity),
- Working commons (universities providing spaces to meet, study, make social connections and exchange ideas).

These various forms of co-working show that today many people (including constant travellers) work differently because mobile work in hybrid space demands flexibility, the exchange of ideas, and intensive collaboration. Airports, therefore, need to be re-designed for mobile work that happens in various hybrid settings, as follows:

- 1st place – company office space,
• 2nd place – home-office, client site,
• 3rd place – train, car, airport, serviced offices and casual spaces like coffee shops, gardens, libraries, park benches,
• 4th place – shared workplaces based on co-working concept.

Architects and designers must find ways to design airports as workplaces that are appropriate to emerging technologies, the global economy, and the needs of constant travellers. To rethink the airport as a workplace, architectural methodologies must be combined with social studies in order to provide a deeper understanding of these changes.

The following case study is based on my practice as a workplace consultant.

3.4 Case Study 2 – User Participation in the Design of the Hybrid Workplace in Hospital.

Methodology
Interviews and workshops involve users in design and change management processes.

While working as strategic workplace design consultant for a hospital, I observed that doctors are also mobile (knowledge) workers and use advanced ICT technology in their work activities. In particular, hospital ICT systems are used for monitoring patients (sensors, large display monitors, buzzer/alarm, printer), expert systems that allow staff with limited medical knowledge to get advice from a computer, diagnosis of illness (body scanners, CT, MRI, full colour images in 3D), and managing patient records (computerized databases with patient medical data). In effect, hospitals are transforming into highly technological work environments and doctors are working in hybrid workspaces. Moreover, the work process in hospital is highly diversified. Doctors’ everyday activities include close contact with patients, administration of patient data, reporting, meetings and collaboration with colleagues, as well as knowledge transfer between partner hospitals and academics over distance. These developments indicate the need to re-think strategies for hospital workplace planning and to create hybrid work environments that support team collaboration and work flexibility. Therefore, doctors’ involvement from the early design stage was necessary to better understand their needs and work processes and to inform design. In this case study, I investigate ways to generate empirical data about users and to explore the potential of the activity-based workplace in the hospital context.
Background to the Project

Winterthur Canton Hospital (KSW) recognized the need for transforming the workplace environment and recently introduced a pilot project to examine the potential of mobile work for doctors. The hospital also needed to accommodate a rapid growth in hospital staff, and to optimize the use of hospital space through workplace management. Two questions arose:

- How to create an open workplace environment for doctors that is quiet and at the same time promotes collaboration?
- What design strategy would help to create a cohesive workplace that would boost the quality and efficiency of doctors’ work?

As a strategic workplace consultant and designer, I was asked to lead this project. In this instance, I succeeded in convincing the client that managing (behavioural) change requires holistic design thinking (user-space-technology), as well as active user-involvement (co-design) in the planning process. Close cooperation with users (doctors), IT departments and hospital management was necessary to identify how doctors work, the gaps in the various systems, changes in working habits, and the potential for improvement. Interviews yielded enough insights to develop a workplace design solution that was enjoyable to spend time in and practical to use, and a work environment that was far more collaborative, transparent and efficient than it had been hitherto. The primary goals of the project were:

- To combine architectural design methods with group interviews and participatory user workshops to inform design,
- To encourage doctors to participate actively in the design process (co-design)
- To understand complex work processes and interactions with technology,
- To envision novel ways of interaction and collaboration for doctors working in the hospital,
- To enable new forms of interacting with technology,
- To develop new workplace strategy for doctors working in KSW hospital,
- To design a workspace that encourages doctors to adopt new behaviours, adapt to virtual work, and work fluidly throughout the hospital.

Project Approach

Rolling out these workplace strategies could only be achieved in various phases. The project, which is still work-in-progress, consisted of the following steps:

- Phase 1 – Pilot project: Open space (with desk sharing) workplace for surgery department (retrofit), duration: October 2013-May 2014,
- Phase 2 - Development of activity-based workplace design guidelines for architect (new building), duration February 2014-June 2014,
• Phase 3 – Development of team-oriented/open space workplace concept for children and teenagers medicine department, duration June 2014- April 2015

• Phase 4 – KSW workplace strategy and design guidelines for new hospital building, starting mid-2015 (work in progress)

Below, I discuss the data gathering and design methods that I applied to the design of a hybrid workplace environment for doctors.

Integrated Approach to Needs Assessment and Participatory Design of Hybrid Workplace

The traditional architectural design process is divided into preliminary design, development design and construction. Usually the design concept is developed according to a design brief (space programming) delivered by the owner. Although project development requires the involvement of many stakeholders, the future users of the designed space are rarely part of the project development team. In this case study, the owners did not prepare a design brief. Therefore, I could explore the potential of combining needs assessment with a participatory design process.

At first, each project phase involved preliminary data gathering methods such as usage data (gathered from stakeholders about head count, computer usage, etc.) and a walk-thru of the existing workspace to understand work processes and behaviour. These data gathering methods helped me learn more about existing space usage in preparation for group meetings. These were structured in accordance with the following example of Phase 1 (Pilot project for open space with desk sharing).

Phase 1 – Homogeneous Focus Group: User Representatives (3 surgeons), project manager and IT representative. Partially involved were also hospital owners, and head of department.

1 – Needs Assessment (Group Interview)

The aim was to understand doctors’ needs, motivations, and behaviours – what they do, how they do it and why. The following questions were asked:

• Usage data: Head count, part-time / full-time employment ration / planned growth / team structure
• What kind of tasks and other activities do you perform?
• What is the typical course of the workday (time schedule)?
• What spaces (e.g.: meeting rooms, coffee corner, focus room etc.) are required to perform these activities?
• What are the IT requirements (hardware and software) to support your work activities?
• Kind and size of storage space needed? Could it be reduced?
• What is absolutely necessary, and what can be set aside?
• What is your vision of a perfect workspace?

After gathering initial information from stakeholders and users, further meetings focused on participation of the users in the iterative conceptual design process and (cultural) change management. This process consisted of group meetings with a workshop character (presentation of design stage and discussion of the outcome, feedback from user informing further development). The main aims of these workshops were to involve users in a dialogue/reflection about their actual needs in an open space (this may differ from what users reported in interviews) and how they could adapt their work habits according to the potential of the proposed design solution. During these series of workshops users played an important role as project co-designers.

2 – Group Workshop – Feasibility Studies

The main aim was to discuss findings of feasibility studies based on information gathered and spatial design constrains. The three initial layout sketches and project examples for activity-based workplaces were presented to users, and the following issues were discussed:

• What aspect of a doctor’s work processes and needs are reflected in these layout options?
• How could these solutions enhance communication and collaboration between doctors and allow concentrated work?
• What are the technological requirements (software and hardware) to support flexibility of mobile work and collaboration?
• Which of the suggested layout schemes has the most potential for further development of hybrid workspace?

The scheme below illustrates the results of the data gathering from group interviews and feedback for the first workshop. So far, doctors were very defensive and had very fixed ideas of how they wanted to work in a new and undesired open-space work set up. They stressed the need for maximum focus space for concentrated work, storage space and preserving assigned workspace (desk sharing only for newly hired doctors).

3 – Group Workshop – Workplace Concept

The aim of this workshop was to introduce a workplace concept for desk sharing (Fig. 86) and inspire doctors as to how they could benefit from activity-based workplace principles. During discussion with doctors more detailed information about actual user needs (e.g. desk size, personal lockers, caddies vs. storage), spaces (e.g. focus rooms, coffee lounge), and technology (e.g. special software needs,
printers, monitor size) informed further design development. At this point, doctors could follow the design decision process, were open to new ways of working, and agreed on a layout for further development according to their feedback.

**Fig. 85.** Personal storage concept for desk sharing included containers, lockers with toolbox and flexible panels for privacy at workbench. Offconsult AG/ Codourey (2013-2014)

4 – Group Workshop – Design Solution

The aim was to discuss the design solution with spaces supporting informal collaboration between doctors and gain their approval for detailed design. This workshop focused on discussing the following questions:

- How can designed spaces such as media meeting room, coffee lounge, brainstorming walls and pinup walls support knowledge exchange between doctors?
- Which set of tools e.g. cordless phones, laptops, zero terminals, personal storage, toolbox) would support flexibility and mobile work in the proposed hybrid workplace concept?

As a result of the workshop, doctors had a choice of different work settings depending on their activities, such as desktop, cafe lounge, media-enhanced meeting room or focus room (Fig. 87). As the design concept was at this stage accepted by users’ representatives, the proposal for a material and colour concept could be developed for the following workshop.
Fig. 86. Landscape of workplaces to use depending on activity: desktop at workbench, café lounge, media enhanced meeting room, focus room for isolated work. Offconsult AG/ Codourey (2013-2014)

5 – Group Workshop - Material and Colour Concept

The aim was to discuss a material and colour concept for the chosen design solution and ensure that all workplaces were equally treated. Important aspects of space quality involved choice of materials with respect to:

- acoustics measures to lower background noise (e.g. installing carpet, acoustic panels and curtains in focus rooms)
- light concept
- level of transparency (e.g. milk glass for focus rooms and entrance door)
- choice of colours
- vertical green elements next to desks without direct natural light source.

At this stage, the user representatives, together with the designer, presented the project to other doctors. The medical group felt responsible for the project outcome and totally identified with the projects as co-designers.

Moreover, they not only participated in the design process but also made their own suggestions. For example, they developed an icon-based user manual for open space, organized an opening event with a small welcome gift for other users, and wrote an article for the internal newsletter. Furthermore, to ensure the success of the final project outcome, user representatives were also punctually involved in further stages of the planning process (design development, construction, implementation), and short information meetings were held on a regular basis.

Although integrating needs assessment with a participatory design process is time consuming, this method can provide valuable insights into the behaviours, attitudes, and preferences of users. This particular method helped to identify key design elements that were very useful, as well as elements that were inadequate. The design solution to enable desk-sharing and mobile work included:
• ICT concept (introduction of laptops and zero client login terminals),
• Communication in space (billboards, idea paint walls),
• Emotional components (green wall, home aesthetics – curtains, sofa, kitchen, carpet flooring, blue earth tones, workbench with privacy panels),
• Creating alternative zones to work and encourage choice and work mobility.

At this stage, it was not possible to change the paper documentation process, so some design compromises were made to provide additional storage space.

Fig. 87. Plan of retrofit and proposed layout solution, Offconsult AG / Codourey (2013-2014)
Intensive group interviews and workshops revealed that it was not possible to come up with successful design solution for open space and desk sharing without reflecting on work processes and ICT use. So
far surgeons had worked with PCs and paper-based work processes (patient documentation). A holistic design approach, looking for solutions combining space, ICT and people was, therefore, necessary. Active involvement of surgeons’ representatives in the design process proved to be a successful approach to the design of an activity-based workplace solution with alternative spaces to relax and collaborate. The doctors immediately appreciated the new possibilities (e.g. working with a laptop from the sofa) offered by this open space. This was something they had not imagined and did not consider an advantage before participating in the workshops mentioned above. This new work environment gave them new possibilities to work alone, as well as collaborating with others (e.g. in the meeting room with media).

At this stage of the process, results show that both intensive involvement of doctors in the design process, and accurate observation of their ways of working, were necessary, first to understand and then to provoke change in their attitudes and behaviour, by creating an environment that enhanced interaction and the seamless use of technology in the workplace. Emotions are also important in designing mobile workspace environments. For example, adding green wall elements next to a working area remote from any window created a preferred working space for many doctors.

An important aspect of this project will be the evaluation of the designed mobile workspace. Post-occupancy evaluation (POE) studies will be necessary for further development of workspace with embedded technology.

I will now describe the next phases of the project in order to compare what factors should be taken into consideration while engaging stakeholders in a participatory design approach.

**Phase 2 – Interviews with Heads of Departments of Radiation Oncology**

The second phase of the project was to develop a workplace concept for the new building of radiation oncology department. The architect who designed the building proposed the first draft. Unfortunately, his proposal was not convincing to the doctors, and I was asked, together with the doctors, to develop design guidelines for the architect. I conducted a series of meetings with doctors in six interviews. The design solution was based on their responses during these meetings. This belief is a typical misconception people have towards interviewers asking about people needs and wants.

The concept was consequently built on feedback from interviewees (rather than co-design) complemented by experience from a previous pilot project. Finally I presented a design solution to the architect and summarized all the issues in a design guideline booklet for inclusion in his design concept.
Phase 3 – Participatory Design with Heterogeneous Focus Group for Dept. of Children and Youth Medicine

The doctors of the Department of Children and Youth Medicine initiated the third phase of the project. They had seen an opportunity for more team-oriented work when they moved to a newly designated space that needed to be refurbished. In this project, a heterogeneous group of users (e.g. hospital nurses, interns, senior, head and chief doctors) participated in project meetings. In this case, participants in the workshops rotated (different user representatives), and meetings were structured more like project meetings (led by KSW stakeholders), which did not fully encourage active involvement in the project. Moreover, different hierarchical levels often led project discussions off the track, focusing on internal politics and the expression of hierarchical status. Nevertheless, in the end we developed a workplace concept that supported teamwork in hybrid space.

Phase 4 – Participatory Design for new Hospital Building (work in progress, start mid-2015)

I have learned the following lessons from this case study:

• it is important to carefully structure the participatory design process
• select focused groups and clearly communicate roles and expectations
• choose user representatives that can commit required time to the project
• form homogeneous focus groups for workshops to avoid distractions
• involve it representatives during the participatory design process from the start
• integrate architect in the participatory design process from its inception.

These experiences led to designing the participatory design process itself (see Fig. x for reference), before going on to the actual task of designing a hybrid workspace for the newly designed hospital.
Fig. 9.1 Process Diagram of Phase 1 and Phase 2 - Participatory Design of Hybrid Workplace in Hospital

**Phase 1**

- Participatory Design Process (co-design with homogeneous focus group)

**Phase 2**

- Interviews with Heads of Department (no involvement of focus groups)
Process Diagram of Phase 3 and Phase 4 - Participatory Design of Hybrid Workplace in Hospital
Summary of Chapter 3

Living and working in hybrid spaces, we need to share information and collaborate differently. How can this come about? A set of suggestions:

- Design has to respond by understanding the needs of workers (activity based office),
- Combine architecture and social science methodologies,
- Conduct behavioural studies,
- Involve users in the design process (participative planning),
- Focus on case studies of particular groups (e.g. constant travellers) in order to support their needs more specifically.

