AIR PORT

CONTRADICTORY SPACE

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aéroport: un espace contradictoire

énoncé théorique

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_AIRPORT:

_ Point of departure or arrival for a flight. Commonly represented by a three letter IATA/ATA code; may or may not be the same as the code for its associated city. See “Location Identifier”.

IATA PADIS 07.1[1]

INTRODUCTION

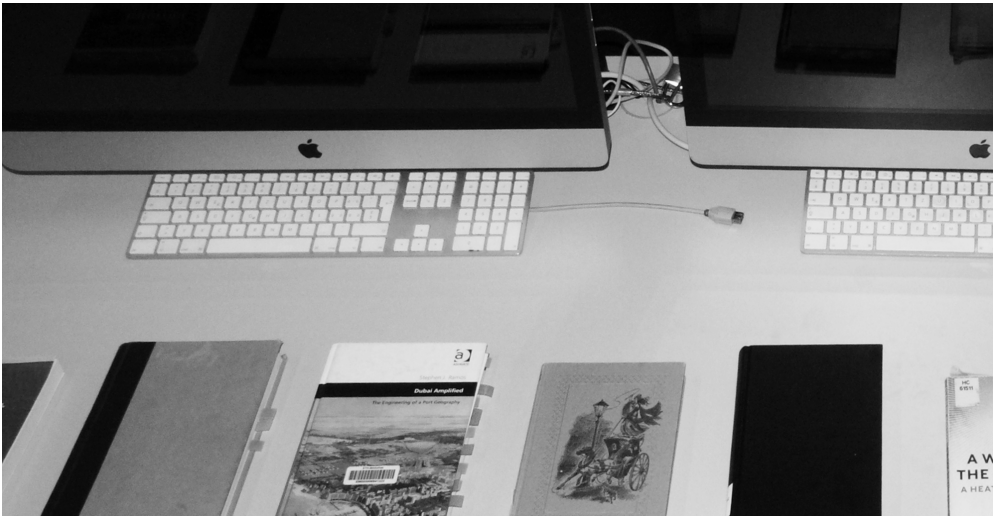
_*Why an Airport?*

A typology that has appeared first only a couple of centuries ago has become one of the most important centers of traffic in the past decades. This type of architecture is often neglected by many as it is not a stationary like other buildings. It's about flows and rapidity, meaning it is highly regulated, and therefore it may seem for one that there is no space for architecture. However, for others, an airport is one of the most current types of architecture as it symbolises the rapid flows of our highly digitized society. It evokes the problems our profession faces today, notably confusion of scale and the return of ornamentation [Picon, 2013[2]]. As our world is becoming more connected through the Internet and advanced infrastructures, the notions of individuality and locality have become blurred, often resulting in peculiar contradictions. These are fully present In airports, for example the duality of private and public in the airspace and control zones, or that an airport can be experienced either from the inside or from far away, a height of a flying airplane. This building is an articulation point between various aspects of our society, that is trying to define a small scale in this big world.

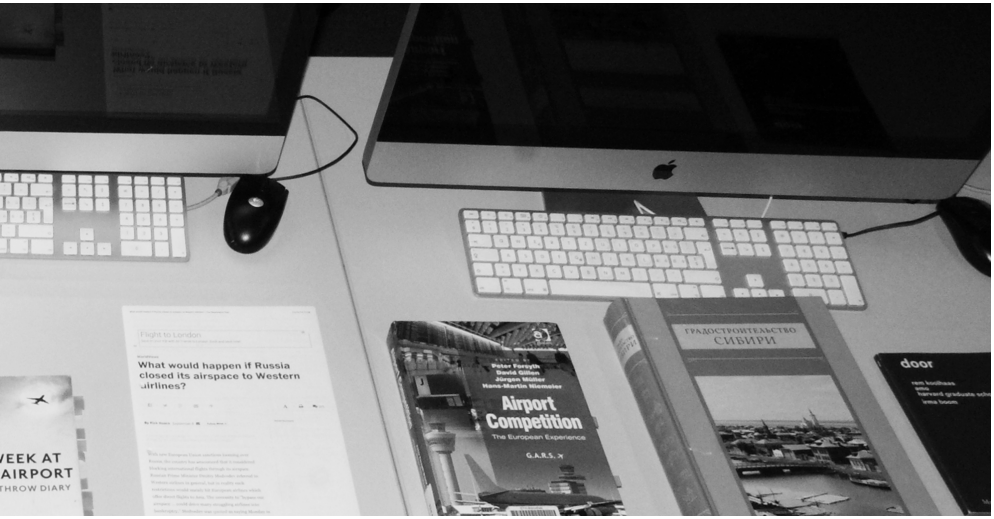
_*Why in Siberia?*

The globalisation has brought the economies of Europe and Asia together, and as different companies and families look for closer and faster physical contact, they use the fastest way to travel: by air. However, as their main interest lies in an exchange, the travel to another country can be quite bothersome as the time is lost for travel, for adaptation to another climate, food and time zone.
Meanwhile, the huge region in between the two continents, Siberia, that is undoubtedly rich with natural resources, is yet still unexplored as an intermediate zone. Its potential of various resources is also clearly underexploited. The construction of the trans-siberian railway has boosted the region and, through modernisation, has disclosed some of the treasures the land held. However in last years the region has been partially neglected as the economical interests of the Russian Federation have lied more in Europe. The proximity of mentalities and the history of relations dating back to the time of Russian Empire were the dominant reasons for this choice of economical relations. The stability of contracts, and the consistency of oil prices have not encouraged the government to look for other contracts in the East either. However, the recent conflict in Ukraine has had its impact on the stability of relations with European partners, shaken by mistrust and sanctions. This has brought forth the need for new contacts. Russia has “remembered” that as a country situated on two continents it also has neighbours in the East it can deal with, and it signed the gas contract with China shortly after the start of the conflict [BBC 2014].
This strengthening of relations with its eastern neighbours evokes the need to develop the region that is close to them to assure smooth relations - the Siberian part of the country. An international hub, like the trans-siberian railway at the turn of the twentieth century before it, would reveal some more of the potential this land beyond the Ural mountains holds.

METHODOLOGY



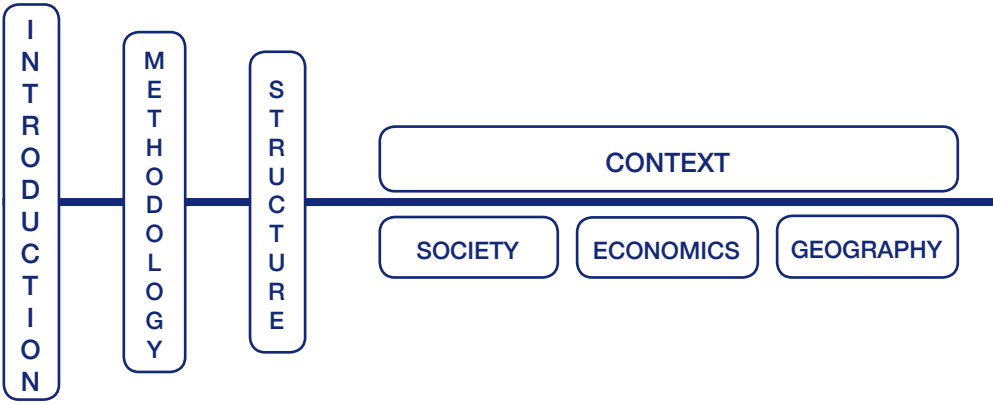
An airport is an object of multiple dimensions. These diverse dimensions have fascinated not only the engineers, but also writers, filmmakers, photographers and others. The multitude of perceptions has led to diverse interpretations of an airport from being a place to live in the movie Terminal to being defined as a transitional point by International Air Transport Association. The heterogeneity of airport portraits shows the complexity if this object, that cannot be expressed by only by one type of source. This work has tried to use a multitude of sources to express the various dimensions found of an airport. Movies, books, technical documents produced by IATA, analysis done by other architects,visits, opinions, discussions, websites, reviews of the workshops,aerial views, diary, works of artists, theoretical texts, articles were all used to collect information to understand what is an airport. The data and the ideas in these materials are an integral part of this work, being present in images, schemes, photographs, scans, screenshots, citations or directly interpreted in the text.



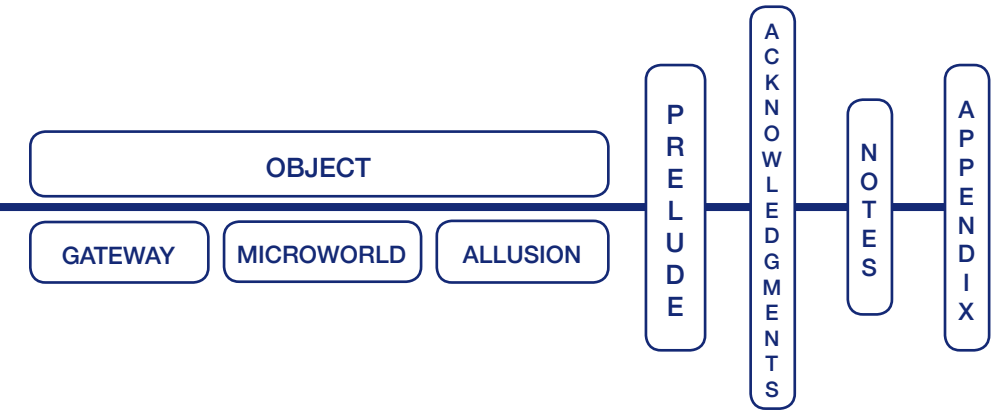
The contextualisation of an airport is also rich in its various aspects, especially being situated Siberia. The region of Siberia is part of the country of Russian Federation that is part of two continents. It is global and local at the same time in different dimensions, notably social, economical and physical, which are intervened between each other. The temporal aspect of the research, targeting the most recent information, has influenced the materials used for research. Articles from across the globe, websites, advertisements, books, spatial analysis, movies, workshops, handbook, diary, reports, journals, discussions, planification strategies' map are the sources of the ideas and the data used in this work. As before, the visual data is presented in images, whilst the verbal data is quoted and interpreted.

It's clear that the complexity and the diversity of dimensions of the both, the object and its contextualisation, can be found in many more sources other than the ones used. This shows that the richness of the subject approached cannot be resumed in a few pages. This work, though, tries to give an "aperçu" of the issues and the pists for the diploma project in the next semester.

STRUCTURE



The first part, Context, looks at the reasoning behind the Airport in Siberia. It consists of 3 parts looking at the contemporary states of society, economics and geography that lead to the elaboration of such an object. The part Society proposes to look at the changes the information technologies brought to our society, changing the dynamics and and how this has influenced our need for air traffic. It comes to a conclusion that the expression of the society of flows is a space of flows. The Economic scope evokes intercontinental relations by stating the importance of communication between Europe and Asia. It shows the absence of recognition of their connection by the north, a route frequently taken by non-stop flights, for the shorter distance as well as for being a continuous singular secure airspace. This is followed by the description that the presence of a hub in the midst would not only intensify the exchange between the continents because of its convenience, but also influence the territory it is set in. In the third part, Geography, a potential location is examined by looking at the data such as flight trajectories which occur in the Siberian region, which is examined further to identify the places for a potential localisation of a hub, through existing nodes of infrastructure and the population in place. It is concluded by a small résumé which resembles the various elements approached above together.



The second part, Object, looks directly at what an airport is. In the 3 parts - Gateway, Microworld and Allusion - we are invited to look at its different functions. Gateway evokes the primary functions of an entrance, such as the transition as the act of crossing, control for the actual door and the representation of what's behind. The air portal is approached in its essential function as a point of access. In Microworld it is proposed to see this object as something more, as a fully developed type of architecture and to look at its peculiar singularities. The evolution of this type of building blurs the limits between the primary functions, resulting in a much more complex structure of typology and relationships of time, where a temporary space is also lasting. Lastly, Allusion part examines types of objects that evoke the theme of an airport. The symbiosis of their nature and their context has resulted in the relations to an airport typology. Some of these objects are more straight forward such as the busiest airport typologies and the development of Dubai thanks to large-scale infrastructures, whilst the last one, closed cities, take an opposite approach - that of a disconnected city - that is close off by its autosuffisance and surveillance.

The last part, Prelude, whilst indirectly synthesizing the work, has its main purpose in introducing the diploma project. The prelude is an interpretation of how, if the above were taken into account, the experience of a traveller in an airport could change. It begins to question the palette of changes possible in the architecture of the object to adapt to new context to enrich the space.

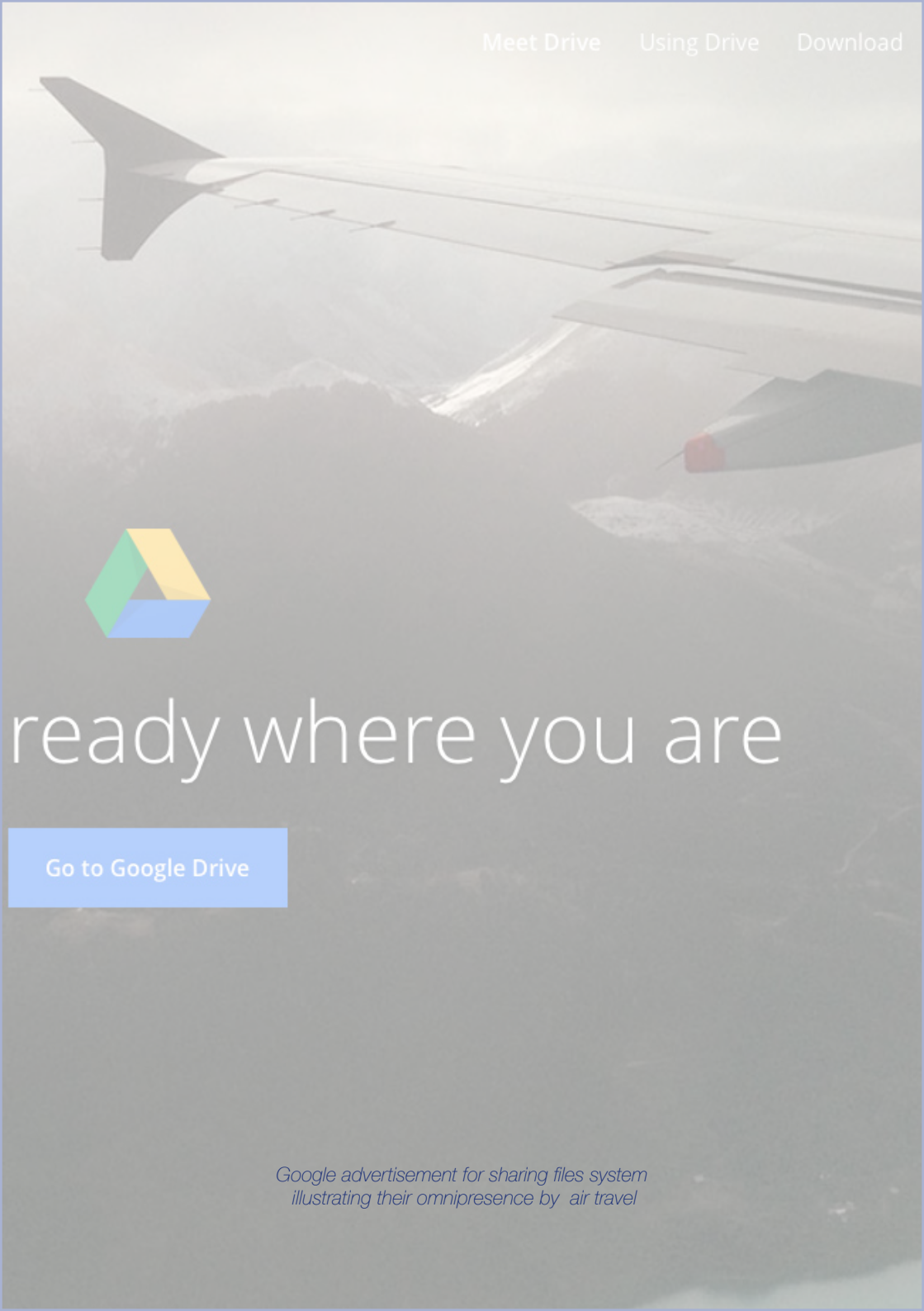
WRITTEN AND EDITED BY ANNA KOSENKO | JANUARY 2015 | MA SAR EPFL

CONTEXT

_CONTEXT

1 The circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood
1.1 The parts of something written or spoken that immediately precede and follow a word or passage and clarify its meaning

Oxford Dictionary[4]



Google advertisement for sharing files system illustrating their omnipresence by air travel

SOCIETY

PART I

DIGITALISED SOCIETY

Changes in mobility: transportation and communication

“Much of human social and economic organisation is predicted by accessibility and the artefacts that have created to improve accessibility”

Societies and Cities in the Age of Instant Access [5]

Human species, like many animalistic ones, have always sought the resources that would guarantee their survival. As Rousseau has mentioned in his Discourse on Inequality, the first preoccupation of men was the self-preservation – a question of life or death. The question of the resources has always been always vital – and their accessibility. The fundamental resources such as food, water and shelter have become commonplace as the access to them has been largely facilitated through transportation systems and the evolution of the tools, though not in every part of the world. The direct obtainment of the fundamental resources has faded away with time, giving way to preoccupation of acquisition of the resources that would facilitate access to the fundamental ones, or improve them, such as extraction of materials to create tools or knowledge to imagine them.

Society has kept developing new and elaborate ways to obtain the various resources, whether it was cities to facilitate interaction and exchange, or roads and tracks to facilitate the transfer. As the technologies have become more sophisticated, they have profoundly changed our interaction with the surroundings, whether material or immaterial ones.

As the transportation modes have evolved, they have changed our relationship with the physical space. We have started to measure the spatial perception by other values of time, as it was no longer experienced by natural ways - on foot, riding an animal or sailboat – but by the means of artificial objects that were motorised, such as a car or a plane. The ease with which human could overcome distances has become *unnatural*, altering forever our relationship with our surroundings, the way we occupy and use them, produce, consume or trade. Communication technologies have also changed human society as they have facilitated interaction between people. The possibility of reaching someone without the physical contact has had an impact on interpersonal relationships and activity organisation. People have become more mobile, being able to discover other territories that promised better life without losing contact with the one they parted from.

Talent mobility 2020 and beyond | PricewaterhouseCoopers 2012 [6]

World Flight Paths Map | James Cheshire | Spatial.ly 2013 [7]

The Internet took this evolution to another level. This platform of exchange is no longer based on physical space. The accessibility is no longer place-based, demanding the direct physical presence or "telepresence", but is rather people-based, as now we could access someone at anyplace at anytime. The approach of time has had also to evolve as this global communication network didn't have a sense of time as such – "The information [....] persists over time and cannot be controlled: seemingly ephemeral actions and events can be transported from the "here and now" to "everywhere and forever"" [J. Miller, 2007[8]]. The accessibility has been "freed" from physical constraints, becoming defined mainly by points of interest as nodes in the network with floating character, rather than by the routes connecting these nodes. However human beings are also physical, meaning that the material dimension of the exchange cannot be ignored. Thus we can observe an interesting phenomenon: the physical infrastructure for transportation of goods is becoming dispersed and efficient enough to guarantee transfer from one point to another, trying to imitate the ease of contact through the Internet.

It is not only goods that have to be transported rapidly - as for some the conservation of freshness is vital - but also people, who cannot neglect interpersonal contacts. This results in a considerate augmentation of the use of transportation as well as the constant need for the innovation – to go faster, to catch up with the immediacy of the speed that Internet has provided us with.

The Russian society has been mobile for centuries, because of the size of the country and it's development, that is concentrated in the western part. Different governments over centuries have forced this population to be mobile to develop and to assure the vast territory of the country. Today it has resulted in a heterogeneous society, where many keep relations on a practically global scale. The technological advances have allowed and intensified the richness of the cultural mix on the territory of ex-imperial Russia.

IMPORTANCE OF AIR TRANSPORTATION

Crossing the sky to bring people together

“The time is near when men will receive their normal impressions of a new country suddenly and in a plan, not slowly and in perspective ; when the most extreme distances will be brought within the compass of one week’s – one hundreed and sixty-eight hours – travel ; when the word ‘inaccessible”, as applied to any given spot on the surface of the globe, will cease to have any meaning”

Naked Airport [9]

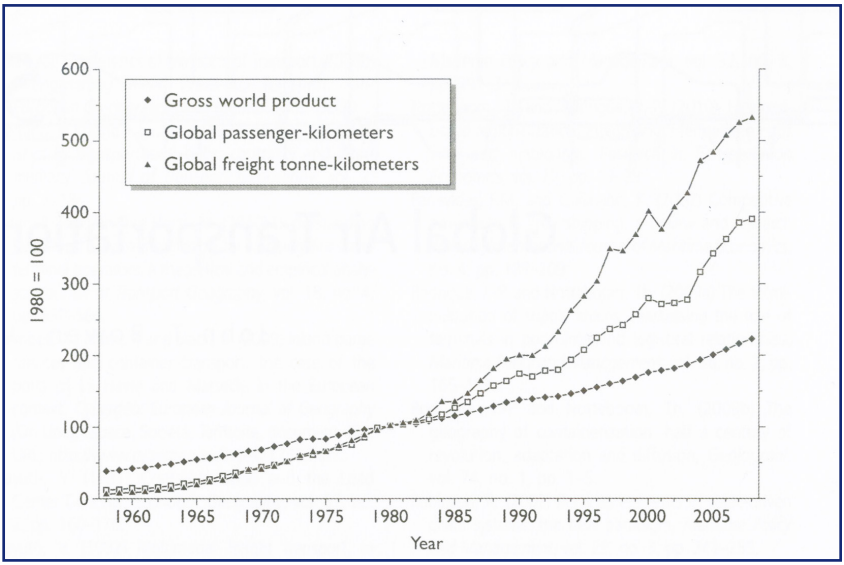
Humanity has long longed to master the space surrounding it. We have kept on developing and inventing ways to shorten distances separating us, creating different transport machines to converge time and space. However, the appearance of the aviation has radically modified this convergence as the space became detached from landscape. The air transport "seemed to dramatically shrink the world" [T. Bowen Jr., 2013[10]] and with the technological advances in the industry, as well as the political liberation, it has had an impact of its use in the everyday life.

As our society is becoming more and more digitized, the rapidity of the transition offered by air transport is crucial to its development. It facilitates the immediate physical contact that is important for developing ideas and fulfil social obligations, while having the liberty of being geo-spatially distant, not only on the scale of a city or a country, but far beyond.

Firstly, air transportation has enabled scientists and diplomats from all over the world to meet more easily, without having to sacrifice too much time of work for travel. Secondly, a person has more liberty to choose his or her habitat and workplace all over the planet, while still being able to attend different family celebrations or keep in touch with friends.

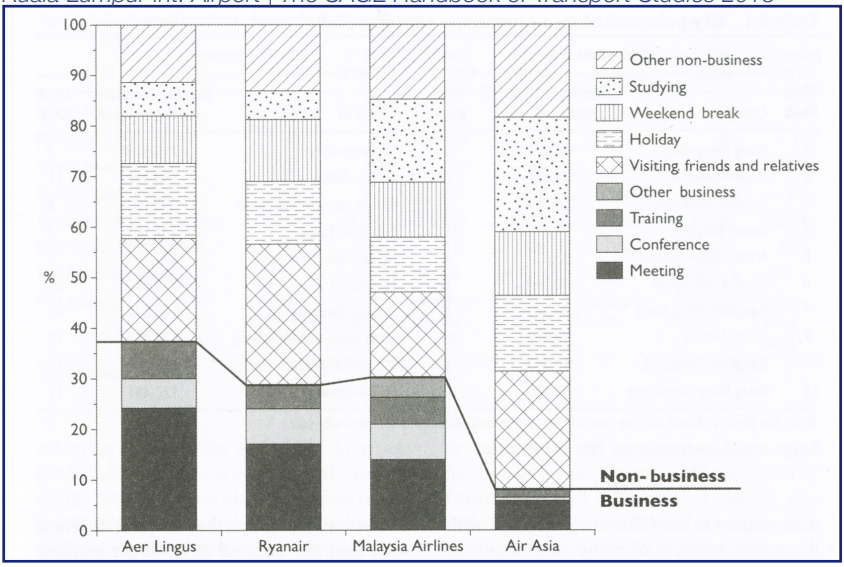
«If you think about it, your favorite memories, the most important moments of your life... were you alone?»

Up in the Air, 2009 [11]



Growth of air traffic 1959-2009
| The SAGE Handbook of Transport Studies 2013 [12]

Travel purposes for passengers on four airlines | travelers on Aer Lingus and Ryan air surveyed at two airports in Ireland; Malaysia Airlines and Air Asia surveyed at Kuala Lumpur Int. Airport | The SAGE Handbook of Transport Studies 2013 [13]



This *shrinking* of the world has brought people together from everywhere making the environment much more international and the meetings richer as the diversity of experiences between people was stunning. With physical contact the serendipity could take place. It has led to incredible advances in different sectors, such as scientific and financial, as well as radical changes in social segregation, as the countries with distinct cultures and economical development could come closer. The society on the global scale has had to start being more open-minded as it has become more international and diverse, mixing together different nationalities and habits. However it has also changed to be more economically segregated as the globalisation has put countries with different stages of development on one scale, concentrating highest incomes in the places of exchange of technological advances.

We could clearly see that rapid increase in Aeromobility shows the increasing importance for this mode of transport whilst the diversity of purposes signifies its integration in the everyday life. The importance of rapid transition is far greater than the feeling of fear to leave the ground and the planes has expanded in size to respond to the demand.

The society in Russian Federation has been mobile for a long time because of the size and the climate of a country. Its need for connecting different parts of the country together has been fulfilled by the extensive construction of roads, railways and other infrastructure. However, the real breakthrough has been travelling by air. In a country, where it takes a week of non-stop train to get from one side to another, to be able to cover the same distance in just one day has helped to assure the contacts of different parts of Russia, not to mention those territories that are not accessible by other modes of transportation, especially during winter time.

SPACE OF FLOWS

Airport as an expression of digitilised society

« Had one been asked to take a Marcian to visit a single place that neatly captures the gamut of themes running through our civilisation – from our faith in technology to our destruction of nature, from our interconnectedness to our romanticising of travel – then it would have to be to the departures and arrivals halls that one would head »

Week at the Airport [14]

Throughout our studies in architecture, and later in our profession we are asked to plan, to draw the space for very specific needs or people. We tend to consider it as a thing which, though not material, is very physical. However, B. Beaude in his book Internet: changer l'espace, changer la société offers us a way out of materialised conception of space that we have, that persists with us since the physics' classes in school, but acknowledging that the Internet is also a space. The author, by paraphrasing the famous philosopher Kant, thus tries to explain that space is the ordering of things. He then goes on demonstrating how Internet has changed our society as space and society are tightly related, by stating that space is a fundamental social dimension because it is an obstacle to interaction[15]. The interactions are vital to our society as they define it. However, space cannot be considered as only an obstacle; it is also the medium. The modes of transition shape the society. If we change the spatiality we have at disposition, the way we interact changes, and hence the society. This influence is not unilateral, society and space being interdependent. If the society changes, so shall the space. Our society has been changed by the technological advances. With the appearance of globalisation and the Internet, our inter-relations turn into flows of different types of information, becoming more contradictory and disperse. The space also changes to support the network of our interactions. As M. Castells stated in the Rise of the Network Society – "there is a new spatial form characteristic of social practices that dominate and shape the network society: the space of flows"[16]. This space was defined by superposition of different material layers, the spatial organisation of the network, its material support and the nodes. While the first two are dominated either by user preferences or by technical dimension, the nodes take on the general role to unite both, being the points of intersection between the user and technology. The node is a place in the placeless space of flows, a place for exchange, a place where streams of people, goods, information come together, therefore being crucial to the whole network.