The design of activity-based office space is incomplete if mobile work is not supported in these places. Because mobile work is independent of space and time, airports are also workplaces for constant travellers, and airport design must address their need to work and travel in this archetypically hybrid space.

In the next chapter I will investigate how the work experience in airports could be improved for constant travellers.
Chapter 4

Work & Air Travel Experience of Constant Travellers

As discussed in previous chapters, airports are inhabited by constantly on the move and co-present members of the global society. For these people, fast and efficient air travel is essential for their business. However, in the context of my research the following questions still need to be addressed:

• What group of air-travellers has not been extensively studied?
• What kind of behavioural patterns and technologies help groups extend their workplace?
• Are there separate groups of constant travellers who do not belong to "kinetic elite"?
• What decision-making patterns and activities are relevant in relation to airport flow-space?

These questions might require a combination of social methods with qualitative and quantitative analysis. This chapter will focus on a group of air-travellers I have identified as constant travellers.

4.1 Constant travellers – Behavioural Studies – Methods

Constant Travellers

Before I began this dissertation, I conducted field research studies at Frankfurt International Airport that led me to identify the constant traveller. Within this analysis, it became evident that many generalizations existed about what a passenger looks like, thinks or feels. Because of these generalizations constant traveller needs have not been addressed in airport design and their behaviour has not been studied. These generalized passengers are called PAX. But why do they exist?

The aviation industry still uses three letters (PAX) while looking at passengers in the airport. For them, PAX represents a generalized view of what a real passenger looks like, thinks or feels. In other words a "predictive passenger."

According to the English sociologist Tim Cresswell, PAX is essentially the “transformation of mobile bodies into a legible record (Cresswell, 2006: 238). In other words, PAX is an abstraction and simplification of real passengers. According to one report, PAX resembles "a unit regarded as being of a basic standard, usually miniscule in size, somewhat lacking in both intelligence and general ability to find his way about (especially if he is a holiday traveller on a package tour)." (Adey, 2008: 438)

Although this research was conducted prior to my dissertation, it led me to the topic of this thesis. Therefore, I will now re-reflect this investigation.
My qualitative field research (duration: 2x5 days) was mainly based on observations and interviews with border control officials (German Border Control BGS and Customs ZOLL), as well as Fraport AG (full service provider and airport management company for Frankfurt Airport), Lufthansa Airlines and Caritas (largest welfare organization in Germany) employees. It also included participative observations in airside and landside airport spaces. My methods consisted of visual ethnography (photo and video documentation) and interviews.

In this case study, field research methodologies were combined with methods used in ethnographic research that extended these methods that had already been applied by other researchers into urban and architectural research (Bauhaus Dessau, 2005). The aim of my field research at Frankfurt International Airport was to explore physical manifestations of the national borders in airport architecture. The results of my research were the point of departure for the creation of maps of the diverse transit conditions of air travellers and provided a basis for production of a video devoted to the subject. More precisely, I found that by observing the patterns at borders it could be a fruitful way to identify differential speeds by which people move through these thresholds and collate those with different patterns of social-spatial mobility.

Airport borders are no longer strictly national, and in some cases the border condition can turn into a space of its own. Furthermore, the transit zone is ipso facto declared extraterritorial by the division of the airport area into landside and airside. In the case of refugees, airside is a jurisdictional exclusion that extends beyond the airport space into an asylum prison. After ten days of observing the differential speeds that operate at the various different thresholds at the Frankfurt Airport, I confirmed that the border is an important issue in the study of architectural space, because it is not possible to mark the border physically within the footprint of the airport. In fact, the global border is detached from physical space. It is an abstract condition regulated – and indeed constituted – by the laws, rules and agreements that govern it.

The following illustration shows the results of this part of the research.
My research also showed that nationality and travel status is a measure of the speed of processing in the airport border. This runs counter to the perspective of the airport industry, which sees PAX – one type of passenger – in the airport space, I claim that this is a limited vision of the passenger, dominated by logistics.

Furthermore, the different orders of legal categorization create manifold sub-territories: a low-cost airport; the division of lounges into business, senator, HON and first class; a luxuriously styled separate terminal for premium travellers, and a detention camp accessible only to select groups of
travellers. These sub-territories and their implicit mobility patterns circulate within the airport structure, and are distributed within the architecture according to their typologies of comfort, aesthetics, control, etc.

The variety of these spaces made me ask what kind of experience might be produced by their implicit aesthetics? Do these designs respond to the actual needs of constant travellers? Current designs seem only to address the social, political and economic status of passengers in transit. Do they sufficiently accounting for the need of constant traveller?

In order to analyse the situation more closely, I reduced and re-ordered Urry’s taxonomy of twelve mobility forms (Urry, 2007:10) grouping them into six main types of travellers. These are: the event tourist (discovery student travellers, au-pairs, overseas experience traveller, medical travellers, etc.), the package tourist (holiday package tourist), the cross-border migrant (transnational lifestyle, service worker), the "enforced cosmopolitan" (asylum seeker, refugee, homeless travellers), the “kinetic elite” and the "constant traveller" (work-related travel of knowledge workers for business and professional purposes).

Constant travellers are an emerging group who neither belong to the privileged social group of air travellers called the "kinetic elite", nor qualify for the airline status of frequent flyers.

Constant travellers are business people and professionals who are constantly on-the-move for work purposes and whose work activities are geographically spread between countries or cities. The frequency of travel is not as relevant as the fact that the space in between destinations has become for them a continuum. They incorporate transit spaces into their everyday life activities and create informal, small-scale transnational networks consisting of interpersonal connections, often putting down multiple roots. This observation led me to apply for funding to study this group of air-travellers further.

Constant Traveller Studies (Aims and Methods)
In 2008, I was fortunate enough to be awarded an artists-in-labs residency grant and to spend nine month in the Human-Computer Interaction Lab (HCI Lab) at the University of Basle. I applied for this
residency with the intention of developing a prototype for a pervasive game for constant travellers in the airport. I was interested in how researchers in the field of human-machine interaction focus on the interface between the user and the system when this is endowed with high usability. Furthermore, I wanted to understand how they use the principles of cognitive psychology to interpret complex patterns of interaction between human and machine in order to improve the system. I was, therefore, curious to see whether the understanding of usability methods could help me in the design of my pervasive game for constant travellers.

In particular, I aimed to study the impact of the physical and informational mobility of constant travellers on their perception and behaviour while traveling for work purposes. My questions, therefore, were:

- How could I test my thesis about constant travellers as a passenger group?
- Can constant travellers be recognized by particular emotional, behavioural and cognitive patterns?
- How do they interact with mobile technology?
- What psychological methods can be applied to the study of constant travellers?

In the Institute of Psychology’s HCI Lab, I worked with PhD students Sandra Roth and Alex Tuch, both of whom were employing quantitative surveys in their research into psychology and human-computer-interaction. When I presented my concept about the lifestyle of constant travellers, they inspired me with many psychological questions and methods that I could apply for interviews. They showed me which methods in psychology and what techniques they would use to conduct interviews with constant travellers. Their experiences came from experimental and developmental psychology studies, and we developed a very successful dialog by meshing this with my practical experience in conducting qualitative interviews for my own art-based practical research. Finally, we presented the concept of the constant traveller in a seminar, requesting the students to discuss a variety of methodologies that might be suitable to apply to a group of travellers. We concluded that a combination of qualitative with quantitative methods would be the most successful way to approach this problem. The qualitative interviews would provide more background information to develop questions for the quantitative study, which would in turn constitute an essential aspect of my research method. This type of analysis is not usually applied to design practice. So I decided to pursue the survey and test how such an investigation would benefit constant travellers. I applied the method to my research by first interviewing a selective group of people on a qualitative level (Study 1) and then conducting a survey on the quantitative level (Study 2). Excerpts from this experience are recorded in the artists-in-labs DVD in the appendix (Scott & Hahne, 2010).
**Methods**

The study focuses on the behavioural study of constant travellers from a trans-disciplinary perspective involving architecture, human-computer interaction and psychology. The case study investigates the impact of physical and informational mobility on airport perception and behavioural patterns of air travellers who work in hybrid spaces. My main question was: how can behavioural research help to improve the experience of hybrid airport workspaces? I had the following aims:

- To identify the constant traveller group and describe its profile,
- To formulate behavioural patterns for work-related travel,
- To examine the group’s emotional and cognitive patterns in airport space,
- To find out how they use their mobile devices during air-travel,
- To construct procedural maps for work-related travel,
- To evaluate how results of the research could inform airport design.

**Multiple Studies**

As indicated above, I needed advice from HCI researchers to help me establish an empirical research framework. Study one was qualitative and study two involved quantitative data gathering.

- Study 1 involved a set of exploratory interviews with 11 people who matched the constant traveller label. I wanted to end up with a procedural map of work-related air travel and link this to design questions for the qualitative survey.
- Study 2 involved a quantitative survey of 165 people in order to prove the existence of this new air-traveller group. I needed to gather more evidence that could support the results from the exploratory interviews in Study 1. I was also interested to use the SPSS software at the University of Basle in order to evaluate the quantitative data.

The following diagram illustrates how I designed my methodology to study constant travellers:

![Diagram: Methods and Methodology, Monika Codourey (2008)](image)

As can be seen from the above diagram, there is a direct link between background research, behavioural studies and architecturally situated design that correlates with the premise of my thesis.
These studies of constant travellers were paramount for my research because they utilized results from social science methodology to provide structured insights for architecturally situated design. The hope is that the result of the research achieved from pursuing this methodology would improve the experience in the airport for constant travellers.

4.2 Study 1: Exploratory Interviews

Formulating the Questions

The main aim of this study was to gather information on constant travellers as a basis for the formulation of their needs in relation to mobile space and interface. The results of this study would also help me to design questions for a quantitative study to provide evidence for that formulation.

The questions were semi-structured and adjusted to specific interviewees in order to gain a better idea about the subject. They were formulated openly and arranged in thematic groups to avoid any bias.

Part I: Professional background (to understand background, education and career development)

- What work position do you have?
- What are your duties and responsibilities?
- How is your work related to your educational background?
- At what stage of your career are you?
- Do you live in your country of origin?
- Did you leave your hometown for work purposes?
- If yes, how often have you relocated so far?

Part II: Travel Patterns (to determine frequency and attitude towards air travel)

- How often are you on the road?
- When did you start your work-related travel lifestyle?
- Why is travel essential to your work?
- What criteria do you use to plan your itinerary (routes, airlines, hotels)?

Part III: Lifestyle: "My office is where I am" (to investigate mobile work pattern)

- Do you have your own office space/desk?
- Where do you work when you are away?
- Do you use any mobile travel devices such as mobile phone, laptop, PDA, etc.?
- How do you organize your work with these devices?
- How do you use/understand your travel time; the space between destinations?
- What kind of activities do you engage in while traveling by plane, train, car?
- Do you identify yourself with the term “constant traveller”?
- What social status would you apply to such a lifestyle?
Part IV: Behaviour in transportation hubs (to understand emotional reactions and attitudes to air-travel)

• What kind of activities do you usually engage in at the airport?
• What are your favourite places at transportation hubs (lounges, restaurants, shops, etc.)?
• What kind of feelings do you associate with being on the move?
• Do you feel stressed, impatient or lonely while travelling?
• How do you deal with delays? If delayed where do you spend your time?
• How do you find your way around transportation hubs?
• How do you feel when you cross security and border checkpoints?
• Do you travel business or economy?

Part V: Personality. What kind of character is required for mobile work and air travel?

• What characteristics or qualities do you think are required to be a successful constant traveller?
• In relation to your lifestyle – what are your strong and weak points?
• How do you combine a mobile work-lifestyle with your private/family life?
• How do you maintain your network (private and work-related)?
• Where do you see yourself in the future?

After designing these question sets, I had to find who could be considered to fit the profile of constant travellers who were willing to be interviewed.

Procedure

To avoid distortion effects due to age, social or educational context, computer, and Internet literacy, I chose a heterogeneous group of at least ten interviewees for participation in this qualitative study. I contacted potential respondents personally, via recommendation from friends or through Google and social network sites such as Linkedin.com, Facebook.com and Dopplr.com (social networking site for frequent travellers). These were travellers who work for global corporations, professionals like engineers, architects, artists, creators, freelancers, media workers, academics, global consultants and investors. I asked them for voluntary participation, informed them about the research purpose and applications and constructed a set of criteria for screening the interviewees:

• Mobile rich: people who travel extensively between countries or continents for work,
• Corporate representatives who regularly travel between various locations of a corporate empire,
• Travelling academics, artists, media workers, freelancers and others,
• Mobile workers whose office/workplace is wherever they happen to be, with no fixed address.

Then I conducted most of the interviews in person but also via Skype or email. For recording interviews I mainly used video, but in a few cases voice recordings, notes and/or email. I offered these
formats as options for each participant. Furthermore, I informed interviewees that I would only use the recorded material for publishing purposes with their approval and that I would ensure their anonymity. Before each interview, I briefly explained my research, the content of the interview, the approximate length and procedure of the survey. In order to relax the participants I used the following preamble:

“For me, it is important to know how you see things. So you can tell me anything you want to, whatever comes to your mind on this topic. Do not hesitate to ask if you do not understand my questions, or if something is not clear. I will ask you additional questions if I want to know more or if something is not clear to me. Please do not be irritated if I do not say much. For me, the most interesting thing is what you have to say”.

Results of Study 1

My psychology advisors at the University of Basel were sceptical that I will be able to find people who would be willing to talk to me. However, it was surprising that most of people I approached wanted to talk to me. Even though, feel that traveling is banal, it seems people still want to talk about their travel experiences and work style, to others.

I approached 28 people for interview: 21 agreed to give an interview, 1 person refused to give the interview because of time constraints, and 6 people did not respond at all. In the end, I conducted twelve interviews: 2 from the IT sector, 3 professionals with their own practice (architecture, design, electrical engineer), 1 artist/curator, 1 media worker, 1 global consultant / property investor, and 3 academic researchers.

As suggested by the psychologists, I maintained a gender balance in the study. There were 5 women and 5 men, representative of all age groups, as follows:

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-29</td>
<td>1</td>
</tr>
<tr>
<td>30-39</td>
<td>4</td>
</tr>
<tr>
<td>40-49</td>
<td>3</td>
</tr>
<tr>
<td>50-59</td>
<td>2</td>
</tr>
<tr>
<td>over 60</td>
<td>1</td>
</tr>
</tbody>
</table>

The interviewees were mostly Europeans, and I conducted interviews in Switzerland. But only six people were resident in Switzerland; two came from Germany and one from the United States. Only three respondents were of Swiss origins. One had double citizenship: Switzerland-Great Britain. One Croatian researcher lived in Canada and studied in Switzerland, and two Swiss participants lived in more than one country (Switzerland, Germany and the United States). One participant interviewed via
Skype was a Canadian living in Great Britain, and another Italian interviewee was living in Italy and the United States. I believe this represented enough diversity for a qualitative study.