Ports are by definition the spaces of flows. They see different goods, people, information coming and going every day through them, witnessing countless exchanges and providing countless opportunities for new ones. For centuries the ports have been representatives of our need for a collective exchange in order to survive. And as the society is becoming more complex and connected, we can fairly say that the act of exchange starts to define it, meaning that the port typology turn into the main physical expression of this society. An airport is the most current type as the rapidity of exchange is the main factor.

Heathrow Airport advertisement for expanding the airport (3rd runway) stating that with growing Heathrow Britain's economy will grow

ECONOMICS

PART II

INTER-CONTINENTAL

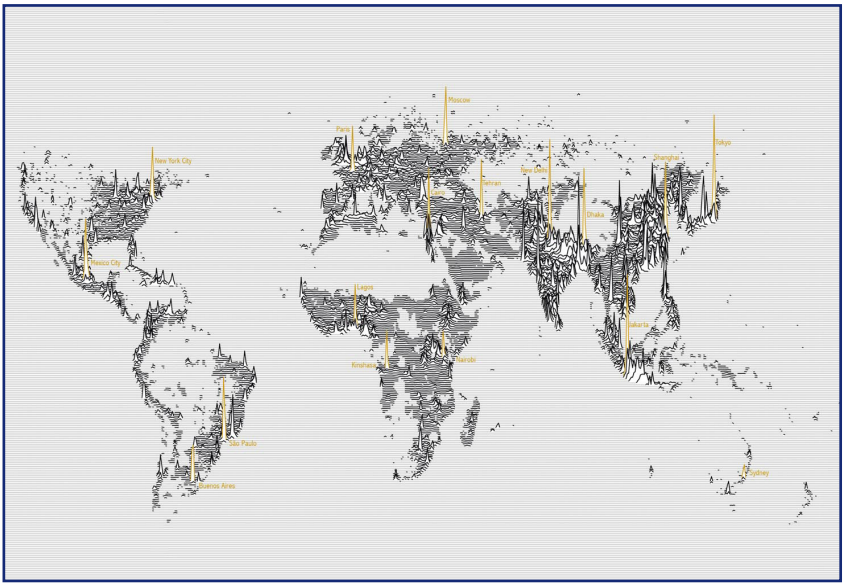
The emergence of the East

“The 20th century, far from being a time of western ascendancy, witnessed something more like a reorientation of the world and the decline of the west - not a decline in the cultural sense that Spengler envisaged, but relative economic decline, relative demographic decline and, above all, imperial decline”

article The Triumph of the East by Prf. N. Ferguson [17]

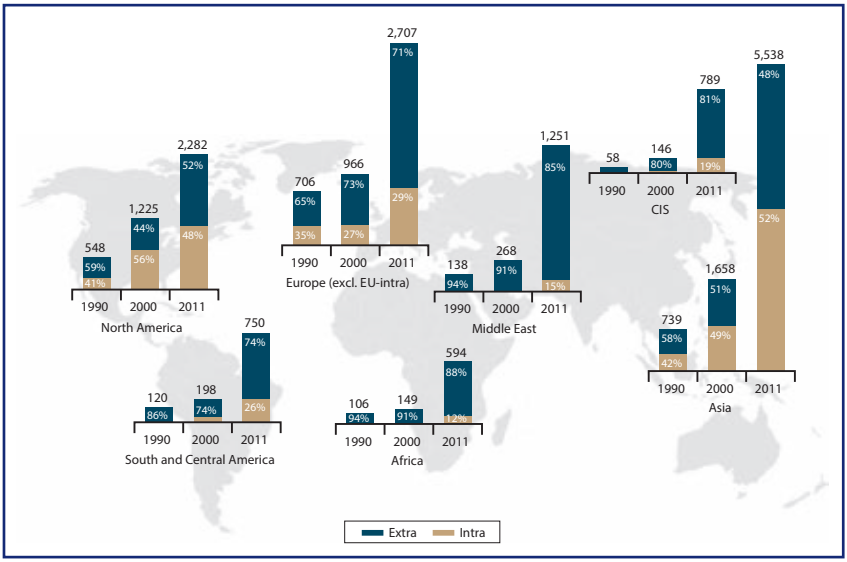
As the transportation has become more sophisticated and brought the world closer, it has globalised local markets, changing the dimension of the local from within a region to the scale of a country, or even continent, thus reinforcing the importance of transcontinental communication and exchange. Different enterprises have become global to stay competitive locally. They have separated the administrative part from production, as the workforce is cheaper elsewhere. This has led to interesting spatial segregation between continents such as the concentration of business and entrepreneurship knowledge and the concentration of the production capital in distinct regions.

The focus of this study is on the exchange between two continents - Europe and Asia – as Europe is a true treasure box of knowledge and Asia has been increasingly the source of a cheap man labour and skilled labour, that has recently seen a rapid economic development that is catching up with the Old World.
As we know, Europe has one of the longest tradition of formal education, dating back to the early middle ages, when catholic monasteries were the centers for teaching and preserving latin. Even up to this date, the oldest schools, originating in sixth-seventh centuries, are situated in England (for example King's School dates back to 567[18]). However, the European region is slightly pericentral, meaning that it has been fertile enough to have surplus to develop a complex society, but has always seeked for the ways to improve its production. This has resulted in a good education and exploration, which has led to the industrial revolutions originating in Europe, making it the center for knowledge and trade.



Population density by latitude | James Cheshire | spatial.ly 2014 [19]

Intra-regional and extra-regional merchandise exports of WTO regions, 1990-2011 (US$ billion and percentage) | World Trade Report 2013 [20]



On the other hand, with the liberation of the market in the 70's, the competition for production of goods became global, as well as the trade. Companies of various origins got a direct access to local markets all over the world, creating the competition like never before. The cost for labor varied greatly from one continent to another and prices for transportation were low. The regions which are known for the cheapest labour, or cheapest skilled labour, are also those with the highest population. They are situated in the East, particularly in China. This led to delocalisation of production from European grounds to Chinese soil, boosting drastically the country's economic development and therefore lifting people from poverty to create a more eased social class. The new social class has had enough of disposable personal income to spent, leading to the emergence of a more important market in China itself. When the economic crisis took place, the European markets have been affected more than Asian markets, reinforcing the latter's presence on the world tribune. Today, Asian countries have outgrown the intra-regional and extra-regional exports of Europe by nearly a double, and left other continents even further behind, signifying the importance of the Asian market on a global scale. This has led to the formation of the new economic centralities in the Far East, such as Shanghai and Hong Kong for finance, and Tokyo for stock market. These new world-wide polarities are becoming stronger and stronger as the Asian markets are growing.

Therefore, the importance of the exchange between the two continents of Europe and Asia has never been so great. Whilst Europe depends on Asia to supply its demand for goods, Asia needs the know-how of Europe to develop its markets, and more importantly, to be the new imperial power in the world.
Whilst one part of the goods' supply's value does not depend on time, other part, as well as the knowledge, due to their importance and weight-to-none, loses its value with time. To stay competitive, fast means of transportation and communication must be used. This is stressed by the quantity of passenger and cargo traffic going through the airports - this year nearly half of the top 20 busiest airports are in Asia, Beijing being second busiest in the world for passenger traffic, and Hong Kong being the busiest for cargo traffic[21].

NORTHEN WAY

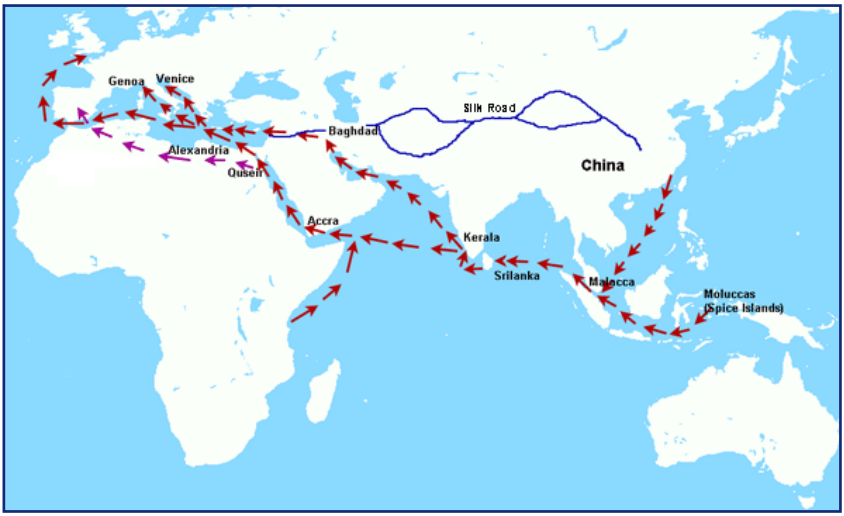
Adapting to the new mobility

“ The business world is in the midst of fundamental change and in the next decade the ability of organisations to manage their global talent efficiently will mark the difference between success and failure.”

ProcewaterhouseCoopers, multinational professional network [22]

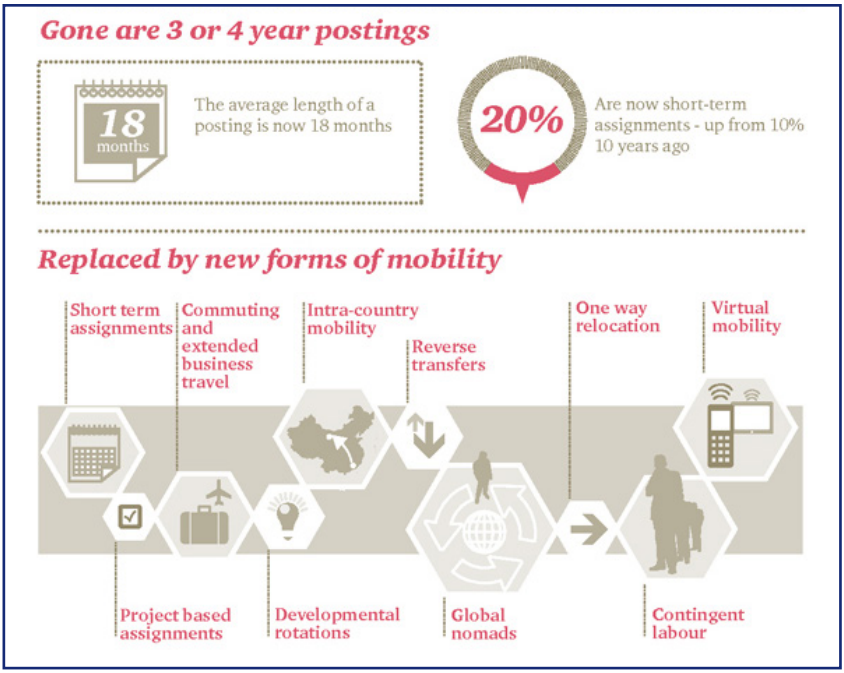
The communication between two continents, Europe and Asia has been centuries old.
It has resulted in two distinct routes, the Silk Way and the Spices Way. The Silk Way, dating back centuries, connects two distinct territories by going through the Middle East. Originally, as the name states, it was used to transport the silk, a material used for clothing and decorating (i.e. walls). The Spices way has been founded as an alternative to the previous one, as Middle East has claimed monopoly on the pass between Europe and Asia, making transportation exceedingly expensive. It contours Africa and India (inheriting from the latter its name), which at the time have consisted largely of European colonies, making the trajectory longer, but avoiding the monopoly of the Middle East. As previously, main export product was the silk, but also porcelain and pearls.

Today, the economical pattern between Europe and Asia persists, since most of the production is in Asia. So do the transportation trajectories. We can see how the more advanced modes of transportation, such as rail, maritime, air and truck networks, follow the Silk and Spice Roads. This is also accentuated by the location of the major container and cargo ports, as well as the positions of the special economic zones. We can see that the Air Transport follows mainly the Silk Road, to keep the trajectory as short as possible. The hubs such as Istanbul and Dubai Airports are the nodes that allow the reduction the price of travel between two parts of the world, bringing the number of flights from N2 to $2N^{23}$.



Silk (blue) and Spices (red) trade Routes | www.silkroutes.net [24]

Talent mobility 2020 and beyond | PricewaterhouseCoopers 2012 [25]



Both Roads stay south of Russia, leaving the north untouched. However, there is a growing demand for communication with northern parts of Asia, notably the capitals of South Korea, China and Japan, as they become the new financial centers. Most of the flights between those Asian cities and the European ones, such as London or Frankfurt, prefer taking a more northern trajectory to optimise the distance and the cost between the origin and destination points of flights. Meanwhile, the demand for air communication between the two continents is growing drastically. The airlines also fail to reduce the prices for travel – the flights are too long to offer low cost alternatives. However it is not only the prices that pose a problem - it is also the duration of flights. While it is clear that flight length was already an important factor for freight travel, recently it has had a growing importance for passenger travel as well. As the length of job posting abroad falls from 3-4 years to only 18 months, we can observe a global trend to shorten the terms of assignments. The companies, with growing virtual mobility and accumulation of experience abroad, need less of their headquarters members' presence in Asia, though they still have the need for meetings and conferences for important contracts and exchange. However, losing days on a plane and jet lag is not very efficient.
It is not only the business world that looks for a faster exchange, but also the society. As we have seen previously, a greater part of the demand for air travel is non-business related - studying, visiting friends and families. As more and more people work and study abroad, they are separated from their close ones. As they successfully establish themselves in the new environments, it becomes harder and harder to visit their relatives as the travel is too lengthy for just a weekend visit. Most of the time they are not looking to visit the place where they are from, as they know it way too well, but the people who are dear to them. A plane flight with a jet lag is too costly.

Therefore a need comes for a place somewhere in-between the two continents, which could reduce the length of the flight and of a jet lag of 10 hours. A place where one could stay, and spend his or her time with the people they need.

IMPACT

Implication of hub intallation on the region

“Le jeu entre infrastructures de service et de réseau a fait des aéroports et de leurs environs immédiats des lieux hautement attractives pour un grand nombre de sociétés à haute intensité cognitive, pour lesquelles proximités relationnelle et géographique sont déterminantes”

Habiter les aéroports [26]

The Airport can be an important catalyst for the economic region it is situated in because it is a place for exchange. It is especially important in the frame of today's economy, that becomes more and more dependant on knowledge, shifting from the secondary sector of work to the tertiary – so-called white collar jobs. As the competition is no longer local, but on a world scale, the rapidity of exchange is vital to the increasingly international companies to survive in the global market.
The proximity to an airport becomes an important point to consider when those enterprises chose a location to settle. An airport attracts the international offices by the connectivity it provides. For example, many international organisations in Geneva, such as WTO, have settled in the close proximity to the Geneva Airport, which, in turn, also hosts conference center. In Zurich, the location for a new business center, First District, is dependant on the proximity to the airport so far that they refer to it as a hub - "The new business district will be a hub that links the urban centres "Zurich airport" and "Zurich city", and functions as a magnet to attract businesses to establish a foothold here" [27]. Another example is Amsterdam, where this type of urban development has inverted the land price tendency - the land near the Schiphol Airport is more expensive than the center of Central Business District [A. Uriberger, 2012[28]]. The airports attract the companies for whom time is the vital factor for their daily transactions, as well as those whose expertise lies in the internationality of their enterprise and a regular contact with client.

This leads to an interesting phenomenon where the airport becomes a new urban centrality, that, like old parts of a city, attracts offices by the exposure it provides to the width of the world. Of course, the airports are built only if there is enough demand in the region in the first place. However, if they grow, the city will follow. Airports allow for cities to compete internationally as they attract the main economic sector of today, that is based on the intelligence and connections. The amplitude of their impact can be seen from the importance they are given in the financial capitals. Those cities that want to keep their function as financial centralities have invested, and keep on investing in their airports - Zurich, London, Hong Kong and others - as the airports are not only points of arrival and departure, but can also be the turning points in economical development of the region they are situated in.

VTB Capital Investment Forum Advertisement showing the globe to evoke the globalisation of investments. The logo imitates the rapid speed of travelling.

GEOGRAPHY

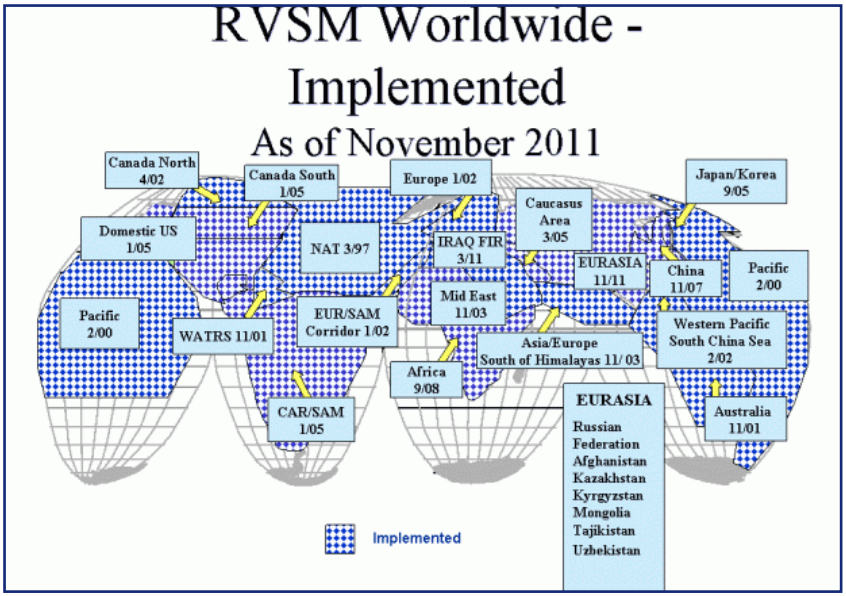
PART III

EUROPE-ASIA

travelling above Russian Federation

“Banning Western airlines could indeed pose a serious problem to them, given the fact that Russia is the world’s largest country in terms of land mass and is between East Asia and Europe.”

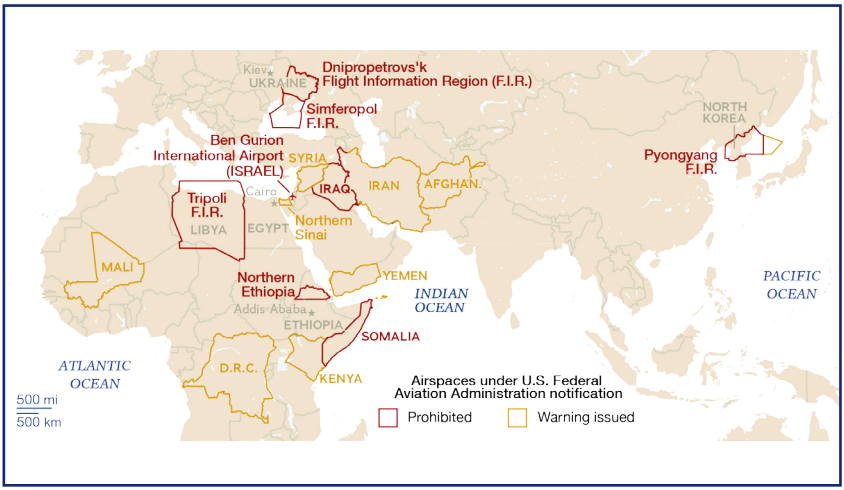
R. Noack for Washington Post, August 2014 [29]



Airzones of applied Reduced Vertical Separation Minimum | FAA [30]

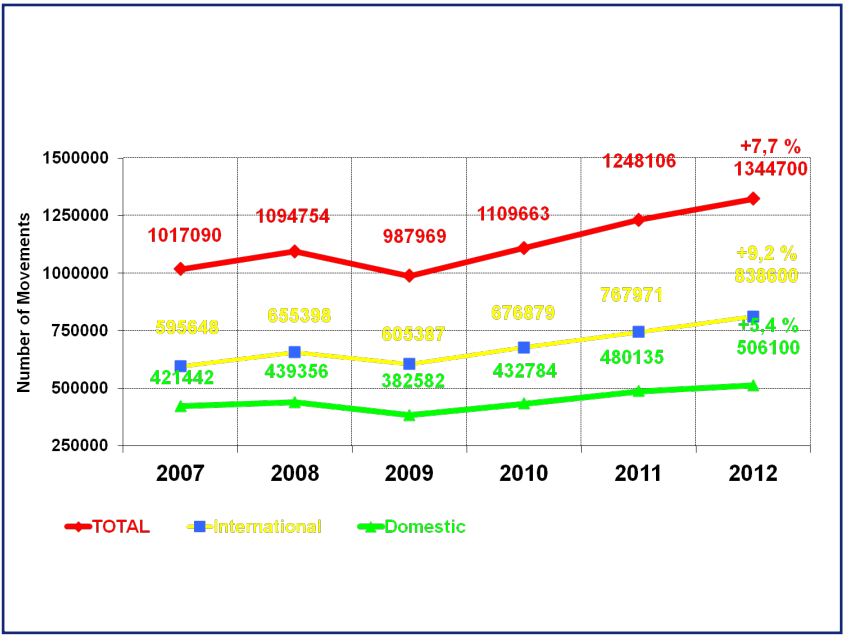
An important part of air travel between European and Asian continents goes though Eurasian Airspace, mainly the Russian Federation. With the recent events in Eastern Europe, there has been some speculation in the press about the closure of Russian airspace to European and US airlines. This has revealed how much the russian airspace is really used, and how much the airlines, especially european, could be affected. For example, the company most affected by a possible closure of this airspace would be Lufthansa, effectuating not only passenger but also cargo flights above Russia.

As we can see from the illustrations, this airspace is convenient not only by the length of travel - its shorter distance between Europe and Asia - but also by its unity and stability. If the flights have to take a more southern trajectories, they have to cross multiple airspaces, such as MidEast and Asia/Europe, whilst being in proximity to some of the most dangerous air zones such as Syria, Northern Sinai, Iran, Yemen and even the prohibited one of Iraq. With the recent events in the Middle East, where the persisting conflicts took a turn for the worst, for example in Israel and Syria, the security of the flight trajectories and ports situated in that region can be questioned.



Dangerous airzones | National Geographic 2014 [31]

Number of movements IFR flights | State ATM Corporation of Russia 2012 [32]



The extensivity of the unified Eurasian air space is remarkable as it boards both European airspace and the Chinese, Pacific, Japanese/ Korean and even Canadian air zones. The Eurasian space consists primarily of the one above the Russian Federation. If we look closer to the characteristics of the Russian airspace, we can see that it is approximately 26 million km2 (9 of which are above high seas) and is served by 69 centers of unified Air Traffic Management system of Russian Federation [ATM Corporation of Russia, 2012[33]]. It can also be observed that the demand has increased over past years - by one third from 2007 to 2012. An important part of those flights are not landing in Russia - the most important operations being between Europe and Japan, north-west China and South Korea. The importance can also be highlighted by the williness of the foreign carriers to pay over-flight charges imposed on them, which generate an important income for the main air company, Aeroflot. These royalties, around US$ 170 million, make up 18% of the Aeroflot's full-year income [Bloomberg, 2014[34]]. The economical benefits were also highlighted by the Lufthansa Cargo, one of the world's leading cargo carriers, who tried to resist the charges imposed on them by relocating their technical stopover point from Siberia to Kazakhstan. However, after a careful consideration the company has relocated their hub form Astana, Kazakhstan, back to Krasnoyarsk, Russia, to optimise their costs [Luftansa Cargo, 2009[35]]

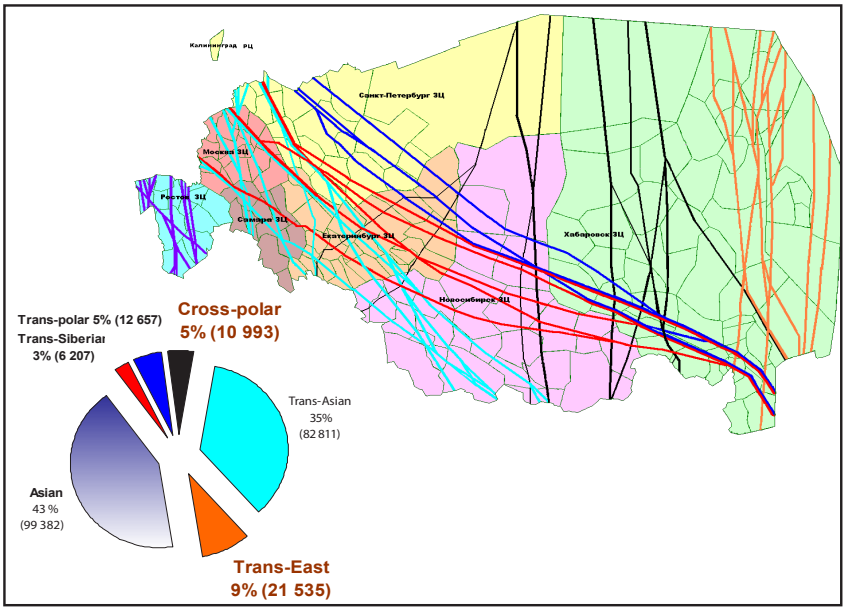
As Washington Post and Bloomberg have highlighted, the air travel above Russian Federation is not only beneficiary for the companies operating the flights, but also for Russia itself.

TOUCHGROUND

Siberia as an intermediate space

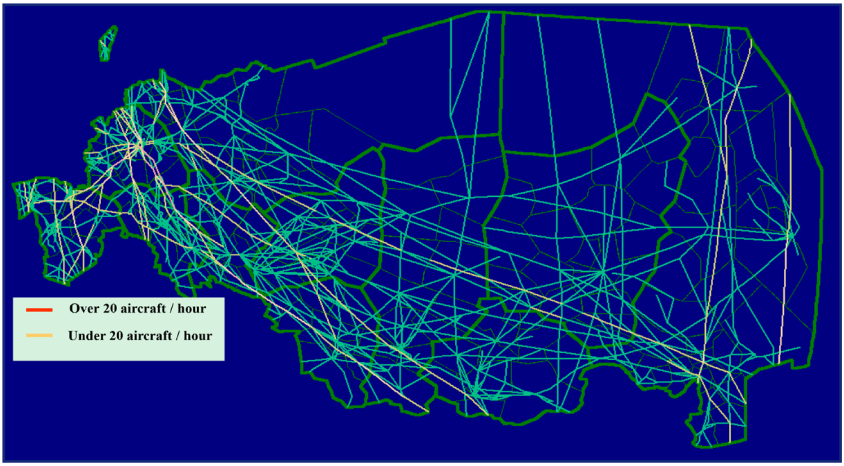
“A vast region of Russia that extends from the Ural Mountains to the Pacific Ocean and from the Arctic coast to the northern borders of Kazakhstan, Mongolia, and China. Noted for the severity of its winters, it was traditionally used as a place of exile; it is now a major source of minerals and hydroelectric power”

Oxford Dictionary [36]



Main ATM Routes Networks | State ATM Corporation of Russia 2012 [37]

The dominating portion of flights across the Russian Federation occurs above the Siberian region, which accounts for more than a half (57%) of the country's land surface [Vokrug Sveta Encyclopedia[38]]. Most of the trajectories follow the Europe-Asia route, and have a frequency of above 20 aircrafts per hour. Though the region is located on the Asia continent, it is situated in-between origins and destinations of trans-continental flights. For example, there are 9603 air kilometers between Tokyo JP and London UK, and 4824 air kilometers between Tokyo JP and Novosibirsk RU [airmilescalculator[39]], meaning that the latter is situated around halfway between Japan and United Kingdom. This territory hosts already international hubs for cargo transportation in Krasnoyarsk, and is seeing developments in the airport of Novosibirsk for online retailers and post. Today Siberia finds itself in the middle of cargo and passenger communication between Europe and Asia, though once it has been a place for exile because of its lack of accessibility at the time and the severe climate.