Because of their work demands and career aspirations, the interviewees had to relocate from their place of origins or live and commute between two countries; some of them seemed to have no domicile at all. The interviews were edited and issued in the final artists-in-labs documentation (book and DVD).

In the next section, I will show how people who have to fly extensively for work develop similar behavioural patterns in the airport space. Mobile technologies allow them to treat airports as an extension of their workplace.

4.3 Behavioural Patterns and Procedural Map of Constant travellers

I divided the results of my analysis into five headings:

- Mobile work at airport (defining constant travellers’ workplace and travel patterns),
- Hybrid workspace (describing their set of work tools),
- Constant traveller profile (a set of attributes that define the constant traveller's personality),
- Behavioural patterns (a set of survival rules for constant travellers),
- Procedural map (charting the decision-making processes, activities and emotions of constant travellers during their trips).

Mobile Work at Airport

Interviewees revealed that work requirements and the mobile nature of their work were the main reasons for the frequency of their flights.

Reasons for Extensive Air Travel

For all those interviewed, the constant traveller lifestyle was strictly related to work. Although one constant traveller admitted "My career might not be the reason for my constant travel. It’s more a personal attitude that constructed my career." But other interviewees said that the fascination of air travel and spending nights in hotels disappears very quickly: "It’s fun the first few times but then it becomes a routine."

Travel Frequency

Often the frequency of flights is irregular and depends on project requirements. As one constant traveller told me: "Well, it depends from month to month. It can be two weeks a month, or it can be one week a month, but these are usually one day or two-three day trips. But it can also be very extreme. It is very irregular so it can be as extreme as last March: I was in the States for four days and a week after I was there again for three days." In contrast, another constant travelling investor rather
leaves for a longer period to focus on his task. He explained: "Then I was three weeks constantly on the road, for example, I started last week for the USA, six days long, we flew around. We flew during the nights and researched during the days. We looked at 30-40 objects." Another respondent, who is a manager of an EMEA region, must travel constantly to keep contact with branches in his region. He said that because of his responsibilities he has to visit these countries on a regular basis. Usually he is on the road four days a week and one day he works in his hometown office or at home. He manages four countries and has regular meetings at company head office in America. For him, face-to-face contact cannot be replaced by video conferencing, which is just a supplementary tool. But other constant travellers admitted that their personal relationships with clients make them fly even though there are company offices in these countries. In general, all explained that their travel intensity depends on project requirements, work to do at the location, or client needs.

**Work as a Field of Action, Mobility Patterns**

Moreover, constant travellers perceive their air travel as a field of action rather than merely commuting by plane. Their travel patterns may vary between project-related travel, routine travel or a combination of both. Although flight tickets are a significant expense related to mobile work, the main criteria for choosing the mode of transportation are related to access to the Internet and travel time and these factors often override the expense. For example, one constant traveller explained that the primary focus in planning his travel itinerary was work productivity without stress. So he never travelled by car, and he chose the train for connections under three and a half hours providing he had continuous Internet coverage and the opportunity to work in peace. Moreover, he argued that he often used his travel time more efficiently than at the office. Otherwise, he flew. In fact, for many constant travellers the space in-between destinations, becomes a space where they work. But they also describe this travel space-time as a time to overcome jetlag, perform daily activities, luxury time for themselves, space for self-reflection (offline in the aircraft) or, as one constant traveller described it, the "feeling of being in a bubble." It follows that constant travellers’ needs and expectations relating to mobility spaces such as airports are different from those of average airline passengers.

The workspace that provides an opportunity to use travel-time efficiently can be seen in the following diagram (Fig. 97):

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41 EMEA region - Europe, Middle East, Africa
The next category of the analysis was about hybrid workspace and how it affects constant travellers.

**Hybrid Workspace**

The necessary work tools for mobile workers are laptops, smart phones (voice, calendar, emails) and the Internet (Wi-Fi or hot spot) for keeping in touch with their virtual team and friends and family via email and social networks. In one case, an interviewee was communicating on his Blackberry (smart phone type with chatting function) while talking to me. He told me that because of his mobile lifestyle, constant contact with his back office was essential for managing his team. On Blackberry "you can see right away what runs at the back office, and I only make corrections", he explained. In 2008, this was noteworthy, but it is almost a banal statement in 2014. Then the avant-garde of mobile work practice was gradually to become commonplace. Constant travellers seem to be a valuable for any researcher, who wants to understand the future potential of mobile work and air travel. But airports are behind! They don not think about work style and agile workplace concepts!

Otherwise, smart phones are primary devices used by constant travellers for managing their emails. They also use remote access to their office servers via VPN to up/download their digital documents. Constant travellers, who were my respondents, usually have no fixed workplace in the office because they are most of the time on the road or work in other locations. They share an office desk with others, and they store their belongings in caddies or lockers. As one constant traveller explained, the docking station with keyboard, mouse and flat screen are almost a luxury in his office. Moreover, he shares his office with others as a meeting room when he is away. In general, most of the time they work on the
way, remote from the office. Their personal workplace fits in a suitcase, with the complete equipment they need for travelling.

One interviewed constant traveller proudly presented the contents of his bag with multiple plug-connector for each country, network cable, book to read, laptop and even portable printer. Moreover, these suitcases cannot exceed 10-15 kg weight to comply with airport carry-on regulations. These trolley type bags are mobile offices, "always ready to go", as one constant traveller emphasized.

Constant travellers work in a hybrid space. They need a high level of flexibility to work almost anywhere (3rd spaces: airports, coffee-shops, clients’ offices, etc.), as well as home (2nd space: home office), while they are outside docking workplace in the office (1st space).

![Diagram: Mobile Workspace, Codourey (2008)](image)

All interviewees agreed that although it seems a privilege to be flying to different countries, sleeping at nice hotels, visiting different cities and being paid to do so, for constant travellers it is a necessity. And as one interviewee summarized "the goal is to have work done before you reach home. Rather get home to sleep in own bed than in a hotel." Moreover, one young researcher admitted that she was constantly on the move between different institutions because her goal was to get a permanent university position and settle down in one place. But also then she would have to travel a lot to different conferences presenting her research if she wanted to succeed!

The next section analyses the character attributes that are required for such a work/lifestyle.
**Constant traveller profile (self-evaluation)**

All interviewees identified themselves as constant travellers and confirmed that not everyone could manage to work on the move. Flying around for work purposes requires a particular character and skills. Surprisingly, all interviewees agreed about the constant traveller personality. They sometimes used different descriptions, but they referred to similar character attributes. The following sums up their own self-evaluation:

The respondents saw themselves as passionate, independent, self-motivated, and self-contained. One older interviewee confessed: "I think it is a feeling of really wanting to be alone. And I mention this because, for myself at least – and I have discussed it with other people who are also hermits… Even as a child I wanted to be alone. I loved playing alone, doing things alone, reading alone… and this has followed me through life".

Moreover, they discussed themselves in terms of constant traveller who does not like daily routines and love constant changes and challenges. The interviewee who is investing insurance money in real estate worldwide admitted that if he did not have to manage his back office he would travel 100% of the time. Because most of the time they visit different countries it is important that this person is flexible, curious, open to cultural differences and the unknown, and interested in other people. One person I interviewed answered as follows "Curious, being curious! Curious, not pedantic! If everything needs to be pedantically perfect i.e. if you pedantically need your comfortable bed, this does not function." But it is still important that the constant travellers is self-disciplined, has good management skills and the ability to work under pressure. Of course, language skills are also essential for working in different countries.

![Diagram: Personality profile of constant traveller as they represent themselves, Codourey (2008)](image)

But how one can survive such a lifestyle?
Behavioural Patterns (Survival Rules)

To overcome burdens of work and air-travel, interviewees developed similar mobility strategies:

- **To prioritize and optimize.**
  
  Learn to say "no" to immediate requests and adopt 2 hours response time. Most constant travellers try to be very disciplined. Although, their routines may not be exactly identical, they are very conscious about prioritizing. For them, it is important to optimize their agenda regularly, develop habits for checking emails (mostly on the road) or apply “2 hours response time” to phone calls. They also carefully analyse every aspect of their trip – “pressure test every travel” as one of the interviewees said: if they can work around it, combine it with other trips, or ideally avoid it altogether.

- **To avoid jet leg (work around it or take a pill).**
  
  Interviewee's trips are often in different time zones, so they have to deal with biological issues of sleep rhythm. Many constant travellers get around it by the way they schedule their itinerary. For example, one woman told me “Well when I go to the States it is usually two days or three days, and I try to stay on the European time zone more or less. And I fill up my days, I start meetings at 7 am to 6/7 at night and then I go straight to the airport and usually I fall asleep before I take off.” She believed that part of it was mind-set and self-discipline. Others are more practical and take jetlag drugs like Melatonin.

- **To watch life-balance (efficient travel time = more free time afterwards).**
  
  Travel for work is very time intensive, so the primary focus for constant travellers is to plan their activities efficiently to finish work activities before they arrive home. This means managing themselves and their time carefully and using travel time efficiently (e.g. only direct flights, work in transit and on the plane, pre-arranged meetings).

- **To pack lightly to minimize travel time (by taking only carry-on luggage you avoid waiting time at luggage drop-off/ pick-up).**
  
  As mentioned above, constant travellers have their carry-on luggage that is their office. Moreover, they try to reduce their luggage so that if possible nothing goes in the hold. Otherwise, there is too much hassle or delay in the event of baggage loss.

- **To eat regularly.**
  
  Diet is critical because constant traveller have irregular meal schedules while changing time zones. Also, airline food is not very healthy. So constant travellers pay attention to what they
eat and in some cases even carry a healthy snack with them.

- Don’t drink alcohol while travelling (it makes you tired). Consumption of alcohol during travel is an absolute taboo for many constant travellers. They are aware that their body is under so much pressure due to air travel (altitude), different cultures and irregular sleep. One interviewee was convinced that despite his age (50) he could dance last night for two hours and fly today to Switzerland in the morning and sit with me fit and relaxed just because he did not drink alcohol.

- To exercise (on-the-road, no fixed schedules). A large downfall of constant travelling is no fixed schedules for training. Because they lead an irregular life it is impossible to commit, for example, to yoga class on Wednesdays, or a dance course on Fridays. They have to work around this by always arranging exercise on the road, in hotels or with a personal trainer who is willing to adjust to their irregular schedule.

Fig. 99. Diagram: survival rules of constant travellers, Codourey (2008)

The next step of my analysis was to map the decision-making processes, activities and emotions of constant travellers during their trips.
Procedural Map

Fig. 100. Procedural map, Codourey (2008)

Constant travellers take four distinct steps to accommodate air travel into daily business:

- To work and arrange flight and travel itinerary.
  Avoiding travel is a priority for most constant travellers, and success is measured by finding a solution around it.

- To decide on means of transportation.
  Here again, the priority is opportunity to work during travel and Internet access, so they are
more likely take a train if travel time is under 3 hours. Otherwise, they always choose a direct flight to the destination. Car is considered the most unreliable way to travel, because of traffic and missing the opportunity to work. This step is very intensive decision-making process that requires good self-management and prioritizing skills.

On an emotional level at this stage, workers are under pressure and focused. This decision-making process may also be very stressful or partially exciting ("on adrenaline" as one woman described it): “Because I have family and a husband who is also travelling I really pressure test every single travel step. Can I not do it through phone or WEBEX or the video-conference? And really if I can't do it then I travel”.

- To go through airport thresholds.
Check-in procedures, security and pass control are routine for constant travellers. Most of them either have done their check in on the web or use the automatic check-in stand in the airport. They are familiar with every step of the airport procedure and just go through as quickly as possible. Also pass controls are about emotional indifference for these business and professional travellers. But security controls are a major obstacle for their efficiency. They are irritated and annoyed about constantly adding security regulations and long queues. Some try to ignore it and just develop strategies for choosing the fastest lane, others constantly challenge security staff and show their annoyance.

- To work airside and on the plane.
When they pass all controls they usually go straight to the gate and work while waiting for boarding. They might do the last email check or telephone; others would rather read a newspaper, research paper or book. It is also a good moment to maintain contact with family and friends on social media. Not many constant travellers go to the lounge because they find these lounges most of the time overcrowded or too far away from gates. Some simply just prefer to work in the airport café or restaurant. Most of the time they enjoy being on their own and without everyday interruptions. This is the perfect time for contemplation and self-reflection. Although, most of them said that the priority was to work at the airport itself.

- To arrive, meet and work at the destination.
When they arrive at the destination – the primary concern is to get off the airplane as quickly as possible. Therefore, they prefer to sit in the front row of the plane to avoid even smallest delay. If it is their first time in town, they will take a taxi to the destination. Usually, all meetings are arranged, business dinner or a short chat with an old friend or visit the local office hub to work and chat with work colleagues.
Constant travellers do not consider their work/lifestyle to be necessarily a privilege or fun. One of the interviewees explained: "I think its just part of the work, and I don’t think it is particularly fun, but it doesn’t bother me in the sense that I take the airplane like somebody else takes the bus. But I think you need to be very disciplined [...] so you can do the swaps without losing time. [...] Those travels I am not sightseeing." Although they admit that this kind of job gives them satisfaction, it may be only a phase in their life: "If I didn’t travel I think I wouldn’t miss it at all. For me, it's with people, working with people, moving things along, that makes me tick and makes me get up in the morning and look forward to going to work. It’s not that I need to travel. It’s just because I work in a global company and people I work with are all over the world that requires me to travel".

Conclusion
As a result of both these studies, behavioural research became an essential tool/method for analysing the decision-making patterns of constant travellers and mapping their activities – see the procedural diagram of that airport flow-space (Fig. 101). Although I have used interview techniques before, this time it was different because I approached it in a more empirical way:

- I knew how to approach people (how to contact people, how to approach them and make them interested in my research) and my collaborators at HCI Lab were surprised how fast I found international interview partners.
- I have learned how to structure open questions, and benefited from the collaboration and psychological expertise of my collaborators (esp. behaviour and emotions aspects of my research).
- I learned about constructing qualitative interviews. Today, this new skill supported by previous experience gives me confidence in conducting interviews as a practical workplace consultant – of which there are not many in the field of architecture and design. Interviews are essential for understanding the needs and desires of the target group, and good listening and analytical skills bring results on a scientific level rather than just creating a wish list. This method informs design that responds to the actual needs of users.
- Results of qualitative interviews are a good basis to construct solid questionnaires and confirm my thesis on a quantifiable level.