Number of Aircraft Flights along ATM Routes | State ATM Corporation of Russia 2012 [40]

Title page of the album Great Route. View of Siberia and its railyways. Krasnoyark 1899 | Siberian Unrbanism 2011 [41]

Siberia has always been somewhat disconnected from the rest of the country because of its remote distance to the capital and its vast land size. It has resulted in a small population and the main preoccupation being in the primary sector before twentieth century. The difficulty of access to this part of a country, which made hard any territorial development and assimilation, has been addressed quite radically by building the trans-siberian railway in 1891-1903. This infrastructure has allowed for a "second" assimilation of the territory - it woke up the territory as Mendeleev has said, boosting the population from 7 million to 20 million and drastically increasing the number of factories, though not their size. The influence of the trans-siberian railway, and other smaller railway infrastructures in the east of Russia, has crossed the borders of the country, stimulating the economy of northern China during the first half of the twentieth century [Tsarev, 2011[42]].

Another important development strategy has been applied during the existence of Soviet Union. The government has decided to rapidly modernise the Siberian region through a massive installation of large factories and industries. The main preoccupation of the siberian citizens has been radically changed from agricultural to industrial. The region has also seen the installation of the enterprises of strategic importance during the world wars because of its remoteness to the fighting areas. That, in turn, by their technical sophistication, boosted the education of the region [Tsarev, 2011[43]].

POTENTIAL

Identifying the region with the most potential

".. In Siberia there are lasting, pledge by all course of historical development, premises for the rational organisation of cities: unique natural landscape conditions, situated on large railway, highway magistrals and navigable rivers, presence of vacant territories, proximity to the promising minerals' deposits and to the territories of concentration of naturally recreational resources"

Siberian Urbanism [44]

The region beyond the Ural mountains, famous for its natural resources, is also rich in infrastructures as well as the well educated population of mixed origins.
Siberia, known for rough weather conditions during winter, has been mainly populated after the installation of the great siberian (trans-siberian) railway, meaning that most of its population are immigrants from other parts of the Russian Empire. Another wave of immigration has come during the Soviet Union. Both immigration waves have been encouraged by the disponibility of land and job opportunities, that have been much harder to obtain in the western part of the Russian Empire and Soviet Union. Another motivation has been the richness of the region, spectacular landscapes and clean ecology. Today, even though most of the population is of Russian origin, there are other numerous nationalities present such as Latvians, Estonians, Germans, Ukrainians, Tatars, Kazakhs, Polacks , Juifs, Romanians, Bashkirs, etc.
The population of the region is also well educated. The goal of Soviet Union has been to increase the literacy all over the country - there has been countless schools opened all over the country, as well as numerous universities and other educational post-high school facilities. The main polytechnical school in Novosibirsk, today Novosibirsk State University, has been, the Siberian equivalent to Moscow State University, competing with the later in the science domains ever since its opening. Today in Siberia there are also a number of technoparks that specialise in advanced technologies and try to keep the young specialists home.
This shows that the region has the potential to attract and allow the installation of an intercontinental hub, not only in terms of the natural resources, but also in terms of human resources, that are skilled and international.

The following map shows the important infrastructure of the region[45].

TRANSPORT INFRASTRUCTURE OF RUSSIA 2010-2030

1 : 12 000 000

1 : 24 000 000 si format A4

TRANSPORTATION NODES
- Largest
- Other

ROADS

In service
- Federal
- Main
- Crossing passages

Reconstruction
- Renovation
- New construction
- Renovation
- Renovation of federal roads

RECONSTRUCTION OF EXISTING ROUTES
- Sections
- Temporary
- Construction of new railways after 2030

WATER TRANSPORT
- Игарка 2000
- Navigation canals
- Sea ports
- River ports
- Canal construction


AIRPORTS
Int. nodes
International
Other
TRANSPORT CORRIDORS
North-South
N-S after 2010
Transib
Transib after 2010
Seaside
Reconstruction of roads in the corridor West Europe - West China
Восточно-Сибирское море
Новосибирские острова
Ляховские острова
о. Котельный
о. Новая Сибирь
о. Бельковский
о. Бол. Ляховский
о. Айон
Медвежьи о-ва
Мурманск-Владивосток 10400, Архангельск-Владивосток 10600
Провидения 3000
Мурманск 3660
Певек
Анадырь
Беринговский
Марково
Кепервеем
Черский
Омолон
Тиличики
Чокурдах
Нижнеянск
Тикси
Белая Гора
Усть-Куйга
Депутатский
Батагай
Зырянка
Сеймчан
Мома
Усть-Нера
Нелькан
Жиганск
Магадан
п-ов Камчатка
Соболево
Усть-Камчатск
Ключи
Тигиль
Палана
Оссора
о. Карагинский
Хандыга
Охотск
Якутск
Вилюйск
Верхневилюйск
Нюрба
Мирный
Усть-Мая
Охотское море
о. Ионы
Аян
Олёкминск
Ленск
Алдан
Нерюнгри
Чара
Мама
Бодайбо
Таксимо
Тында
Чумикан
Шантарские о-ва
п-ов Шмидта
Оха
Николаевск-на-Амуре
о. Сахалин
Ноглики
Александровск-Сахалинский
Де-Кастри
Полины Осипенко
Комсомольск-на-Амуре
Ванино
Советская Гавань
Поронайск
Шахтерск
Холмск
Южно-Сахалинск
Корсаков
Невельск
о. Монерон (Россия)
Сковородино
Зея
Свободный
Благовещенск
Новый Ургал
Биробиджан
Хабаровск
Известковый
Чита
Агинское
Борзя
Забайкальск
Чернышевск
Сретенск
Нерчинск
Дальнереченск
Пластун
Кавалерово
Ольга
Сибирцево
Уссурийск
Находка
Владивосток
Славянка
Посьет
Японское море
о. Хонсю
Китай
оз. Далайнор (Хулун-Нур)
Петропавловск-Камчатский - Мурманск 8100
Петропавловск-Камчатский 2400
Владивосток 2700
Хакодате 700
Шанхай 1840
Вонсан 630
Одесса 17500

RÉSUMÉ

The social, economical and geographical aspects, though separated above, are, in reality, very linked and intertwined. The technological advances have changed both the society and the economy and these changes are reflected on the world's territory. As the perception of the physical space and the communication are measured with other units of time, the society and the economy has dispersed itself over the world, becoming more and more global. Rather than being attached to singular spatiality, they became dependant on flows and their rapidity. The access points of these flows has turned into polarities, attracting the international, financial and other knowledge-based organisations. The search for interpersonal contacts, whether for business purposes or private ones, has accentuated the temporal dimension of the flows, craving the faster transportation systems.
The aviation has enabled for more rapid exchanges, and as both the society and economy have become more global and fluid, the airports became the articulation points of these factors on the land. This study has concentrated on the intercontinental exchange of Europe and Asia, following the latest tendencies of concentrations of flows, whether it is goods, or people. To ease an exchange between the two it proposes an intermediate articulation point in a region rich with potential, Siberia. Thus it drives the need for the instant personal contact to the extreme, where it becomes negotiation between the time for travel and adaptation, and the attachment to the physical context.

WRITTEN AND EDITED BY ANNA KOSENKO | JANUARY 2015 | MA SAR EPFL

OBJECT

_*OBJECT*

1 A material thing that can be seen and touched
1.1 A thing external to the thinking mind or subject
2 A person or thing to which a specified action or feeling is directed
2.1 A goal or purpose

Oxford Dictionary [46]

OBJECT

PART I
GATEWAY

PART II
MICROWORLD

PART III
ALLUSION

The longest distance between two points.
Jorge Macchi. 2013. Exposition in Kunstmuseum Luzern.

GATEWAY

PART I

TRANSITION

Crossing the boarder

“Les aéroports ont toujours fait office pour les villes .... Il leur incombe ainsi la fonction de gateway, fonction qu’occupèrent, des siècles durant, les portes de la ville, los ports ou les gares.”

Societies and Cities in the Age of Instant Access [47]

As Koolhaas states in his exhibition of Fundamental Elements in Venice in 2014, airports, like other infrastructure stations, represent the equivalent of a city's gate[48]. However, contrary to the other modes of transport, the reach of the air traffic is far greater. It is more than the door between different localities. It is a pass between the local and the global, connecting different scales. When an airport is perceived only for its primary function, a getaway, the process of transition is different. It is much more brutal and more limiting.

Harsh transfer

Contrary to the other modes of transport you cannot observe the changes because the air travel is disconnected from the ground. In the morning you can be in London and it's cold and rainy, while in just a few hours you can reach Morocco, where it's hot and dry. In the transition you do not observe the *défilé* of the landscape like you would, for example, on a train or a car trip. It is insensible of the possible smoothness of the passage which has the touch of fear of death to it. The airport accentuates the brutality, as it was conceived as an aeronautical infrastructure for take-off and landing of the airports [A. Thierstein, S. Conventz, 2012[49]]. This *gate* is not conceived nor to be local, nor to be a gentle transition from the globalised experience you have just lived. This gate is conceived to be strong and secure. No longer being made out of stone, but relying on metal and technology, it is an infrastructure without much attachment to the locality it is situated in. This gate is more sophisticated than ever before, having to treat much greater volumes of traffic, the latter becoming more and more diverse. Passengers and goods are separated into various flows, depending on their provenance, volume, type, etc., to be controlled. Only when you finally pass through the gate, and exit outside, you are once again in local dimension. The climate and the nature outside indicates that you have arrived at your destination. The transfer from one place to another is very immediate and brutal action.

Up in the Air | DW Studios 2009 | IMDb 2009 [50]

Up in the Air | DW Studios 2009 | IMDb 2009 [51]

The flow

As you go through the airport, you accept to be completely limited from any contact of the outside world and to be completely guided in your movements. This place constraints you completely in exchange of the freedom of access, the ability to travel anywhere within hours, the connectedness to the multiple locations across the globe. You are classified to gain access to the other side by your origin, sex, income and others.
Different terminals for international and domestic flights, as well as private and public aviation, special zones for diplomats, the airline lounges and blue-silver-gold cardholders…
Though that inequality of treatment would strike us when we are at the origin or destination, we accept it readily in the passageway. The right to access the airport is already seen as privilege, a pre-selection of travellers - those that can afford the flight in terms of time and money. The feeling of belonging to an elite, given by the right to pass the control, and the temporality of passage induces the passengers to comply to the brutality of the segregation.

«... Why would you need something in the airport? it's just a transition space; the clien just commes, passes the control and flies; there is nothing more to it, no need to have architects here. ...»

a thought of an entrepreneur whose company handles the pane services, when told about the diploma theme | Moscow, November 2014 [52]

CONTROL
A streched door

“Antiterrorist measures turned the airport into an electronically controlled environment rivalled only by the maximum security prison”

p. 238, Naked Airport [53]

The airports are very vulnerable to security issues such as terrorism and hijacking. Though at first the air travel was presented as a dream – breaching the sky to reach your destination within hours – soon it became a place where danger prevailed. In 1970's, as we can read in Naked Airport, there were more than 400 international hijackings, and a few fairly bloody incidents because "airline terror became the fastest way for extremists to gain global attention and advertise their cause" [A. Gordon, 2004[54]]. Therefore the security is the main preoccupation of air transportation, having a huge impact on the design of the airports, whose transparency became the assurance of safety. The procedure to board an airplane has become a series of controls, ranging from pre-travel to customs, with the most important being the security access because of the physical aspect of its invasiveness. The appendix 1 (p.126) shows the stages of the security control and advices to avoid a more thorough one, illustrating its importance. The security control became the true entrance into the world of air travel, forever dividing the airport into two zones – airside and landside.

Scanning

At the beginning the scanning was very invasive, as with the lack of technological equipment it had to be done manually. The control was very intrusive and offending – every passenger was considered a potential criminal.
Today the passengers feel less aggressed as the scan machine comes between them and the security workers. Yet they are still being watched as potential criminals. Even though the technology has put distance in-between, it allowed the check-up to be done on a much more profound level – down to your bones. Passing through the scan has become something natural. Today the access to the information and the exchange platform such as Internet means the openness of the data transmitted. Thus people are adapting their sense of privacy to correspond to the exposition required to gain the accessibility. The travellers accept the check to be this profound since it is indirect. Moreover, by passing through the scan they enter a privileged zone that not everyone can access.

Passenger Facilitation Program | IATA 2012 [55]

01 PRE-TRAVEL	02 TICKET ISSUANCE	03 CHECK-IN	04 DOCUMENT SCANNING	05 AUTHORISATION TO PROCEED	06 BAGGAGE PROCESSING	07 IMMIGRATION EXIT CONTROL

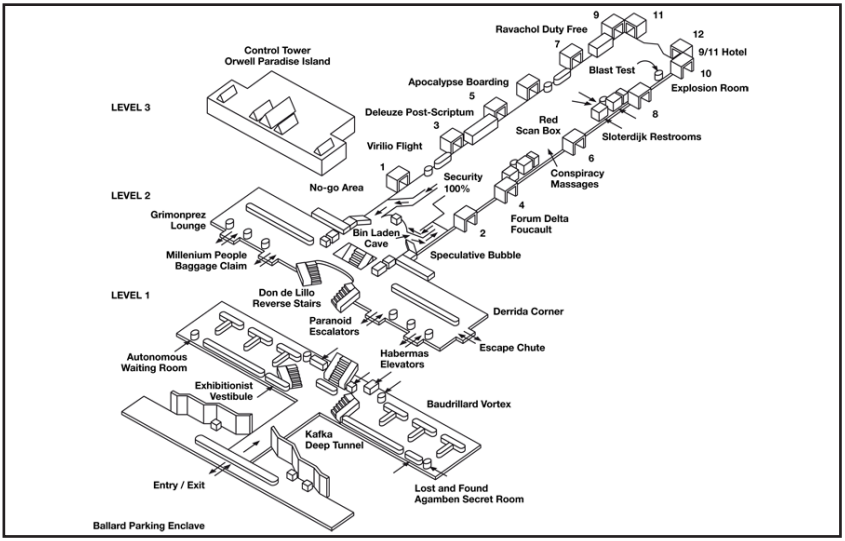
DOCUMENT CHECK

The american airport security system | DOOR by Koolass 2014 [56]


identify
passport control
identify
luggage scanner
impede
pat-down officer
single strap queuing
stanchions
anti-fatigue mat
blue nitrile gloves
bin cart
composure bench
bag search table
identify
explosives and narcotics detector
garbage bins for
contraband material

«Air Riders Take Search in Stride.»
Metal detectors go into service at Laguardia, 1973 | p. 235 Naked Airport 2004 [57]

Terrorism Museum plan | Stéphane Degoutin, Gwenola Wagon, 2009-2013 [58]



«A noiseless, unchecked progress through the detectors allowed one to advance into the rest of the terminal with a feeling akin to that one may experience on leaving church after confession or synagogue on the Day of Atonement, momentarily absolved and relieved of some of the burden of one's sins»

A week at the Airport [59]

Surveillance

Once passengers have passed the scanning, they tend to forget to which extent we are still being watched and controlled. The travellers relax as they feel secure – somewhere, in the back of their mind, knowing that they are being constantly watched. They trade their liberty for security, for that moment of safety, or even more – a right to be ignorant. In the airspace there is no privacy – every corner is watched. The access to every space is controlled.

«Peut aller très loin dans les dispositifs d'oppression sécuritaire, plus loin que nulle part ailleurs en ville occidentale, plus loin dans la manipulation et la contrainte des corps. Dispositifs acceptés sans broncher car le prix à payer n'est jamais trop élevé pour assouvir le désir de réaliser la fantasme d'omniprésence. Personne ne refuse les dispositifs sécuritaires.»

Infiltration Technologique | Stéphane Degoutin, Gwenola Wagon, 2010 [60]

REPRESENTATION

from where we are coming and where are we going

«... l'idée paradoxale d'un aéroport qui, selon le maître d'ouvrage, devrait témoigner d'une identité dont l'image serait l'expression de la singularité d'un territoire er de ses populations situées géographiquement et culturellement.»

Habiter les aéroports [61]

The Airport, as stated in *Habiter les aéroports*, plays the key role to the first and last impression of the city. An airport is more than a simple door you go through once you breach the incredible distances by air. Travellers are thrilled by an airport just as much as when they have been by the gates in a continuous fortification around the city which they have reached after days of travel. It is a transitional point between two realities that gives you a glimpse of what's about to come, and not everyone is allowed to continue on to the other reality. It represents the world beyond by being in the world of here.

The place – what's beyond

The question is also that of the representation - what do we enter into? How do we know it's the entrance?
As the citation of Koolhaas in the Door states[62], the entrance had to be more than just a passageway. It holds the symbolic significance. The airport bears the weight of the representation of the territory it is situated in, all while expressing the world beyond – the multitude of the destinations, the easiness of their accessibility. Even if this portal is subjected strictly to international standards, being an apotheosis of security and engineering regulations, it is still expected to bear a trace of its context, that would differentiate it from many others around the world. This local signature can be seen through the engineering solutions dictated by the climate present and constant extensions, improvements are made to respond to the increase in the flow. This makes an airport a vernacular in its essence. However it is buried deep inside it and cannot be seen directly, so an airport is not recognised as such.

«… Nowhere was the airport's charm more concentrated than on the screen placed at intervals across the terminal … These screens implied a feeling of infinite and immediate possibility … The lack of detail about the destinations served only to stir unfocused images of nostalgia and longing …»

A Week at the Airport [63]

Departure and Arrival Board in the Trans World Airlines Terminal, John F. Kennedy Airport, New York, circa 1962| architect Eero Saarinen | The Daily Mail 2012 [64]

The interior of the Trans World Airlines Terminal, John F. Kennedy Airport, New York, circa 1962| architect Eero Saarinen | The Atlantic 2013 [65]

Two worlds

The main transition of the airport is that between local and global culture. It is a point of exchange between the latest technologies, discoveries and the local culture, whose identity is distinct from other places in the world making it a valuable exchange to be made.
However, the question is: how do we define local in the century where there is a hybrid of geographical territory and cyberspace? We can no longer just talk about the local as being a small geographical entity such as a village or a region. Our mobility has blurred the clear geographical limits meaning that the negative cannot define the local, as it has been done before. It is no longer in the opposition to the global culture, but rather its precision. The local, as P. Musso writes in *Société éclatée: Le retour de l'objet local*, is a node floating in the network, and therefore is also defined by the network, and therefore must be considered on a much bigger scale[66]. It becomes more global, and its identity often lies in precisions such as cultural habits or cuisine, rather than a physical expression. Henceforth the physical expression has a more globalised character, becoming some type of liquid sterile architecture.

Check-in hall.
Denise Bertschi. 2012.

MICROWORLD

PART I

ERASING BOUNDARIES

Air transportation connecting continents

“There are also .. real places, effective places, … , a sort of effectively realized utopias, in which the real emplacements, all the other real emplacements that can be found within culture, are simultaneously represented, contested and inverted; a kind of places that are outside all places, even though they are actually localizable.”

Of other paces (1967), Foucaust [67]

As the stakes of exchanging information become bigger, the airport, once being considered as a mere threshold, becomes more than just a stretched door. It is no longer a transitional space without identity, but a piece of urbanity, which is just like a place, a boulevard or a street in the city. Some travellers pass by, while others stop for a coffee or pop up to a shop last minute souvenir before the flight.

Buffer zone

With time, an airport became more than a limit to pass. After going through the numerous controls and actually flying off, it offers a transition space. The travel from origin to the destination is no longer an abrupt experience. A passenger has *an intermediate zone* which, through isolation, offers him a possibility to reflect on the travel, in a certain way to take a break before boarding on a plane and going to the destination with an inhuman speed. This place is not completely isolated; it barriers the traces of the locality it is situated in – the types of goods in the shops, food in the cafes, one of the languages of the airport… Small objects remind the passenger where is he is coming from, whilst the overall brutality of the building evokes the jump he's about to make.

«… the period before boarding an aircraft is still statistically more likely to be a prelude to a catastrophe than a quite day in front of television at home. It therefore teds to raise questions about how we might best spend the last moments before our disintegration …»

A week at the Airport [68]

Waiting for boarding | Gatwick Airport | by the author 2014

The Terminal | DreamWorks 2004 | IMDb 2010 [69]

Paradox of Anonymity

As the Airport became more complex, air travel has been separated into numerous flows for better efficacy, as well as security. However, once the passengers enter the *Duty-Free* zone, and before they go to the gate, they are all reunited. Whilst every single passenger was identified to enter this zone, once they are inside, stripped down of big suitcases, they are without identity – just one among many others who travel. This anonymity has already started when the passenger passed the security control, where he or she was scanned without any prejudice or exception. On this side, nothing can definitely indicate where exactly they are going nor where they are coming from, aside the careful observation of travellers in front of the departure board. Even then, it is where these people are going to, not coming from. No past of passengers is shown. In the world where every connection is identified and stored, either by the Internet or surveillance cameras, where any part of your life can follow you to any part of the globe, the space beyond the security control offers the traveller a moment of anonymity before his or her flight. You are just one among others, and once you are gone, no trace of you will be kept. It's a space containing thousands of stories, some more exciting than others, some more private than others, but they continue to flow one past another, rarely touching or leaving a memory[70].

MACHINE

The complexity of a functioning airport today

“The time is near when men will receive their normal impressions of a new country suddenly and in a plan, not slowly and in perspective; when the most extreme distances will be brought within the compass of one week’s – one hundred and sixty-eight hours – travel; when the word ‘inaccessible”, as applied to any given spot on the surface of the globe, will cease to have any meaning”

Naked Airport [71]

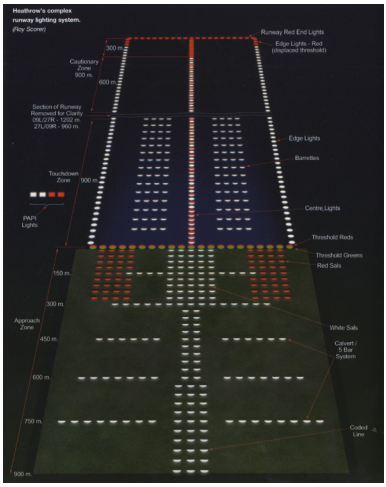
The Airport today does not consist simply of a one building and one security control, but it has a complex structure including multiple objects for different functions, each hosting various levels of controls. In such a complex system the question of the language has become crucial, as the companies exploiting the airport are diverse in domain of expertise and international in stuff as the passengers that are travelling through. It is important, in the communication between different airport workers and passengers, not only to use a common language, that by default is English, but also the right vocabulary and the visuals - the time is at stake, so the efficiency must be at its most.

Guidance

As the airport becomes a complex functioning machine, the passengers need the guidance more than ever. Just like the sophistication of technologies led to the simplification of the interface to keep a large panel of users, so had the visual and textual communication in the airport. The importance of flow management has grown with the demand, resulting in complicated designs, that led to the confusion of passengers. Therefore the circulation became more directed by the physical and visual elements: separations, escalators, screens, signs, indications on the floor and others. Both the passengers and the aircrafts are guided carefully through the airport by using three main categories of communication: sound, visual and textural.
The communication by sound is done through the announcements and general communication through microphones, whether it is to guide a passenger who is running late, or an aircraft to its parking slot. The verbal transmission is accompanied by distinct sounds to attract the attention to those whom it concerns. The sounds are very important as they are universal signs to solicit one's awareness, whether for an announcement, or to keep away from danger, i.e. moving objects.
The visual communication consists of physical objects and signage. Physical objects such as fences, air bridges, stairs, separations and others, orientate the pilots and travellers. The signage communicates information through three types of expression – colour, pictogram (arrows included) and written information. Lights are also an important way of communication, as they can be both passive and active. A lighting system and air marshaling guide an aircraft, whilst bright signs, different light solutions and on-line screens direct the passengers.
The textural communication is done mainly by the different types of floor coverings and different materials on the ground, as well as hand rails, a raise of a part of a floor, and other classical architectural and technical solutions.

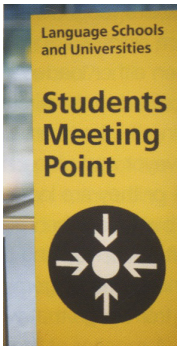
VISUAL COMMUNICATION

Runway



Lighting system on the ramp and air marshaling

Terminal



Different types of separation and lighting systems guide the passengers

_Credits: Heathrow Airport: Operations Mauel and photo by the author (Beijing) [72]

Pictograms by No-Nonsence Design for Gatwick Airport [73]

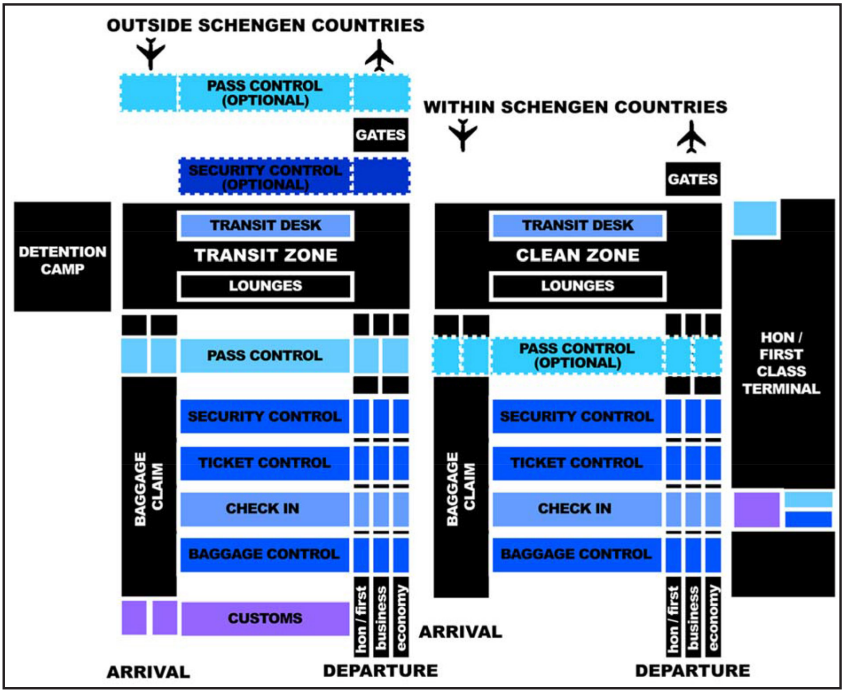
Signs and different type of ground covering guides the aircraft once landed

The different types of signalisation

VERBAL COMMUNICATION

The official language of communication in the airports is English, and as we can see from the glossary of items for passengers, the vocabulary used is regulated by IATA. This is made to simplify the communication and to avoid any possible confusion. There are also a series of abbreviations and codes to speed up the process of exchange.