4.4 Study 2: Quantitative Survey

Quantitative Survey (Design of Questions)
Based on gained knowledge about constant travellers in Study 1 I was able to design an on-line survey to check for specific indications of constant travellers within the overall group of air travellers.
I designed 17 specific survey questions under the supervision of scientists from the University of Basle, and evaluated the results using statistical analysis of quantitative data with SPSS\textsuperscript{42} software.

**Design of Questions**

To get the desired results, I formulated short, clear questions. For optimal results from the SPSS software, I used a preference scale and formulated questions accordingly. These sought to determine whether the constant traveller type exists. I also used some direct questions to determine whether information gathered in interviews with constant travellers was comparable with answers from constant travellers who participated in the on-line survey.

**Structure of Questionnaire**

(1) – *Assessment of traveller type*

It was important to distinguish traveller types for good questionnaire design. Two questions elicited information on people’s travelling style and frequency.

**Q1:** Which of the mobility patterns described below matches your travelling style? Select one:
- Event Traveller,
- Package Tourist,
- Transnational Lifestyle,
- Enforced Cosmopolitan,
- Constant Traveller,
- Other
- I prefer not to answer.

**Q2:** How many trips per year do you usually make? (Please specify)

(2) *Scale 1-7 questions*

I designed the following questions for statistical analysis of information to assess the importance of various travel factors and emotions:

**Q3:** How important are the following factors for your travel:
Cost, time, Internet access, access to selected airport lounge areas, power supply to recharge your mobile devices?

**Q4:** During travel: How often do you feel the following: stress, impatience, loneliness, excitement, boredom?

(3) *Multiple choice questions*

\begin{footnotesize}
\end{footnotesize}
The multiple choice questions were designed to compare information gathered from qualitative interviews and this survey. These questions were:

Q5: How do you use/understand your travel space-time?
   - Space in-between destinations
   - Wasted time, extension of office space / work time
   - Incorporated into everyday activities / efficient time

Q6: During travel: What mobile devices do you use?
   - Laptop
   - Mini laptop
   - Cellular phone
   - iPhone
   - PDA (Blackberry etc.)
   - Portable media player (iPod, mp3 etc.)

Q7: During travel: What do you use your mobile devices for?
   - Voice communication (telephone, Skype, etc.)
   - Email
   - Social networking (Twitter, Facebook, Flickr, etc.)
   - Multimedia entertainment
   - Internet surfing
   - Network access (VPN etc.)

Q8: If delayed how do you spend your time at the airport?
   - Sleeping
   - Shopping
   - Eating / drinking
   - Entertainment
   - Working
   - Relaxing / contemplating

Procedure
To gather the required data, I decided to administer this questionnaire over the web. So I designed the interface as on-line interactive project instead of a simple survey. My aims were:

- To make it more attractive and to motivate potential users to complete the full survey (minimize drop-out ratio),
To give the participant access to view records and browse through date record (data were anonymous),

To generate artistic reflection on data collection as a research instrument,

To provoke reflection on the biometric border – through a technology that at that time was creating huge databases of mobile identities.

**Survey as an Artistic Intervention**

In August 2008, I was invited to participate in a partner exhibition entitled “Lucid Fields” at the International Symposium of Electronic Art (ISEA) in Singapore. I used this unique opportunity to test the interactive interface I had designed for the questionnaire on constant travellers. I called this installation a “Data Record of Mobile Identities”. At the same time, ISEA was an opportunity to gather information from these exhibition visitors about their travel patterns. Artists and other mobile workers had gathered in Singapore from all over the world. The installation was accessible on-line (http://mobile-identities.info) as well as at the exhibition.

The following introduction was provided:

The Data Record of Mobile Identities is part of a science-based investigation into modern mobility and the psychological conditions of travellers in transit. The aim of this research-in-progress is first to establish if there are any significant differences between the behavioural, cognitive and emotional states of different traveller types (mobile identities). From an artistic perspective, the objective of this Internet-based project and installation is to create a database of mobile identities and draw attention to issues pertaining to the classification and potential surveillance of mobile subjects based on biometric authentication with database inscription.

Visitors were requested to participate voluntarily and anonymously in the survey and project. Those who agreed were then invited to enter their traveller profile into the databank by filling out a “travel
form”. Participants could skip any question they did not want to answer by choosing the “I prefer not to answer” button. At the end of the questionnaire, I asked participants to take a photo of their eye that would serve as their travel form icon. For those who wanted to re-edit their travel form I gave the option to set up personal access to their data. I made results of this questionnaire visible at any time via website interface. In this way, participants were able to browse the result of the questionnaire at any time and filter the information by subject or question.

The interactive installation / on-line project “Data Record of Mobile Identities” is a part of on-going science based investigation to assess emotional, cognitive and behavioural states of travellers conducted by Monika Codourey during her Swiss artists-in-labs 2008 Residence.

From an artistic perspective the objective of this installation is to draw an attention to issues pertaining to the classification of mobile subjects and concepts of new surveillance based on biometric authentication with database inscription.

The visitors are kindly asked for their voluntary participation in the survey and the project by filling out a “5 minutes Travel Form” consisting of 17 multiple choice questions. These questions are about traveller’s mobility pattern, use of mobile devices during travel, their perception of the airport space and in particular their experiences at the security/border controls. An anonymous Data Record Card is generated based on the filled-in form and can be viewed in the public data record.

The research/artist ensures confidentiality of the participant’s identity and data throughout the conduct and reporting of the research. The participant can change and withdraw from the project at any time by editing or deleting his/her data. (access code will be assigned).

Monika Codourey

Fig. 102. Interface: Data Record of Mobile Identities, http://mobile-identities.info, Codourey (2008)
Results

I conducted the data collection for this on-line survey between July-October 2008. Data were collected in two different contexts:

- Exhibition at the electronic media art festival ISEA in Singapore (cultural context),
• Database of volunteers used by the Institute of Psychology for their surveys (scientific context).

I wanted to find out which context was more appropriate for gathering data about constant travellers. I was not convinced by the psychological explanation that the context of the data gathering does not affect results. I used two methods to compare the results. Because my intention was to gather data about cultural aspects of air travel, about constant travellers, I wondered if the context would, in fact, impact the results of the survey.

Data Sample Collection at "Lucid Fields" Exhibition Singapore ISEA
The on-line survey (http://www.mobile-identities.info) was introduced at the "Lucid Fields" exhibition. In a period of nine days I gathered 75 entries from people visiting the exhibition. The diagram below (Fig.105) shows visitors’ activity on the Data Record of Mobile Identities online survey.

Fig.104. Screenshot: Website Statistics for July 2008, the diagram represent the intensity of page visits per day.

Data Collection from Volunteer Database / Mailing List
In October 2008, I sent out a standard request for participation in the online-survey to volunteers from the Institute of Psychology at the University of Basle. In this case, 60 people responded within two days. The diagram below (Fig.108) shows their activity on the Data Record of Mobile Identities.
Discussion

The main goal of the survey was to test if it was possible to distinguish constant travellers from other air-traveller groups. I asked participants to self-assess their mobility patterns according to the given description and classification (see below). Analysis then concentrated on examining if participants who declared to belong to the constant traveller group had different behavioural patterns from other air-travellers. In the end, the aim was to compare information gathered during qualitative interviews (Study 1) with constant traveller answers gathered from the on-line questionnaire (Study 2).

(1) Self-assessment of traveller type

First travellers were asked to choose which mobility patterns matched their air-travel habits. Only in this way was it later possible to determine which answers belonged to which group of travellers. The second question was about frequency of travel for business and private purpose within a year.
Out of 135 entries, 69 participants declared themselves to belong to the event traveller group, 11 perceived themselves as package tourists, 22 claimed to lead a transnational lifestyle, and 20 identified themselves with the term constant traveller. There were no participants who declared to belong to the enforced cosmopolitan group. Only 7 participants defined themselves as not belonging to any of these groups. Some of them claimed that they belonged to two groups (e.g. event tourist and constant traveller). 6 participants preferred not to answer this question. A total of 13 participants were excluded in the analysis because they declined inclusion in any of the traveller types listed.

Fig. 106. Screenshot: Traveller Types, Question Q1; which mobility pattern described below fits you best? Codourey (2008)

Fig. 107. Screenshot: Answers to question Q1 of the survey.
(2) Comparison of travel frequency

Participants were then asked to estimate their average number of trips per year for business and private purpose.

![Screenshot: Travel Frequency, Question Q2: How many trips per year do you usually have?](image1)

The table below shows mean value of business air-travel for constant travellers. This averages as 26.68 trips per year (min.2, max. 120), which is significantly more than the transnational lifestyle group with 14.9 trips per year (min1, max. 70), event travellers with 6.62 trips per year (min1, max. 70), or package tourist with 5.27 trips per year (min.1, max. 35).

![Screenshot: Answers to question Q2 of the survey.](image2)
Conclusion
The quantitative survey indicated that constant travellers could be defined as a separate group of air travellers who travel for work purposes.

This quantitative survey indicated that constant travellers could be declared to be a separate group of air travellers who travel for work purposes. There is no significant difference in travel frequency between event travellers (69 participants) and package tourists (11 participants), so these two groups could be combined into one tourist group (80 participants) for this particular study.

For the SPSS analysis of combined traveller types the following groups were compared:

- Tourist – 80 participants,
- Transnational lifestyle – 22 participants
- Constant traveller – 20 participants.

Total participants analysed: 122.
Significant characteristics of constant travellers

(1) Multi-nationality

Most constant travellers answered that they had more than one passport: the mean was almost 1.6. The transnational lifestyle group declared an average of 1.28 passports per person, and tourists slightly under the 1.2 passports per person. Although multi-nationality does not determine a person’s air-
travel status, these studies indicate that most constant travellers have more than one passport (see results of Study 1).

Fig.113. Diagram: Combined Traveller Type and Mean (Number of Passports)

(2) Half of the travellers (50%) who identify themselves in the survey as constant travellers use their travel time for working. For them, it is an extension of their office.
(3) The majority of travellers (70%) who identify themselves as constant travellers work at the airport in the event of flight delay.
(4) Lounges are less important for many travellers who identify themselves in the survey as constant travellers.
(5) Many travellers who identify themselves in the survey as constant traveller found power supply & Internet access as factors important during their air travel.
(6) Constant travellers use smart phones and laptops during air travel more often than other travellers.
(7) They use these mobile devices for network access (VPN), emails and social networking.

The use of questionnaires for sample data collection and application of descriptive statistics in my research suggested the following conclusions:
• The context of data gathering is important. Using the volunteer databank of HCI Lab, I received feedback from 60 participants within two days. On the other hand, gathering results from 75 participants in the exhibition context took longer, about five days. But participants in the exhibition context represented greater diversity, and I received majority responses from participants who declared to belong to the constant traveller group. In this case, using only the volunteer databank for the survey would have led to substantially different results.

• The survey results indicate that it is possible to distinguish constant travellers from other groups of air-travellers. Their needs and behaviour are different from those of others.

• The descriptive statistics do not address questions of cause and effect. In this case the quantitative survey can only serve to verify information gathered during in-depth interviews with constant travellers. Accordingly, this survey was designed to determine whether the behaviour described applied to all air-travellers types or just to constant travellers.

• The preliminary analyses drawn from descriptive statistics could have been developed further if I had designed the research questions with reference to inferential statistics – i.e. relying on sampling theory rather than description (e.g. correlations between behaviour, purpose and travel frequency). However, this was not the primary focus / research question of this thesis/study.

• The empirical part of the study was completed in 2008. At that time, mobile work was not so popular as it is today. In fact, it was almost unknown to the majority of people. Writing in 2014 – the results are still valid not only for constant travellers but for a larger group of knowledge workers.

• The collaborators from HCI Lab were not only impressed by the way I constructed the questionnaire with their support, but also how I managed the results from the quantitative data that substantiated the results from the earlier qualitative research. They judged these results successful from a scientific perspective. Moreover, I enjoyed the application of methods borrowed from psychology. I learned how to work with scientific methods, but, more importantly, this analysis gave me confidence about my constant traveller thesis.

Summary for Chapter 4

The results of this research helped me to formulate a set of questions that could address the needs of constant travellers. How can designers improve the air travel experience and help constant travellers to:

• Move fast through airport thresholds (security burdens)?
• Work efficiently while in the airport space outside lounges (power + internet)?
• Overcome feelings of solitude (need for co-existence but also time for “self-reflexion”)?
• Feel like in their (home) office while flights are delayed?
• Maintain a healthy diet (eat healthy food regularly)?
• Maintain fitness (regularly exercise)?
• Manage stress better (more choices)?
• Maintain a viable life-balance (efficient work time = more free time afterwards)?

The aspects in which the results might inform design strategies to improve the work and air-travel experience of constant travellers are:

• EFFICIENCY (speed and quality of work),
• EMOTIONS (solitude and comfort),
• HEALTH (balance, diet and exercise, stress, jet-lag).

Therefore, in the chapter 5 I will show the potential impacts of this research on design methodologies that hopefully give other researchers ideas for practical applications in the future.
Chapter 5
Design Strategies to Improve Work and Airport Experience for Constant Travellers

My research has led me to construct the following set of design strategies with the hope of improving the airport experience of constant travellers. My aims are:

- To develop strategies that improve the emotional status, health and work efficiency of constant travellers, and to compare these strategies with other developments in the hybrid airport workspace,
- To focus on three specific questions in relation to these strategies:
  - How can we create an airport experience that helps constant travellers feel less solitude and more community in transit spaces and other mobility environments?
  - How can we meet the needs of diet, exercise and stress management in these spaces?
  - How can we turn mobility environments into better quality workspaces that support work efficiency and community engagement?
- To examine other applications and designs that aim to accommodate work and travel.

In this chapter, I will show why I have focused on these particular issues of emotion, health and work efficiency. I will adduce case studies indicating that solitude, comfort, balance, diet and exercise, stress, and the avoidance of jet lag affect the speed and quality of mobile work in airport space. The chapter is divided into four sections, where I examine strategies of emotional design (including my case study of Paxman 2.0), improving conditions (including a Travellers Guide to Smart Air Travel), locative space, and design (including my residency at Blast Theory in the U.K). I will conclude with observations on the relation between my own experience and the physical and digital workspace.