"Tunnelling Effect" at airport thresholds (M. Codourey, 2005, Diagram) [74]



_Extracts from Glossary of items for Passengers, IATA [75]

Accompanied

_When used for children and infant fares, this shall mean the child/infant must be accompanied by an adult paying an applicable adult fare or traveling at industry free or reduced fare tickets

Accountable Document

_ As defined and used by IATA in the IATA PSCRM Resolutions Manual: «A paper ticket, electronic ticket, paper miscellaneous charges order (MCO), electronic miscellaneous document (EMD) or any other Accountable Passenger Traffic Document, whether issued or not.»
For further clarification of the definition, Accountable Documents includes those documents that are identified in IATA Recommended Practice 1720a Standard Thirteen-Digit Numbering System for Traffic Documents. Other names: Accountable Traffic Document, Accountable Passenger Traffic Document, Traffic Document.

Aircraft

_ A transport vehicle which is certified as airworthy by a competent aeronautical authority. As used herein, the definition may include surface vehicles, the bookings and traffic handling for which are dealt with in a similar manner to that used for aircraft, e.g., rail or ferry.

Airport Terminal

_ All building used for arrival and departure handling of aircraft. For multiple terminal airports, the terminal identification used for a flight. An individual airline will operate flights into/out of specific terminals in a multiple terminal airport.

Baggage

_ Equivalent to the term "Luggage". Articles, effects and other personal property of a passenger as are necessary or appropriate for wear, use, comfort or convenience in connection with his trip. Unless otherwise specified, it includes both checked and unchecked baggage.

Boarding Pass

_ Document issued to a passenger to enable access to an aircraft. These may be issued at airports by Airports Council International (ACI) or Departure Control Systems (DCS), in advance by travel agencies or airlines, or by other means such as kiosks, internet or mobile devices. Industry standards control the content and format of a boarding pass.

Cargo

_ Any goods carried on an aircraft and covered by an air waybill.

Check-in

_ The check-in process involves those activities necessary to evaluate passengers and make them ready to board flights. It also includes management of flight activities immediately before and after a flight has been dispatched from a gate, and other tasks associated with the handling of passengers in transit. Check-in activities can be performed at airports or at a remote location. Check-in can be performed by humans or by machines (self-service devices such as kiosks).

Class

_ Segregation of passengers according to the fare paid or facilities and services offered.

Gateway

_ First point of arrival/last point of departure in a country/area.

Passenger

_ Any person carried on an aircraft and covered by a ticket.

Ticket

_ The document entitled "Passenger Ticket and Baggage Check" issued by or on behalf of the carrier and includes Notice of Contract Terms Incorporated by Reference and notices and the flight and passenger coupons contained therein. The document may be paper or electronic.

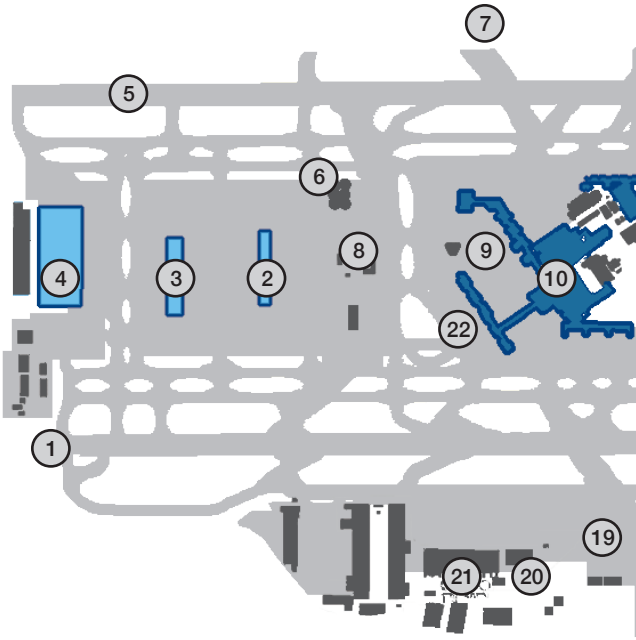
Traffic Document

_ Ticket, electronic ticket, MCO, EMD or any other accountable passenger traffic documents.

Anatomy

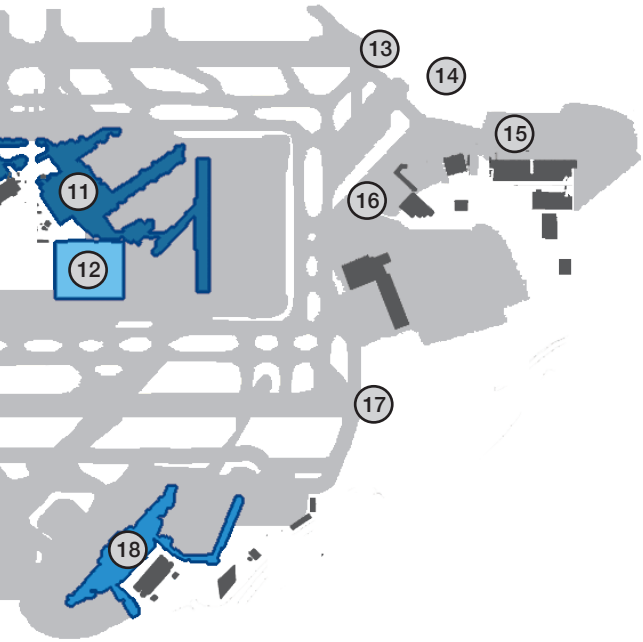
Let's take a Heathrow Airport as an example. The site contains a number of buildings, whose functions range from security purposes to the flow management. As we can see, the entity present the most is the terminal, which is dedicated to the flow management and is actually used directly by the travellers.

This entity is quite complex itself, as it has to host a number of controls, ranging from initial security control into the airport up to the boarding pass control during boarding.



The Aerial View of Heathrow Airport | Google Earth | based on «Heathrow Airport: Operations Manual» [76] | credits Iakovos Papaiannou

Legend:	
Runway	*1, 5, 13, 17*
Terminals	*2, 3, 4, 10, 11, 12, 18*
Fuel Farm	*6*
Compass centre	*7*
Fire Station	*8, 14*
ATC Tower	*9*
Snow Base	*14*
Maintenance Area	*15*
Fire Training Ground	*16*
VIP Suite	*19*
Cargo	*20, 21*
Airside Safety Department	*22*



5

TO BE OR NOT TO BE

Blurring the sense of time

“Amelia: Are you coming or going?
Viktor Navorski: I don’t know. Both.»

The Terminal [77]

Humanity has long longed to master not only the space surrounding us but also the time. We kept developing and inventing to shorten distances separating us, creating different transport machines to converge time and space. An airport offers a unique opportunity of different time perception, as it is a station for the mobility of inhuman speed that allows the travellers to cross the time zones within hours or even minutes. The difference of the sense of time in the airports' landside and airside is striking. The landside still bares the local time, whilst the airside is an intermediate space between the local time, where every minute we live corresponds to a physical dimension we can perceive, and a few hours in an aircraft, where our time passes differently to the one on the ground.

Pause

Once the traveller passes to the airside of the terminal, he finds himself stuck waiting for his or her boarding. Being limited physically in his accessibility, he becomes a prisoner of the airport time. Some do everything to avoid this different perception of time. They refuse it, assuming that the time is lost, arrive at the last minute possible and hurry through the building to their plane. Others use it or don't mind it. They prefer to avoid stressful situations. Certain try to use it. They are grateful for this pause in their chaotic lives, using it as an excuse from the connectivity that follows them everywhere, from their own identity. Even if this can be an incredible opportunity for a serependity contact, some prefer to keep the anonymity and privacy of their past for this short time the count of which nor depends on them, nor on the people they know. In an airport there is space for all of them under one roof.

The Terminal | DreamWorks 2004 | IMDb 2010 [78]

The Terminal | DreamWorks 2004 | IMDb 2010 [79]

Paradox of Accessibility

The connectivity for one inside the airport is incredible. The traveller can take any of the planes that are flying from an airport to another part of the country or the world. The Internet amplifies this effect – he or she can reach anyone as long as they have a connection. However, physically, every passenger inside is limited. There is no free access to the outside world – it is strictly regulated and controlled. The traveller is not only limited in his access to the outside but also inside. The cold architecture of the Airport is not made to accommodate him or her for a long time – any human presence here was meant to be momentary. However, by simple human presence, the traveller starts to appropriate space, creating his or her special spatiality in this constant anonymity. Even if one tries to stay anonymous, the choice of limiting one's presence in a space gives it an identity. When the time of waiting is increased, it forces one to become conscious of just how limited the accessibility can be in an airport. It can make one surrender the anonymity of a passer-through by the appropriation of the space.

A National Park.
Gerda Steiner and Jörg Lenzlinger. 2013. Exposition in Bündner Kunstmuseum Chur.

ALLUSION

PART III

HUB TYPOLOGIES

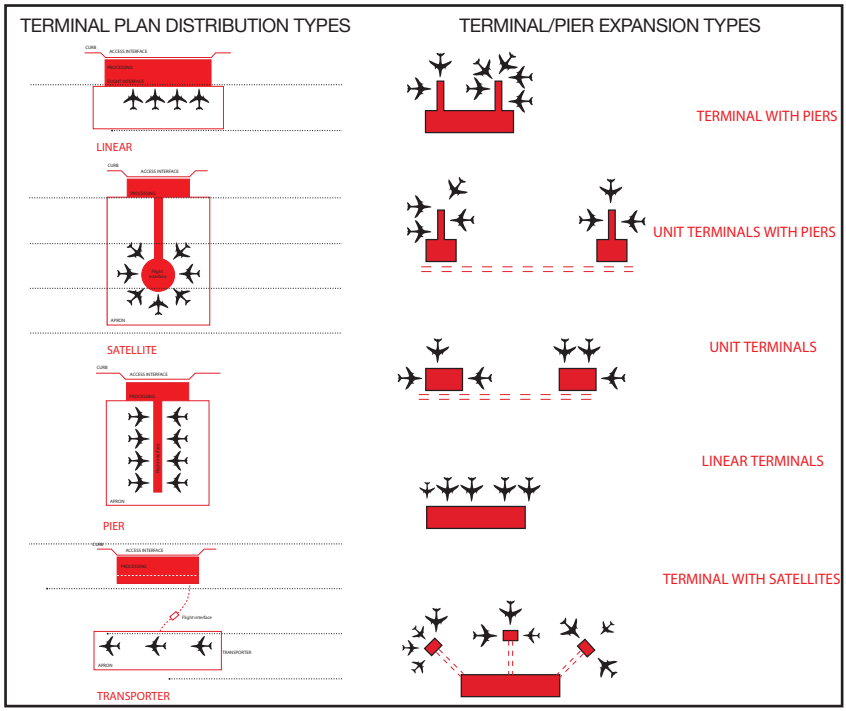
Competitive forms

“The core element of the airport product is in its infrastructure: runways, taxiways, terminals and so on. This infrastructure impacts on the airport’s competitive position, … . This infrastructure upgrade is an important part of strategy to further develop these regions ..”

Airport Competition [80]

The airport typologies can be imagined to be limited because they have a highly regulated function. However, as airports became a competitive business, it is interesting to see the organisation of the largest international hubs, who handle an incredible amount of traffic every day.
CAZA, a design studio based in New York, have done a research on airport typologies, where there have observed four main types of terminal distribution and 5 types of terminal expansion (As you can see below). This confirms the limitedness of airport typologies. However, the question is of their universality, whether certain of these typologies are used more for larger passenger traffic or not.
Airports became subject to competition after the 1980s, after the deregulation of the aviation industry took place. They transformed from monopolies to private institutions that competed for airlines. To do so, they needed to assure a strategic development that provides the infrastructure of quality and allows for an its expansion [Tretheway, Kincaid, 2010[81]]. Therefore the question is how the expansion of the leading airports was done.

Airport Design Research | CAZA - Carlos Arnaiz Architects [82]



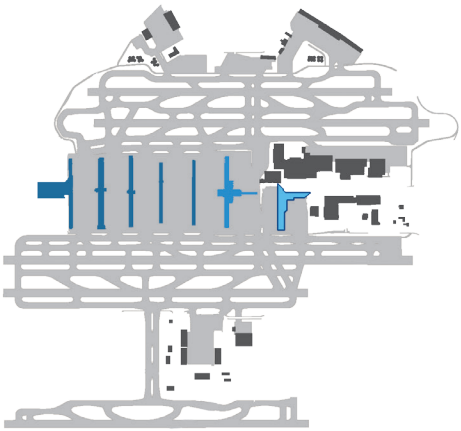
BUSIEST INTERNATIONAL AIRPORTS

The illustrations are mass plans of the ten busiest airports rated by passenger traffic (Total passengers enplaned and deplaned, passengers in transit counted once) [Airports Council International, 2014[83]]. The passenger terminals are highlighted in blue to see how they are situated to allow the smooth management of more than 30 million passengers last year. The gradient of blue varies with the time period a terminal has been built.

Legend:
Terminal construction periods:

- *1990 - today*
- *1970 - 1989*
- *1950 - 1969*
- *International Terminal*
- *Other buildings*
- *Runways and other routes*

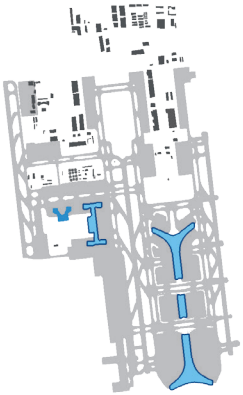
1_ HARTSFIELD–JACKSON ATLANTA INTERNATIONAL AIRPORT [84]
__ *Atlanta, Georgia, United States of America*
__ *72 199 400 passengers (1.5% change)*



200

The linear distribution. The expansion by unit linear terminals.
The linearity is conserved throughout the years.

2_ BEIJING CAPITAL INTERNATIONAL AIRPORT [85]
__ *Chaoyang, Beijing, People's Republic of China*
__ *64 004 178 passengers (1.4% change)*



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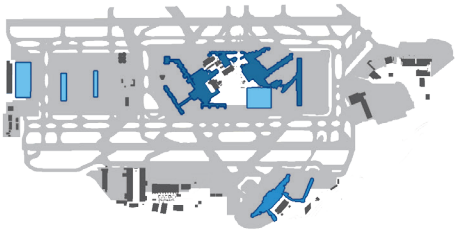
The linear distribution with integrated piers. The expansion by unit terminals. The terminals are parallel to each other and the piers distribution is persistent.