In pursuit of these aims I developed a set of strategies to investigate the following:

- How methods from social sciences can help to generate better airport experience.
- How architects can use this approach for user-centred, holistic design of airport space at both the physical and virtual levels.

5.1 Case Study 1: PAXman 2.0 – Emotional Design

This section explores ways to improve the airport travel experience by using mobile media. Many constant travellers use social media to counteract loneliness while travelling (see interviews and questionnaire results). While the most obvious way to address any feelings of solitude would be to offer synchronous communication, asynchronous communication offers a unique opportunity toward documenting the feeling of solitude. From the design perspective a number of questions arise:
• To what extent do social media and mobile phone technologies distance workers from their immediate physical space?
• How would a pervasive game component help reposition and re-embody these workers in the airport space?

Fig. 114. Airport advertising often reflects the interests and needs of target group travellers. In this particular case a Vodafone Advertisement at Manchester Airport urges: “Get your friends together and throw a phone warming party” (Photo: Codourey, 2011)

Intervention in Airport Code/Space with Mobile Devices

British human geographers Rob Kitchin and Martin Dodge have examined software from a spatial perspective and analysed the relationship of software and space. The production of space, they argue, is increasingly dependent on software that "creates new spatialities of everyday life and new modes of
governance and creativity". (Kitchin & Dodge, 2011:16). They suggest that examples of code/space include networked offices, Internet cafés that are transformed into workspaces by laptops and wireless access, and airports. It would seem that designing mobile media applications for the airport could be an appropriate tool to help to change constant traveller’s perception of transit space.

The results of my multiple study research during the AIL residency at the Institute of Psychology HCI Lab (University of Basle) confirmed that constant travellers are connected to airport code/space using mobile devices such as smartphones, tablets and/or laptops. On this basis I developed a design for intervention in the airport area as a response to the airport experience described as "a hassle of going through airport thresholds and a feeling of being in a bubble or using social media to kill the waiting time in the airport" (see: interviews with constant travellers). The result, which I have called "PAXman 2.0", is a mobile-based application with a pervasive game component.

I started with the concept for PAXman 2.0 with the hope that well-designed mobile media might help address feelings of solitude by offering constant travellers a more affectual experience of asynchronous communication. In this light PAXman could be applied to three airport areas or contexts:

- Airside area (Schengen / non-Schengen, transfer or delay)
- Landside area (pre-flight / destination)
- Gates and lounges

Fig.116. Initial scheme for PAXman 2.0, Codourey (2008-2009)
The design was inspired by one of the first location services for frequent travellers called www.dopplr.com (2007-2009, London). Dopplr was available on personal computers and mobile phones. It allowed dopplr members to keep track of their own and each others movements, create itineraries of their travel plans and spot correlations with their contacts’ travel plans in order to arrange meetings at any point on their journey. They could also exchange tips on places to stay, eat and explore in cities all over the world. Later, dopplr offered a carbon offset program.

Dopplr sent out a "Personal Annual Report" to all of its users, showing users’ carbon footprint and travel statistics. Although some people had privacy concerns, this networking site was very popular.
for many travellers. Sadly the project did not continue after Nokia bought it in 2009 and the server was shut down in November 2013.

In PAXman 2.0 I have tried a different approach by offering a special tool to store messages in airport space and send them to specific friends or a community. Then only if you pass through specific hot spots in the airport would you receive these messages. The situation was thus a reversal to dopplr.com, in which human-to-human contact is not face-to-face but message-to-message contextualised in specific space. Moreover, this interface would allow constant travellers to inscribe messages (traces) into a particular airport space. Visual, verbal or text messages could be tagged to a particular location within the airport where the sender was currently waiting, and be picked up by a receiver who also happened to be in that space at that time. For example GPS-based traces could be:

- A "message in a bottle" to the PAX community,
- Reflections or thoughts written “on the wall”,
- Personal notes to a particular PAX buddy,
- Tips (good coffee place etc.),
- Comments on e.g. border and security controls (games they already play),
- Photos / videos / sounds tracing coincidental meetings.
Such asynchronous communication, which deploys all the reflective advantages of slow communication and this process, might create moments of deep sociality through reflective solitude for constant travellers.

I hoped this approach might improve the airport travel experience by adding a surprising moment of unfamiliar intimacy in anonymous place. Specifically, would it improve the stress of working conditions inside the physical airport space?

Another option would be to structure mobile-based intervention as a pervasive game\textsuperscript{43} that would allow the gaming experience to be extended into the physical space of airports. Many artists and game designers have been inspired by ubiquitous computing\textsuperscript{44} and have experimented with bridging physical and virtual space, reconfiguring the formal and social limits of games in relation to everyday life. An example of such a pervasive game is "Can you see me now?" (2001), created by Blast Theory, an artists group, in collaboration with the Mixed Reality Laboratory at Nottingham University. In this research, artists investigated the potential of the Global Positioning System (GPS) for competitions between on-line players and runners on the street. In this game, Blast Theory overlaid the physical city with a virtual city, exploring the novel idea of absence and presence while sharing the same space. By sharing the same "space", on-line and street players developed new ways to cope with the playful relationships and uncertainties of location-based wireless technologies.

I hoped that by introducing geo-locational game components to PAXman 2.0 it would make the application more appealing, because such games have less to do with winning and losing and more with the cultivation of social communities and human networks. But more importantly, I wanted to re-connect constant travellers in their actual physical space and change their behaviour and perceptions in the airport. Bill Buxton observes:

\textsuperscript{43} Pervasive or ubiquitous games are games that take place in a mixture of the real world and the virtual world of the game. In general, the gaming experience can be extended into the real world, or where the fictive world in which the game that takes place blends with the physical world.

\textsuperscript{44} Ubiquitous computing (ubicomp), and calm technology were terms coined by Mark Weiser around 1988 at XEROX Parc in California. He described ubicomp as the third wave in computing (after mainframe computing and personal computing), which informs but does not demand our focus of attention. Ubiquitous computing is also known as pervasive computing, ambient intelligence, or "everyware", each term emphasizing slightly different aspects. In general it is a concept where everyday objects and physical environments are augmented with networked computing functionalities.
For architects buildings are going to become increasingly active, and reactive, having behaviours that contribute as much to their personality as do the spaces, materials and structures that have defined identity in the past. (Buxton, 2007)

The following goals of pervasive games were investigated in relation to the design of the project:

- To augment the relation between physical space and social interaction,
- To explore the potential of an invisible layer of intervention into highly secured airport space,
- To layer of alternative reality on the airport space causing an experience of the design of the actual space,
- To focus on behavioural, experiential and emotional responses rather than object-centred design.

Fig. 121. Terminal City, Re-make of <<Naked City>>, Guy Debord (1957) with airport hubs and constant travellers. Codourey (2005-09)

Summary

The use of wireless and mobile technology as a design strategy to improving airport experience might help re-connect constant travellers in airport space. In this context, PAXman 2.0 could become a tool that enables constant travellers to feel less solitary and more belonging to a community of travellers, by creating moments of deep sociality. However, the project could only partially improve working conditions in the airport physical space because PAXman 2.0 was only designed as a reflective tool for travellers, and their priorities were more based on time factors.

Because I am an architect and designer and not a software developer, I was more interested in offering these facilities to programmers and other people who might be interested in taking them further – including constant travellers themselves. I was also unsure to what extent constant travellers would use this application. The results of my research showed that constant travellers do not play traditional computer games on their mobile devices. So the application was never made. However this research made me realise about interesting potentials for gamification.
5.2 Case Study 2: The Constant Traveller’s Guide to Smart Air Travel – Improving Conditions and Location Awareness

In this case study I will explore how the concept of location-based services\(^{45}\) for mobile phones might offer guidance to constant travellers during air travel, particularly when time is extended due to flight delays. The design interventions within the airport area, based on alternative activities (health, food, networking, socializing, eco-consciousness) and mobile technology, may contribute to improving work conditions in physical airport space. Four questions arise:

- What kind of assistance on mobile devices is important for constant travellers?
- What kind of social interaction is possible in the airport?
- How can social processes be designed with mobile media?
- How can the way we interact in the airport be changed?

My study of constant travellers revealed that these passengers do not enjoy the time they have to spend in the airport. For them, airports are just a necessity. Therefore, many constant travellers try to minimize the time spent in the airport and arrive at the airport shortly before departure. They also develop survival strategies for their travel realities (working, reading, using social media like Twitter or Facebook). But when asked what they would like improve at the airport, they had many interesting ideas for change (e.g. book club, possibility to work at the gate). Design strategies should, therefore, not only respond to the needs and wants of constant travellers but also create new situations as an inspiration for them to change their behavioural patterns.

![Image of travellers' emotional experience](image)

*Fig.122. Photo collage: Augmented image of travellers’ emotional experience. Codourey (2009)*

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\(^{45}\) Location based services (LBS) is a software application for mobile device that requires knowledge about where the mobile device is located. LBS mobile apps are used for example to finding your friends, track packages or mobile advertising.
In 2010 (15.02.), I also conducted an interview with Mr. Joost Greve, a manager for ground product development at SWISS Airlines Ltd., and discovered that airports, airlines and constant travellers have different interests in the kind of location-based services that might improve the airport experience. Mr. Greve explained that Swiss Airlines are developing mobile application with single entry points, where airlines can offer their services. Because the primary focus is on airline added value (speed of flow), he believed that only the following services on mobile devices were worth attention:

- Booking and managing flights,
- Mobile check-in,
- Timetables,
- Flight status notification,
- Access to miles programs,
- Mobile boarding,
- Seat reservations.

These functionalities do indeed elevate in some way airport experience because they assist passengers in airport booking, check-in and boarding procedures. These aspects of air travel are also the major focus of constant travellers. But such applications do not address the social needs of constant travellers during airport dwelling time.

![Fig.123. Screenshots: SWISS Airline app for iPhone, download available on iTunes, (2014)](image)

Mr. Greve admitted that some extended services such as applications allowing taxi sharing or city guides could also have potential. As can be seen from fig.126 some of these functionalities were in fact developed. However, many airline applications still have poorly designed interfaces and do not provide enough tools to passengers over and above these basic services. I have reviewed many mobile airline apps (2014) and found only a few examples that offer some other uses, such as:
• Travel Guide (Cathay Pacific) offering information about sights, dining, hotels, entertainment and fast facts about cities,
• Bag Tracker (United Airlines) to check if your luggage travels with you,
• Flight Tracker (Virgin Airlines) tells the position of your plane on the map alerts before landing and offers short videos about destinations,
• Parking Reminder (United Airlines) allows you to see the location of your car,
• Sudoku game (American Airlines),
• DING! Fare alerts (Southwest) for air and car reservations,
• Jet Lag Fighter (Virgin family of apps) helps passengers to reduce Jet Lag by helping to establish proper sleep,
• Flying without Fear app (Virgin family of apps) is meant to minimize fear of flying
• Trip Journal – does what the name suggests,
• Loyalty app (Quantas) uses augmented reality\textsuperscript{46} combining camera, GPS and compass to recognize an object or place that a user is pointing to with loyalty,
• Trip Shaker (KLM) helps the user select the place or date they want to travel to by shaking the phone for another option till they find the perfect match.

But these applications are mainly service oriented, and they do not include any potential for social communities. Greve pointed out the privacy concerns. Fears that some passengers may use such networks for dating purposes would limit passengers’ willingness to share their data any officials. Airlines have consequently restricted their social media presence to community building on Facebook and Twitter specifically for marketing. Nevertheless, I found two examples of apps that encourage passengers’ engagement with one another:

• Miles&More by Lufthansa – an application for mobile phones that allows Miles&More members to share their geolocation, arrange meet-ups, give and receive travel advice, and even share taxis.
• “Meet & Seat” by KLM (2011) – an application that allows passengers to choose seatmates based on their social media profiles. This web interface allowed them to see who is on board well before the departure of intercontinental flights. By connecting with their LinkedIn profiles, travellers can see other passengers’ profiles and can get in touch with interesting people and then meet them in reality at the airport, during the flight, or after the flight. KLM has argued that their passengers could in this way add new interesting people to their network while travelling with KLM. (http://www.wired.com/2011/12/klm-passengers-can-use-facebook-for-meet-seat/)

\textsuperscript{46} Augmented space refers to a group of technologies (GPS, wireless location services, surveillance technologies) - all about how data space overlay physical space with information.
According to the New York Times, the concept of "social seating" does not appeal to all passengers, it was likely to be an interesting option for business travellers or backpackers looking for travel companions, although even these travellers will not necessarily find this challenge worth the risk of disappointment. (http://www.nytimes.com/2012/02/24/business/global/selecting-a-seatmate-to-make-skies-friendlier.html?pagewanted=all&_r=0)

Mr. Joost Greve went on to explain that there was a conflict of interest between airlines and airports. While airlines wanted to have their passengers as quickly as possible at the gate, airports were interested in having passengers use airport facilities as long as possible. He suggested that the airport map might have a product that could unite the interests of airlines and airports. He believed that an augmented airport and context sensitive advertising in the airport would be a successful mobile app project.
In 2010, at the time in question when the interview was conducted, these technologies were very new, and airports were not ready to implement location-based services for mobile devices because of limited W-LAN access and high roaming fees (restricted use of mobile phones). But some airports were already experimenting with web 2.0 services such as, Twitter to alert passengers of changes to airport, weather and flight status, as well as with airport community pages on Facebook and SMS alerts. This kind of Location based services (LBS) guidance for constant travellers is based on an understanding of the location, the means in question, and the airport space itself. However, under these headings various specific requirements, assessments and augmentation must also be considered. In order to do so I will now outline the design concept for infusing the physical airport space with mobile technologies that I have called "The Constant Traveller’s Guide to Smart Air Travel". This aims to develop a set of scenarios for airport social space enhanced by location-based technology that could modify constant travellers’:

- Behavioural patterns within airport space,
- Cognition of airport space,
- Emotions (boredom, loneliness, irritation etc.).

Inspired by the potential of LBS on mobile devices, I envisioned a set of PAXman’s agents that would respond to needs and guide constant travellers throughout their end-to-end air travel process. Moreover, this concept addressed the needs and desires of constant travellers established from the survey as I described in chapter 4. PAX agents were classified as follows:

- Agents improving efficiency of travel.
  At the location, a PAXman agent would assist constant travellers in the decision-making process as to whether air travel was unavoidable. Another PAXman agent would assist constant travellers in optimizing their travel itinerary by arranging meetings with others, pre-planning airport activities, offering social activities at the airport or arranging plane seating with PAX of similar interests.

- Agents that measure travel impact and encourage well-being.
  These agents would monitor constant travellers’ health and fitness, offer a food planner, and monitor emotional experience and stress level. Moreover, a myEarth agent would monitor the ecological impact of air travel.

- Agents supporting social activities and better work efficiency.
  At the Airport, PAXman agents would enable “slow” communication with other PAX (See Fig.129). Another PAX agent would help arrange ad-hoc meetings (see Fig.130). Most importantly, a PAX agent would also help arrange social activities, such as co-working (see Fig.134) workshops, interests clubs (Fig.132) and fitness activities (see Fig.133).
• Agents augmenting the airport.

These agents would give an overview of current activities for constant travellers, provide an emotional map of other PAX (Fig.124), and even explore the potential of airport “open data” streams.

I also visualized a set of situations that would change constant travellers’ airport perceptions and humanize the airport dwelling experience:

• A tagging game would allow communication with other PAX users by leaving “slow messages” at intelligent seats in the waiting area. Here one could leave a message addressed to a person to be picked up upon arrival.

• Ad hoc meetings with other PAX users may be possible by using a mobile app while waiting in the transit area for departure. Users would post information about the time they have before departure, the activity at the airport for which they seek a companion (e.g. restaurant, café), and common interests.
I was not sure that these social activities tools would necessarily improve air travel experience for constant travellers.

Another possibility might be to offer various workshops for exchanging know-how, for example, cooking class, Mac OS workshop or book club, as one constant traveller suggested. These would allow constant travellers to integrate their free time activities into their travel itinerary and improve the airport experience.
I also wondered how perception of the airport would change if mobile media could help constant travellers subvert some part of airport physical space into, for example, a jogging track. This strategy would offer constant traveller fitness activity on-demand. But how would other passengers react to such changes? Would it also encourage them to exercise? Fitness is very important for maintaining well-being. Recently, Gensler Architects recognized the passenger’s need for exercise during air travel. They designed the “Zen Room” at San Francisco Terminal 2. This new airport amenity is an indoor space equipped with yoga mats and dim light. This exercise zone free from shoes, noise and mobile phones is free-of-charge to passengers in the transit zone.

Inspired by constant travellers’ need to work near a gate, I also envisioned a potential scenario for the airport to assign areas for co-working groups. This concept would offer constant travellers a place to work but also an opportunity for spontaneous exchange with other co-workers. But this concept would also require design intervention in physical airport space to provide appropriate furniture, power supply and Internet access.
Summary

These location-based scenarios combine potential activities of constant travellers with various locations in the airport in the form of a media design strategy that adds social activities and integrates everyday needs into airport space, thus combating feelings of solitude, health and the ability to work. This strategy helps people locate facilities that already exist, improves travel efficiency, and gives customized feedback about travel impact on health and well-being by monitoring the activities of constant travellers. But it does not yet improve the comfort of physical airport space. As an architect, I was not interested in designing an interface for location-based services. This approach could, nevertheless, be taken as an inspiration for a constant travellers’ design guide combining airline and airport services with a view to enhancing the airport experience for this group of air travellers. Further feedback from constant travellers would support development of detailed scenarios and an appropriately user-friendly interface.

In the next case study, I will explore potential agents that augment airport space and extend design strategies beyond enhancing the personal space of constant travellers.

5.3 Case Study 3: Local Connect / Think Delay - PAXman 3.0

By accommodating the needs of constant travellers (local connect / think delay) design strategies based on various mobile media solutions can help determine what issues should be addressed, and thus improve the air travel experience of constant travellers. My question in this case study was: How can multi-sensory experience be endowed with new meaning in physical airport space?

As already discussed in Chapter 2, wireless technology is changing the way we interact with mobile devices during air travel. Today, passengers interact with automated services such as check-in, boarding their flights using QR tags or near field communication (NFC) boarding passes, and even
baggage drop using their mobile devices. Moreover, many airports provide wayfinding apps to help passengers to get around the airport. Besides navigation support (current location, find direction to desired destination), these apps allow passengers to receive information about their flight and gate status through push notifications. They also provide airport maps and information on facilities and services (e.g. shopping and eating guide). And, for example, the “360° wayfinding” app for Copenhagen Airport and the Narita Airport app allow the passenger to view terminal buildings in three-dimensional augmented reality (3D mobile wayfinding). In brief, these apps claim to be the passenger’s pocket travel buddy, personalizing the airport experience.

Fig.132. 360° Copenhagen Airport: This first 360° wayfinding navigation app available on PC and smart phone allows passengers to map in 3D their entire journey from current location to destination. (2014), (Source: http://www.futuretravelexperience.com/2013/04/copenhagen-airport-unveils-first-360-degree-wayfinding-app/)

But also third party developers like Google (indoor street view – available in 16 airports as of 2014) or Tripchi (http://www.tripchi.com/ – recommendations of things to do at the airport) have also developed apps for airports, so airport experience need not be defined only by the airport or airlines but also by technology developers. Moreover, new business ideas will also contribute to redefining that experience. For example, B4 YOU BOARD app (http://www.hmshost.com/airports/mobileapp2/) allows passengers to order their food for delivery at the gate by airport restaurateur HMSHost in US airports. But of these apps do not open up much potential for any alternative meaning of the airport space. In this sense, understanding constant travellers’ experience and requirements, and collaboration with airport architects and designers, might help infuse airport physical space with further multisensory experience.
Fig. 133. Tripchi, a third party airport app for finding and exploring restaurants, shopping, deals, unlocking airport secrets, meeting with friends and receiving personalized recommendations. (2014)

Fig. 134. B4youboard app – Service for stressed travellers who want to eat their food at the gate or take it on board (2014). (Source: http://www.hmshost.com/airports/mobileapp2/)

The Blast Theory residency

Now, I will explain why I applied for a Blast Theory residency to develop design strategies to elevate the airport experience for constant travellers by subverting their needs.

Blast Theory is a group of artists researching the potentials of mobile media in mixed environments. They create ground breaking new forms of performance and interactive art that mix audiences across
the Internet and urban space. In their projects, they have experimented with live games played simultaneously online and on the streets (Uncle Roy All Around You, 2003), combined theatre performance, gameplay and cyclists on the streets around the city (Rider Spoke, 2007), and they have used interactivity as a lens for engagement and shifting subjectivity (Ulrike and Eamon Compliant, 2009).

In 2010, I applied for a new model of residency initiated and run by Blast Theory artists, called 20 Wellington Road Programme. The program aimed to provide a space for residents to research and develop new work in a supportive and collaborative environment. This residency was a great opportunity to further my research and practice and learn from their experience, knowledge and working methodologies in an open and dynamic dialogue. Moreover, I believed that the mentorship and advice, as well as insights into Blast Theory practice, would be essential for my PhD research on new inter-disciplinary methods and design approaches for architects and HCI designers.

The main questions that I wanted to explore during the residency were:

- How can mobile technologies create meaningful experiences of the airport / airline space as well as add value to constant travellers everyday experience?
- How can behavioural studies about constant travellers form new approaches to the design of mobile and social technologies inside the airport?
- How can the actual territory of the airport be seen as a new social space?

My research focussed on situating human-computer interaction architecturally, where a more people-oriented approach was necessary – meaning an approach geared (in this instance) to constant traveller’s everyday needs rather than their imagined wants. To achieve this, behavioural studies have to be applied to the development of more appropriate mobile and social technologies for the target group. This alternative approach to research and design of an interactive environment based on mobile ICT is only possible with inter-disciplinary input from art, science and technology.

Before developing further design strategies, the kind of multi-sensory experience appropriate for constant travellers had to be determined. The main question was how to reconfigure their feelings of solitude, boredom, fatigue (delays) and annoyance (security checks and queues, overcrowded planes and lounges). How to change their attitudes of disconnection (passing through the airport without thinking) and cocooning (being "in a bubble") towards airport space, and their desire to be separated from other travellers?

These design strategies may not sufficiently create new multi-sensory experience although it could elevate their airport experience. What was needed was a design strategy that promoted the social dimension of the airport. Accordingly, I sought to create an environmental framework that would connect people behaviourally by creating a "sense of place" and local engagement. Social space is not necessarily only about talking to each other but also about creating a common space, common
concerns, co-existence, participation, and community. I therefore focused on the following design strategies that would help change constant travellers’ attitudes to dwelling in airports:

- Location awareness – to make constant travellers aware of the ambivalent realities of the airport territory,
- Participation – to encourage engagement of constant travellers in shaping the future airport territory,
- Changing behaviour – to support smarter ways of air travel.

In agreement with American interaction designer Dan Saffer, "designing a product for everyone, everywhere, for all the time is not realistic" (Saffer, 2009) and my design approach (Fig.136) was developed for constant travellers who travel for work purposes and frequently visit particular airports. These strategies would help constant travellers bridge the gap between their local and global everyday activities and involvement. But when and where in the airport would these strategies apply? To answer this question I created the map below (Fig.137) that illustrates existing activities and procedures within the airport territory.
Fig. 136. Map of airport territory and airport flow activities. Codourey (2010)

While design strategies for changing behaviour could apply for the entire air travel process, location awareness and participation could be implemented only in periods of delay and dwelling at the airport. My aim was that constant travellers should become active participants rather than consumers in the airport space, because they inhabit these spaces in a different way from tourists. For constant travellers, the airport is an extended workplace. These strategies could also be of benefit to airports and airlines by creating a better air travel experience for their key customers. The interface for implementing these design strategies could be an airport navigation app on a smartphone. But before actually designing this, the following questions had to be addressed:

- How to convert a mobile navigation utility app into a participative performance that helps to raise awareness, engage participation and change of attitudes towards the airport surroundings?
- How to construct a multi-sensored space for public dialogue?
- How get the target group interested in current airport developments and their impact on society and the environment?
Airport Territory as Interface

- How to motivate constant travellers to get involved in shaping public space as a future urban form?
- How constant travellers might impact on-going airport development towards a socially responsible and sustainable environment?

Results

In this section, I will look at the influences of this residency on the design concept of PAXman 3.0. I will also outline how a mobile-based application enhanced with location-based technology and augmented reality can create multi-sensory experience, embedding in it a new sense of the airport as social space.

I was inspired by a Blast Theory project called "Ulrike and Eamon Compliant" because this project combined mobile phones, guided walking and interaction with game elements such as narration, storytelling, emotional experience, reaction and decision making. In this real game project created for the Venice Biennale, visitors were invited to interact with artists on their mobile phones while walking through the alleys and squares of Venice. But the focus of this performative artwork was political engagement and moral certitude rather than the city itself. Here, urban space was just a set design for emotional experience through narration and the shifting subjectivity of visitors asked to choose between Eamon Colling, a member of the IRA and Ulrike Meinhof of the Red Army Faction. The potentials of this kind of interactivity and multi-sensory experience could be explored as a design strategy to change constant travellers’ attitudes.

PAXman 3.0 attempts to redefine traditional airport wayfinding and assistance apps by making sense of the airport territory, using the support of narrative interactivity. It converts the simple task of navigation from place to place into a process of getting familiar with the airport and engaging with issues around travel space. As one can see from the diagram below (Fig.23), PAXman 3.0 welcomes the constant traveller with the question "Where would you like to go today?" informs him or her how much time is left before boarding and offers the following choices:

- Proceed to gate and wait
- Airport exploration,
- Do-it-yourself (DIY) exploration.
"Local Connect / Thing Delay" offers other kind of navigation experience for mobile devices. It is a participative walk-through experience guided by narration. The content of these walk-throughs and level of interaction depend on what initial choice the constant traveller makes. People who are in a hurry to proceed to the gate are led directly to their desired destination. In this case, PAXman 3.0 offers only brief exploration or virtual exploration while sitting at the gate. Airport exploration enhanced by augmented reality (AR) offers, for example, secret stories of the airport, local history and culture, or short facts and figures according to the selected theme. PAXman 3.0 also engages travellers with issues of airport development, improvements and their impact on socio-spatial mobility. In addition, the Twitter stream displays travellers’ views, positions and ideas for change visible on interactive flat screens placed in arrival corridors of the airport. For more advanced constant travellers, PAXman 3.0 offers DIY explorations as material for an airport diary that can be shared with other community members.

It was a great opportunity to work on my project at the Blast Theory Studio. I could get insights into their work and benefit from feedback from Blast Theory artists themselves. This helped me think about my designs in terms of situated multi-sensory experience based on processes of local connection, thinking and delay mechanisms. I learned that engaging users with mobile media could improve interactions in physical space. I further developed my design strategy for constant travellers and came to the following conclusions:
• Combining mobile phones, guided walking and interaction can create multi-sensory experience imbuing airport social space with new meaning,
• Wayfinding apps combined with storytelling, reaction and decision making (interactive media art) can foster a sense of place and engage constant travellers,
• Focusing on the actual needs of constant travellers in airport dwelling space can change their attitudes and reconfigure feelings of solitude, boredom and fatigue with activities that go beyond shopping.

Because I am an architect, not an artist with performativity and visual art background, nor a software developer, I was more interested in offering my conclusions to media artists and airport managers, who can further explore how technology might be used to create new cultural spaces in the airport. As Swiss - Brazilian human geographer Francisco Klauser argues:

Airports cannot be reduced to “non-places” of consumption and mobility. They must also, more generally, be understood as complex and diverse, yet particularly commercialized, spaces in various forms of public use, which are not only in many ways treated like shopping malls but also as spaces for social encounters for various actors. (Klauser, et.al, 2008:108)

I believed that locative media artworks that create high participation, such as Blast Theory projects, should be included in airport space because they attempt to establish a hybrid social space. Moreover, airports already recognize the importance of art in the airport because of its calming and humanizing effect on passengers and contribution to sense of place. SFO Terminal 2 or the Museum at Schiphol’s Holland Boulevard exemplifies this argument. This design strategy needed further exploration.

My three case studies have concentrated on design strategies and dealt with issues of presence/co-presence, proximity/distance, interacting in mixed reality (case study 1) and locative based media (case study 2) to enhance the personal space and individual airport experience of constant travellers (emotions and health). Case study 3 has dealt with potentials of spatial narration, communication and exchange with other participants embedded in an airport as triggers of social engagement.

But for constant travellers the airport is an extension of the workplace, and the question remains: What design strategies can help to address this issue?

5.4 The airport as a Hybrid Workspace for Constant travellers – System Thinking

In this section, I will argue that only holistic design thinking leads to innovation and transformation of mobility environments that can help to create a better airport experience for constant travellers. The results of my studies, as discussed in Chapter 4, have shown that:

• 50% of travellers who identify themselves in the survey as constant travellers use their travel time to work. For them the airport is an extension of their office,
• 70% of constant travellers work at the airport when their flight is delayed,
• Constant travellers use mobile devices such as laptop, smartphone and tablets significantly more than other travellers,
• They use their mobile devices significantly more than other travellers for network access (VPN etc.) and social networking,
• For many travellers who identify themselves in the survey as constant travellers lounges are not important. They prefer to work at the gate or café.

As I have shown in my research there is growing group of regular business travellers (constant travellers) whose needs in the airport are not addressed in the design of the airport terminal. Airports and airlines only seem to acknowledge that privileged business travellers with access to airline lounges or exclusive working areas need to work in the airport: Lufthansa’s separate terminal for first class / HON passengers at Frankfurt International Airport is an example.

These constant travellers either have access to lounges, or they prefer to work near gates. But airport gates are in most cases designed only for waiting.
Many airports provide office complexes, meeting and conference centres, like, for example, Frankfurt’s The SQUAIRE (discussed in Chapter 2 above). But these office centres are designed for meetings and doing business at the airport as a destination, not for constant travellers in transit.

In Chapter 3, I showed that mobile work in the airport’s hybrid space could be an alternative. This is, however, limited because many European airports still do not provide free Internet access or power supply for mobile devices and recharging batteries. Airport design needs to reflect the fact that airports are becoming an extension of the constant traveller’s office. An exception is Terminal 2 at San Francisco International Airport where Gensler has provided a hotel-lobby-like situation at the gates with various waiting and work settings.

![Image](http://www.sfoairport.com/news/terminal2/gensler/image.jpg)

**Fig. 140. A good example of a design-thinking shift is the Virgin Airlines gate at SFO Terminal 2. Gensler (2011)**

There are a few other examples of airports that try to respond to the needs of mobile work and flexible workspaces somewhere between the home and the office. In 2011, Swisscom designed a Work Box, a diminutive office room equipped with Internet, printer and video-conferencing system. It offered mobile workers silent working conditions in a busy environment. People could book and access Work Box via mobile phone. The idea was tested at railway stations in Switzerland but was not further developed because of its high costs and low interest levels. Perhaps this design was object and business cantered instead of responding to the human need to be integrated in and with the social environment. In one survey, a majority of people responded that they would not use the Work Box, they would rather work in a café. (Rizzi 2011)

![Image](http://www.swisscom.ch/aboutus/press centre/news/2011/05/25/20110525swisscomworkbox.jpg)

**Fig. 141. Swisscom Work Box (2011), (Source: http://www.20min.ch/finance/news/story/13736188)**
Another example is from the global company Regus, which offers workplace facilities and services supporting business. Recently Regus developed a system of business lounges for mobile workers to “provide productivity on the move” (http://www.regus.com/thirdplace/). These convenient express workspaces are found in motorway service stations, retail centres, airports and railway stations. But, like airport lounges and SBB Business Points at Swiss railway stations, these workplace facilities are not entirely integrated into the social space of the mobility environment either (http://sbb.ch/en/station-services/am-bahnhof/businesspoint.html)

Fig. 142. Regus explores designs for flexible workplaces that enhance productivity on the move. (Source: http://www.regus.com/thirdplace/).

I would argue that airports are a special kind of "3rd place": complex transportation system for global mobility, new local and global thresholds, in other words "Aerotropolis". Therefore, airport territory should reflect how mobile work and travel in hybrid space happens, because constant travellers are an increasingly growing group of mobile workers that spend vast amounts of time in airports. It is, then, important to integrate a variety of workspaces into the airport territory. Terminals should have a variety of workspace modules supporting activity-based work integrated within other activities (from check-in to gate) that bring constant travellers, space and technology together. Hence my design principles for a hybrid airport workspace tailored to the requirements of constant travellers.

My aims were to

• Assist with the planning and design of airport hybrid workspaces,
• Define zoning principles for different stages of air travel,
• Define a range of settings, elements and allocations,
• Inform, but not replace, the need for space analysis,
• Design individual workspaces in and for the airport.
Analysis
I developed guidelines for a limited set of space types that remain flexible and address a variety of settings and specific airport needs. Airports should first identify their constant traveller count and work profiles – what kind of activities they perform, what interactions they pursue etc. These diagnostic measures would help architects and planners understand the needs of constant travellers and allow better space allocation and choice of components for the actual design.

Range of setting / zoning
Based on my study of constant travellers and mobile ways of working, I divided the hybrid airport space into six primary mobile work settings that support work efficiency, health and emotions:

• Social co-working zone (face-to-face connection, serendipity, inspiration, informal exchange),
• Team zone (host meetings, wide variety of work sessions),
• Quiet zone (individual seating, supports concentration but visual contact – tune out the noise),
• Privacy zone (support focused work, discrete conversation with sound isolation),
• Wellness zone (provides possibility to re-charge and exercise),
• Service zone (provides storage and multifunctional devices).

Fig.143. An installation by Ronan & Erwan Bouroullec for Vitra, Salone Ufficio, Milan April 9 – 14, 2013

These primary mobile work settings would provide a variety of modules (work components) supporting the following work activities and behavioural settings:
• Focus rooms (enclosed workspace for individual work, phone calls, video conferencing and confidential activities),
• Work bays (workspace for individual or small group work, power supply),
• Seating cabins (workspace for individual or small group work, power supply),
• High work settings (supporting informal work while standing),
• Workbench setting (to allow informal collaboration, with surface to support a laptop),
• Meeting rooms with video conferencing and flexible tables (with flat screens),
• Workshop / brainstorming rooms (with flexible furniture and erasable paint walls to write on),
• Board room (with beamer and/or flat screens, smart boards),
• Training room (with smart boards),
• Chill-out lounges (with soft seating and working possibilities),
• Work café zones (various work seating with amenity providing warm and cold food),
• Regeneration pods (to de-stress and meditate),
• Fitness and yoga rooms (for exercise),
• Sleep room (private enclosed room with place to lie down),
• Service point (area containing multi-function devices eg. copier, printer, scanner, shredder and layout space),
• Lockers (for personal belongings).

These modules would give constant travellers enough options for how and where they want to work. Architects could use as inspiration a set of modular furniture already designed for mobile work in the office environment. Some of these modules could be booked on demand, while others would be free of charge. Examples are:

• Reconfigurable “Workbays”, designed by Ronan & Erwan Bouroullec (2012) for Vitra,
• Seating cabins "Alcove", designed by Ronan & Erwan Bouroullec (2006) for Vitra,
• Joyn Workbench, designed by Ronan & Erwan Bouroullec (200e) for Vitra,
• Work Box by Vitra.

**Fig.144. Examples of possible configurations of Alcove Highback Sofas for various work situations designed by Ronan & Erwan Bouroullec for Vitra (Source: http://www.vitra.com)**
Assembling hybrid workspace zones in the airport terminal

It is important to provide constant travellers with various work settings at all stages of their journey if maximum flexibility and undistracted airport hybrid workspace is to be achieved. It is also important that these zones have sufficient daylight and wireless access to Internet. I propose the following areas and zones as suitable airport workplace settings:

- Departures (social zone, team zone, service zone),
- Airside (quiet zone, social zone, wellness zone, privacy zone, service zone),
- Gates (quiet zone, privacy zone, social zone),
- Arrivals (quiet zone, social zone, team zone, service zone),
- Airport city (team zone, social zone, service zone).

Fig.145. Examples of Workbench and Work Box by Vitra (Source: http://www.vitra.com)

As shown in Chapter 2, some architects and designers have already recognized that intuitive systems, natural lighting, comfortable seating, choice of amenities, green walls, a hydration station, good air quality, and the integration of art are crucial for humanizing an airport to convey a memorable passenger experience. But my studies have revealed that for one group of passengers in particular (constant travellers) the airport has become an extension of their workplace. The design principles outlined here may inspire architects and designers to further explore the issue of the airport terminal as a hybrid workspace.

Summary for Chapter 5

In summary, designing for hybrid workspace in the airport requires system thinking about how all products, spaces, surfaces and technologies are interconnected. Such thinking must be based on an understanding of constant travellers’ behaviour and needs. Only then can an effective design strategy to improve their work and air travel conditions (health, emotions) be developed.

My artists-in-labs residency not only taught me about the methods used in applied psychology, it also showed me that working together with scientists was an intense and extremely inspiring exchange process. Being nurtured through this process enriched my way of working and boosted my confidence. The experience has led to a new design concept based on a set of video interviews (see DVD Appendix) and another residency with the Blast Theory Group in Brighton, UK (7-23April 2010), as
well as background research into mobile technology applications (locative media, gaming and architecture).

The emotional design for PAXman 2.0 helped to address the feelings of solitude by offering constant travellers the possibilities of asynchronous communication. This would improve the airport travel experience, although it did not mitigate the stress of their working conditions inside the airport. I also learned that mobile devices could offer guidance during air travel particularly during flight delays. These new scenarios for design interventions within the airport space were based on alternative activities (health, food, networking, socializing, eco-consciousness) and were offered to constant travellers through mobile networks. However, this only partially improved work conditions. Design strategies based on augmented media solutions suggested that the issue of connecting digital and physical space must be addressed within the context of the airport as a hybrid workspace, with its topological zones for work and social interaction.

Architecture for a mobile society requires a holistic approach, for place–people–technology can no longer be addressed separately. New design strategies need to be informed by an understanding of people’s needs and desires, how they interact with technology and architectural space. Object-oriented architectural design must be changed into holistic airport experience.

Only holistic design thinking leads to innovation and transformation of mobility environments and helps to create a better airport experience. Furthermore, in order to foster innovation in unknown territory, a trans-disciplinary approach in research and design should be deployed.

Concluding this thesis in Chapter 6, I will show the relation between my research in Chapters 4 and 5 and Chapters 1, 2 and 3 through the lens of human-centred design and the user experience.
Chapter 6
Conclusion of Thesis

Introduction

In this thesis I have attempted to understand the future potential of work and air travel for constant travellers by combining design approaches from architecture and methods from social studies.

For this research purpose I have defined constant travellers as a group of people whose recurrent travel by plane is work-related. Multiple studies about constant travellers, as well as the literature review, have revealed that these passengers belong to a continuously expanding group of knowledge workers rather than to the so-called kinetic elites. They are mostly corporate employees, academics, professionals, artists, and freelancers, or start up entrepreneurs. For them, air travel is no more than a part of work routine, a necessity for face-to-face contact with their global network of co-workers and clients, and the need to validate their expertise by attending conferences and trainings on a regular basis. Through their use of portable devices (e.g. laptops, smart phones), and their re-appropriation of airport spaces (e.g. coffee bars, restaurants, waiting areas, gates) for their work activities, this user group redefines airport transit space as a hybrid workplace.

The thesis has sought to answer the following question: How can airport territory as an interface enable work and at the same time endow constant travellers with greater efficiency, and with physical and emotional comfort?

First I explored the historical, experiential and design issues that emerge when the airport is considered as an interface with the complex and distributed workspace of constant travellers. I discovered that advances in technology and global mobility gradually transformed airport terminals into a metropolitan territory (Aerotropolis) and altered airport transit into a geopolitical extraterritorial (Airside) space. Over the last 100 years airport owners, architects and designers responded to the demands of constantly evolving airports, but they still did not address the actual needs of constant travellers. Therefore, I argue that the airport territory needs to be repositioned as an extension of the networked office (3rd place), a place that enables concentrated work as well as informal collaboration, and provides a healthy and comfortable (hybrid) workplace for constant travellers.

The second part of the thesis was my practical research and response to the theoretical discussion in Part 1. In these practical examples, I addressed three aspects of the airport interface in order to improve the airport experience for constant travellers: physical, digital and social space. The following three airport design questions were addressed:
On the level of human-space interface: how can airport territory be re-conceptualized to accommodate the notion of networked office?

On the level of human-computer interface: how can computer interfaces become an integral part of the hybrid workplace in the airport?

On the level of human-human interface: how can design arrangements of airport hybrid workplace facilitate social interactions?

As a central argument of my thesis, I contend that the design of the airport hybrid workplace requires a holistic approach that focuses on understanding constant travellers’ needs, and involving them in design. Therefore, airport architects and designers need to combine analysis from social studies and architecture to better understand the circumstances of mobile work and travel and to inform the design of the hybrid workplace for constant travellers.

This process has taken me on a journey to understand the future potential of work and air travel for constant travellers. The following recommendations have been derived from the research undertaken in this thesis.

6.1 Historical Overview – Airport Evolution

**Recommendation 1** – First, I showed that it is necessary to understand the how airports have developed over the period of the last 100 years. Historical literature clearly indicates that airports are constantly evolving to assist growing economic demands and political situations. In the first chapters of this dissertation I traced a history of architecture and how designers have not always been able to deal adequately with the changing patterns of passenger use of airports. I recommend that design approaches need to radically change in order to be able to accommodate constant travellers’ needs. To evolve further, airport design approaches must focus on needs assessment and involving constant travellers and designing airport experience according to their needs instead of primarily focusing on providing functions supporting the interests of various airport stakeholders.

**Lessons Learned from Work in the Airport**

Over the past century, the technological innovation of flying has disrupted existing movement patterns. This transportation novelty triggered changes in society and the economy, and offered new business opportunities worldwide. Since the end of the 1920s, the growing demand for air travel led to the international development and commercialization of aviation. Over time, airports became employment generators. The evolution of the airport into a multi-hub system in the 1980s raised the market share of airport hubs, increasing cargo and passenger traffic. They became a tool to stimulate the economy through continuous territorial and economic expansion until they became "Airport Cities" or even "Aerotropolis". Therefore today, airports are hybrid spaces; travel and mobile work
must be considered as new multi-purpose work environments, a substantial part of the networked office for knowledge workers on the move.

**Lessons Learned from Business and Users**

Although the birthplace of the airline industry was Europe, it was the US aviation business that fully exploited air travel as a new lifestyle (overseas vacations) with products that can advertise the new American "way-of-life" for a rising middle class. This understanding of the marketing and business potentials, quickly turned airports into places of consumerism with business incentives to create "comfortable and familiar environments" (like air conditioned hotels or chain restaurants to avoid "culture shock") for American tourists and business people. By the 1970s, flying had changed the perception of the world for businessmen who began to spend most of their time in the air or, for the lucky few, in a pilot’s seat. Overt the last two decades, the further commercialization of air travel and the emergence of a global economy have prepared the ground for mobile work and the phenomenon of the constant traveller. But airport design still has not sufficiently responded to this shift, but has rather followed the logic of processing passengers with ever-expanding waiting areas, walking corridors and spaces of consumption to generate revenues.

**Lessons Learned from the Design Issues**

Since the beginning, architects primarily focused on the function of the airport to provide faster and more efficient ways of processing passengers. This design approach led to the development of airport architecture as a complex system of corridors that could connect terminals and planes, and long walks that caused disorientation, stress, frustration and fatigue for passengers. Although some architects attempted to define an appropriate style for the airport that might express the essence of air travel, they were overly concerned about form and function, rather than the actual passenger experience. Encouraged on by a need to generate greater revenue, airports began combining an idea of luxury and leisure with the act of flying. Marketing and branded design soon became tools used to create "the airport experience", and passengers were quickly reduced to the role of consumers.

In the jet age period, architects planned routes to optimize concession revenues, and aimed to create the illusion of fun and enjoyment, and so designed luxurious spaces for wealthy travellers. In contrast, a new design approach could focus on passengers and their need for better orientation in the airport. This needed graphic designers to develop signage for wayfinding in the maze of the modern airport. This "passenger first" concept was immediately successful and improved passengers’ airport experience. As I have shown, Saarinen’s holistic design approach – was focused on the design of every detail in the airport flow from the passenger perspective (Saarinen, 1958) and this design contributed to the iconic status of the TWA terminal. Thus design approach can emphasize the importance of understanding passenger needs and the results can improve the airport hospitality as well as enhance the airport experience.
6.2 Relationship between Space and Social Interaction

Recommendation 2 – The relationship between the experience of space, social interactions and the potential of mobile technology in that space should be explored prior to the design process. Without this investigation the space will not suit its users. I recommend airport designers to focus on creating a sense of place and community by exploring the possibilities of both human-human and human-computer interactions between passengers. Also, more attention should be paid to designing a healthy environment by providing contact with nature, physical comfort and alternative ways to spend time dwelling in the airport. In the case of constant travellers, designers should reposition the airport as a hybrid workplace and explore the potentials of informal collaboration, ad hoc meetings and co-working in the airport context.

Lessons from Air Travel

I posit that by focusing on technology instead of human interaction, the passenger experience might be reduced to information, instructions and prohibitions and that this can alienate passengers in the airport flow-space. Moreover, airport thresholds for security and border controls are now the places of "new surveillance" of passengers, monitoring their data, as well as their belongings. Sorting, profiling, tracking and surveillance of passenger behaviour has established much more formal interactions and divisions between those who control and those who are controlled.

To ease growing congestion at the border and security thresholds architects looked for flexible systems and vertical spatial solutions (e.g. Zurich Airport, Hong Kong), while designers attempted to apply human-centred design to calm tension at the checkpoints (e.g. TSA Checkpoint Evolution by IDEO). All these approaches may have helped to reduce waiting times and stress levels at checkpoints, but they could not reduce surveillance paranoia and passengers’ need for the emotions of respect and dignity.

Slowing down passengers to increase revenues by integrating shopping into the airport flow is another important aspect of shaping airport space and social interactions. The excitement of travel, confusion about exchange rates, jetlag, ease of stress after passing through checkpoints, and passenger profiles based on behaviour patterns are used by airport operators and designers to manipulate passenger needs. Here, the function of airport space and interactions is often reduced to consumption. In fact Airport managers, architects and planners have attempted to respond to the analytical observation of most social scientists: that the airport is a "non-place". They infuse the airport terminal with local identity by using historical names and signifiers, allocating or featuring local food and products, the use of local building materials, or the featuring of art and design from the local region. But creating these illusions of "place" still supports an ideal of consumption rather than one of increased social interaction.
By adding non-commercial functions to airport terminals, alternative ways to spend time dwelling in those airports may give more choice to passengers as well as create more situations for human-human (f2f) interactions. Also, adding functions such as gardens, green walls, natural light, or drinking water can address the passenger need for physical comfort and offer a better balance between human-nature. Also by adding better software designs for interaction the human-computed relationship may also be improved.

All these developments may help the "airport to become a destination"; another emerging airport city-like function, with “fly in – fly out” business centres, offices, training centres and even medical services for business, education and medical travellers and local residents.

Airport managers and architects should acknowledge that constant travellers are currently stretching the capabilities of mono-functional zones in airport terminals because of their mobile work style. They are already converting restaurants, gates and planes into hybrid workplaces.

**Lessons from Mobile Work Style**

As I have shown, Air transport and digital technologies have enabled business and professionals to intensify their work-related activities on a global scale. As a consequence, many knowledge workers who wanted to succeed in their careers felt compelled to operate within global networks and to travel extensively for work purposes. In this thesis I concluded from interviews that these constant travellers have become new type of enforced cosmopolitan rather than a "kinetic elite" – and they often admit that their mobile work-style is a necessity rather than a privilege. Their self-image nevertheless often complies with that of the successful cosmopolitan often created by western media. Constant travellers do develop a series of mobile work and air travel strategies to work efficiently in multiple space-time zones. They communicate, share and develop ideas and work in a hybrid space, on the move, in many locations including home-office, client site and airport.

Today, this distributed working trend creates fluid relationships dispersed over space and time in multiple locations, and causes networked office boundaries to expand into the city. Knowledge workers can make their own decisions about when and where to work, so they act as urban nomads working in the streets, parks, gardens, cafes, hotel lobbies, restaurants, trams, trains and even in cars.

**6.3 User Consultation**

**Recommendation 3** – Airport design is a complex issue that has to function within a broad set of independent domains: the logistics of flow, services, architectural structure and aesthetics. But it is also strongly influenced by socio-economic and political considerations discussed in social and mobility studies. A literature survey provides a better understanding of the social context and the
motivations of passengers. A better assessment of constant travellers’ cultural, emotional and practical
needs should inform design for mobile work and travel. Therefore, constant travellers should be
consulted about the potentials of airport workspace, and its suitability with regard to efficiency and
social networking. A combination of methods from social studies with participatory design should
actively involve constant travellers in shaping future airports as hybrid workplaces, and promote the
creation of a multi-sensory airport experience.

**Lessons from Social Studies Methodology**

Airports cannot be understood without a new focus on social and mobility studies. The experience
 gained by conducting airport field research motivated me to step out from my architectural "comfort
zone" (domain expertise) and conduct research about living in motion. It was the first time I had used
interview techniques and I discovered the power of analysing stories told by people. These interviews
gave me insights into the real issues of what it might be like to "live-in-motion". Furthermore, my
field research at Frankfurt Airport, together with a literature survey about visionary architectural
project from the 1950s and 1960s (New Babylon, Archigram, Cedric Price), led me to my focus on
constant travellers. But it was the social methodology learnt from my experience in as an Artists-in-
Labs residence at the HCI Lab at the Institute of Psychology, University of Basle that led me to
combine qualitative methods of interview techniques with more quantitative approaches of surveys
about constant travellers. These studies helped me to understand the cultural, emotional and practical
needs of constant travellers and their significance for airport design. A series of case studies presented
in Chapter 5 enabled me to conclude that airport architecture for a mobile society requires a an
understanding of the holistic potentials of place-people technology.

**Lessons from Work Environment and Mobile Technologies**

I combined the lessons learnt from my social science research on constant travellers to my practice as
a strategic workplace analyst and design consultant. In the first instance, I applied these lessons to
work I was already undertaking for doctors in a participatory design process for the hospital hybrid
workplace (Chapter 3, case study 2), actively involving them in shaping their work environment. Since
the 1960s, participatory design\(^7\) has been used, but today user experience (UX) design, interaction
design, and software development are an integral part of many schools. Nevertheless, many architects
still focus more on style rather than on the user, and the aviation industry does not yet fully recognize
the airport’s role as a workplace for constant travellers. Architects should, therefore, actually consult
constant travellers, who live and work in motion in hybrid space. As Augé suggests this is a "world we

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\(^7\) Participatory design – a design and innovation approach in which future users (e.g. employees, partners, customers, citizens, end-users) are invited to actively cooperate with designers, researchers and developers. Participatory design has been known since the 1960s; it was invented in Scandinavia as “cooperative design” and later the name was changed to participatory design (Asaro, 2000:265). The term is used in many fields, including urban design, landscape architecture, environmental psychology, graphic design, and even medicine.
have not yet learned to look at” (Augé 1995:34). Such trajectories would help designers better understand passengers’ needs, and even enable them to participate in the creation of the future of the airport as an interface between mobile work and air travel. Only then can airports become better "future urban forms" (Fuller & Harley 2005).

6.4 Holistic Approach to Design

**Recommendation 4** – A holistic approach should be taken to architecture- particularly towards the emergence of new hybrid spaces in places of transit that include case studies of interaction, emotional responses from interviews, and health issues in current airport hybrid space. However, the actual space has to end up reflecting this analysis.

Architects and designers must find ways to design airport interfaces that support the actual needs of constant travellers: their efficiency and quality of work; their air travel-health balance; their bodily comfort and also their sense of place and community. Design strategies for the airport, as a genuine hybrid space, should focus on multiple aspects:

- Improving conditions and efficiency of work and air travel. Airports should provide real workplaces for constant travellers that complement and enhance both physical and virtual space – hence realize the concept of the “hybrid workplace”.
- Maintaining a balance between the negative impact of air travel and good health. Airports should provide contact with nature (e.g. natural light, fresh air and water, green spaces).
- Creating multi-use spaces that accommodate activities, those that are not directly related to the task of being PAX but supporting the physical needs and health of constant travellers (e.g. diverse seating, exercise opportunities, healthy food, place to sleep and relax, wellness).
- Improving the “sense of place” in airports by creating opportunities for social interaction and engagement in the community, as well as places for reflection.

6.5 Pooling Resources

**Recommendation 5** – Researchers from different disciplines should pool their resources to construct more valuable design results. Good transdisciplinary teams might include an architect, a workplace consultant, a social scientist, an interior designer, an interaction designer, airport and airline managers, airport operators (including CRE & FM managers from global organizations), and users (constant travellers).

**Potential Outcomes that Would Change Airport Space and User Mobility**

- Engaging constant travellers, workplace consultants and architects, as well as airport and airline managers, would facilitate the creation of multiple airport hybrid workplaces
addressing diverse needs and situations for focused work, as well as opportunities to meet, collaborate and exchange ideas.

- Involving global organizations (e.g. companies with many constant travellers and, café chains) to establish financial synergies for airport models with shared spaces for constant travellers (e.g. culture club, “cohabiting”, open house, brand café).
- Involving social scientists, to bring their research insights into design and vice versa.
- Bringing together airport managers and stakeholders (e.g. managers of co-working spaces) to develop management strategies for co-working spaces for constant travellers from creative industries.

**Potential Outcomes that Would Help to Facilitate a Variety of Approaches**

- Engaging interaction designers, architects, interior designers and users to develop multi-sense environments.
- Inviting media artists, interaction designers, software programmers and architects to develop alternative uses for hybrid airport space – e.g. exploration potentials, role-playing applications or game projects using mobile devices (e.g. Blast Theory).
- Inviting academic researchers from social studies for consultation

The following guidelines are suggested for designing airport territory as an interface enabling an efficient and comfortable work and dwelling experience:

- Apply a holistic approach to the design of the airport interface for work (people-space-technology).
- Survey literature in social studies and design related to mobility studies, mobile work, airport and workplace design, and user experience (transdisciplinary perspective).
- Analyse the existing and potential relationship between use and experience of space, social interaction within this space, and use of mobile technology for mobile work and travel (ideation).
- Involve constant travellers to actively participate in the design process from early design stages to assess their actual needs and concerns (user focus).
- Form transdisciplinary design teams (architects, workplace consultants, interaction designers, airport owners and other stakeholders who are concerned in the project).
- Create a sense of place by enabling social interaction within the designed space.
- Reposition the airport as a hybrid workplace for co-working, informal collaboration and ad hoc meetings.
- Include nature in the design of healthy workplace environments
• Think out of the box! You have entered as yet unknown territory.

New Knowledge Points

• Airport architecture is being already being transformed by the increase of global mobility and the applications of digital technology, which has resulted in enormous changes in passenger experience. It’s effect on passengers have been discussed in in literature from mobility studies, urban geography, architectural theory but the insights from these fields of practice has not really had any practical impact on the fields of architecture and design. Therefore, this research, may offer seminal information for other researchers in these fields as well as airport architects, interior designers, interaction designers, software developers, airport and airline managers, airport operators, workplace consultants, and global organizations (CRE & FM).

• New knowledge can be generated from the application of social science methodology to design, and this transfer can help to address user needs more immediately.

• Re-thinking architecture and human behaviour can generate new knowledge because it re-connects constant travellers with the transit space and makes travelling a more meaningful experience.

• Re-thinking architecture and mobility studies can generate new knowledge because it connects knowledge workers with airport architecture and contributes to a better understanding of life in corridors.

• My own design knowledge has increased from this research, as I come from being an architect, who has branched out of her field and explored different results from surveys of interventions in art (Artists-in-Lab exhibition at ISEA Singapore, Blast Theory), science (HCI Lab at the University of Basle’s Institute of Psychology), and iterative design. As far as I know from my research, these interventions have not been combined before this dissertation.

• In relation to architectural education and research, this project attempts to be novel inasmuch as it challenges the reader to think about designing airport hybrid spaces from a different perspective – e.g. that of human interactions in virtual and physical space.

Further research recommendations for further research include:

• Airport designers themselves to consider changes currently taking place in particular in relation to mobile work.

• Industrial designers to think about different passenger needs when designing mobile solutions and airport spaces.

• Young architects to learn more about social methodology and use it in their own processes.
It seems to be essential that airport architects and designers will be required to share analyses from social studies and user oriented architecture in order to improve the work oriented facilities of constant travellers in the near future. Furthermore production teams need to be formed that share analyses from trans-disciplinary fields.

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Appendix List on the DVD Supplements

**DVD 1**
A selection from 7 qualitative interviews with Constant travellers (video - quick time format)
1 quantitative survey "Mobile Identities" (adapted from on-line results) and evaluation
1 video "Airport Transit Condition", 2006 (quick time format)
6 Homo Ludens interviews in German (quick time format)

**DVD 2**
1 documentary film from the Artist in Labs Program, 2010 (12.min)