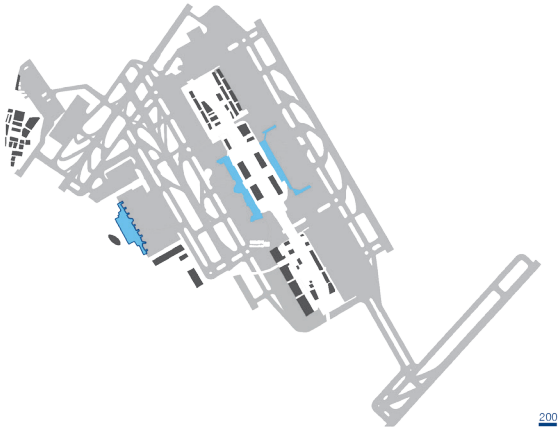
3_ LONDON HEATHROW AIRPORT [86]
__ *Hillingdon, London, United Kingdom*
__ *55 687 927 passengers (1.5% change)*



500

The original distribution by piers and unit terminals. The expansion is variable. The new constructions are separated by a distance to the historical core.

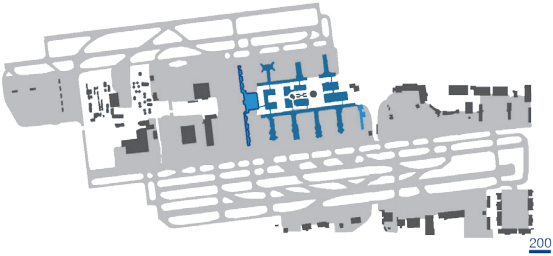
4_ TOKYO HANEDA AIRPORT [87]
__ *Ōta, Tokyo, Japan*
__ *53 809 428 passengers (5.6% change)*



200

The linear distribution with satellites. The expansion by same-type terminals. The old terminals are torn down to make place for new ones.

5_ LOS ANGELES INTERNATIONAL AIRPORT [88]
__ *Los Angeles, California, United States f America*
__ *53 498 032 passengers (6.3% change)*



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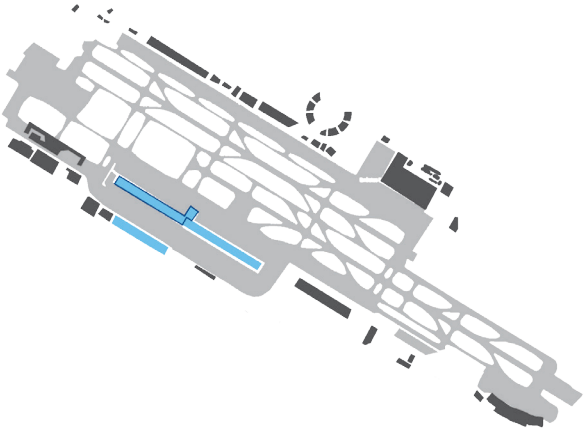
The pier distribution. The expansion by terminals with piers. The terminals are following each other in two lanes. One blocks the logic.

6_ O'HARE INTERNATIONAL AIRPORT [89]
__ *Chicago, Illinois, United Stes of America*
__ *52 434 527 passengers (4.2% change)*

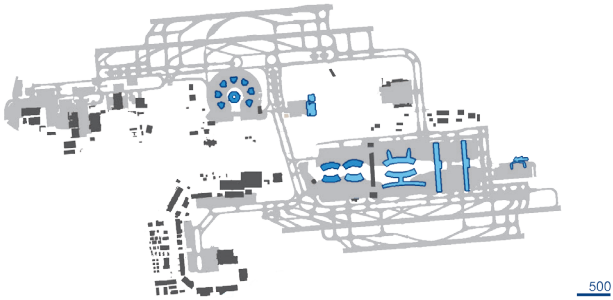
The satellite distribution. The expansion by piers, linear terminals.
The historical core has a round disposition that was abandoned later.

7_ DUBAI INTERNATIONAL AIRPORT [90]
__ *Garhoud, Dubai, United Arab Emirates*
__ *52 422 547 passengers (6.2% change)*



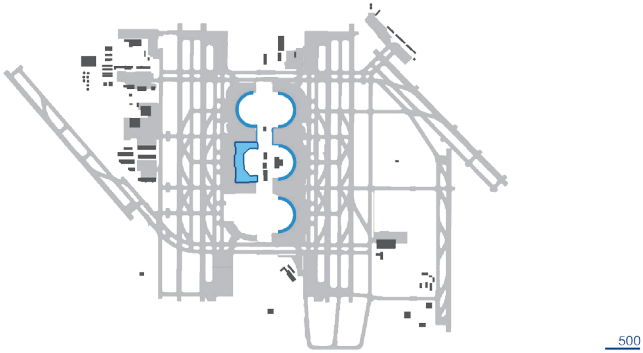
The linear distribution. The expansion with linear terminals.
The disposition of terminals is linear.

8_ CHARLES DE GAULLE AIRPORT [91]
__ *Roissy-en-France, Île-de-France, France*
__ *48 482 940 passengers (2.5% change)*



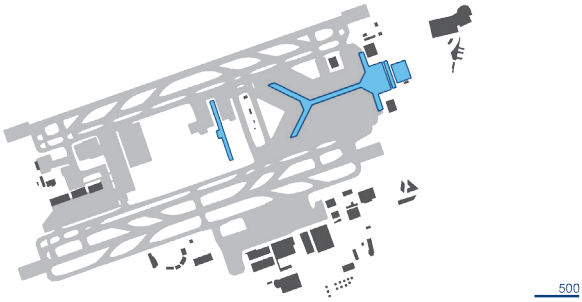
The original distribution is linear. All types of expansion are present.
The development follows the axe distinct from the historical core.

9_ DALLAS-FORT WORTH INTERNATIONAL AIRPORT [92]
__ *Dallas-Fort Worth, Texas, United States of America*
__ *48 209 028 passengers (5.5% change)*



The distribution is linear. The expansion by unit linear terminals.
The development follows a clear axe. Disposition is symmetric around the axe.

10_ HONG KONG INTERNATIONAL AIRPORT [93]
__ *Chek Lap Kok, Hong Kong, People's Republic of China*
__ *47 018 000 passengers (5.6% change)*



The distribution is through piers and a linear satellite.
The planned expansion is a unit terminal with piers, parallel to the existing one.[94]

The dominant distribution type is linear, where a terminal is expanded by piers or satellites. It can be assumed that a transporter type is temporary solution during a construction of a new terminal. The extension is principally done by units of terminals, which are sometimes separated from each other, and other times are connected through passageways. It can be observed that the construction of the new terminals follows a linear axis, which is parallel or perpendicular to the runways. The development in a node - O'Hare, Charle-de-Gaulle and Heathrow - is no longer sustained. It can be assumed that the linear evolution is more efficient. Generally terminals with piers or satellites are parallel to the runway whilst linear terminals are perpendicular to runways. Apart from Dubai, the terminal are situated in-between the runways, being in the center of the plan.

It can be also noted that the two european airports - Heathrow and Charles-de-Gaulle -, as well as Hong Kong, have international flights from all of their terminals, whilst the others host international flights in specific terminals. These specific buildings are generally "thicker" so as to accommodate a longer sequences of controls (customs and immigration).

LEARNING FROM ... DUBAI

The port geography

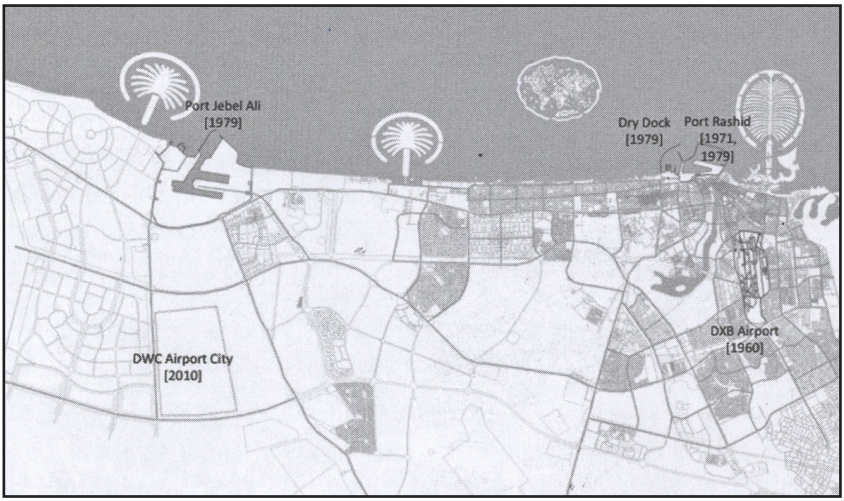
"... for Dubai's exceptional port facilities and the subsequent foundation of the Free Zone at Jebel Ali have contributed more, perhaps, than any other innovation to the present which Dubai enjoys"

Dubai Amplified, Stephen J. Ramos [95]

Dubai is interesting for its location and its infrastructural development. It is located, like the Siberian Region, halfway between European and Asian continents. It also has a severe climate, though that of heat rather than cold, as it is situated in a desert. Dubai also has considerable resources of oil, found at the beginning of twentieth century. However, it's strategic development of international infrastructures has shaped the city, leading to a rapid growth of Dubai region in the past 50 years [Ramos, 2010[96]].

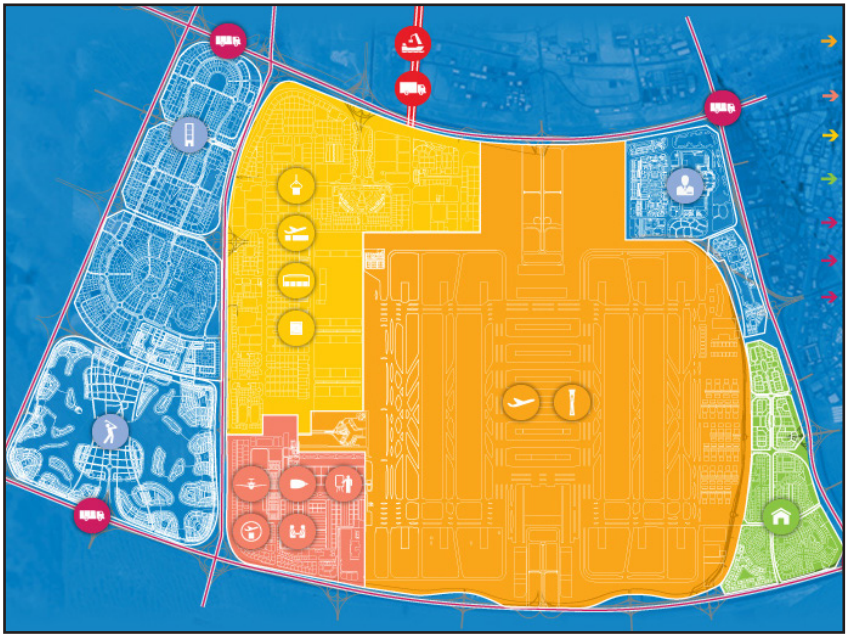
Dubai – from desert to city

Dubai is one of the 7 emirates that formed in 1971 the United Arab Emirates. Before that Dubai was a territory of interest for Britain, who took it under its protection though leaving it its sovereignty. United Kingdom was interested in the peace of this region because it had trade routes to its eastern colonies. However, once the oil was discovered, Britain declared the port town of Aden, the crown colony and used it to refine and transport oil. Aden also served Britain rule as an important military base as it was strategically placed between the red Sea and Indian Ocean. In 1960s economical and political events lead the United Kingdom to renounce to all of their interests in the region of Suez Canal by 1971.
The British interest in the territory of Dubai as an intermediate maritime port has had a positive impact because it built the trading system. The merchants' character of the city, especially the "free zone" has attracted immigration, that formed the internationality of the region, that is important in today's economy. It has arrived in two waves, first being due the taxation of the Persian Lingrah port, and second to to the oil extraction industries.



Ports and airports map with inagural dates | Dubai Amplified, Ramos, 2010 [97]

Dubai World Central Master Plan | Dubai World Central 2014 [98]



However, to ensure Dubai importance as a center for international trade and "entrepôt", as well as strategically invest the oil revenus, the ruling king of the emirate has centered the development of the region on large-scale infrastructure. However, Dubai, though initially developed thanks to its port geography, couldn't rely only on water transportations for its growth because of the competition with another water part of Sharajah. Whilst Dubai has diversified and has developed the industrial sector along with maritime ports, the construction of an airport has been important to keep and to develop the business and trade.
Along with the development of the air transportation, application of the free zone policies in 1980s has allowed to boost its economy. Also, the geopolitical situation in 80's, that of Iran-Iraq war, has given an opportunity for the city to acquire the international cargo trade. This economical development, in turn, has solicited the construction of a larger aeroportal infrastructure to deal with the increase of the air traffic. The extension of the Dubai international Airport is an articulation point of business strengthening and spatial expansion of Dubai. However, another airport is planned to stimulate further territorial, trade and tourism growth. The DWC AIrport City (Al Maktoum International Airport) is envisaged to be "twice the size of Hong Kong Airport". The project of a cost US$ 33 billion was postponed for a while for its out-of-scale ambition. However, today, first phase has been completed [Dubai World Central, 2014[99]].

Therefore we can see the similarities between Dubai and Siberia, that were both developed in two waves, that of the access to the eastern territories and industrialisation. This signifies the possibility of implication of infrastructural strategy from one territory to another.

The above description of Dubai is based on the Dubai Amplified written by Stephen J. Ramos, Harvard University, USA [100]

CLOSED CITIES

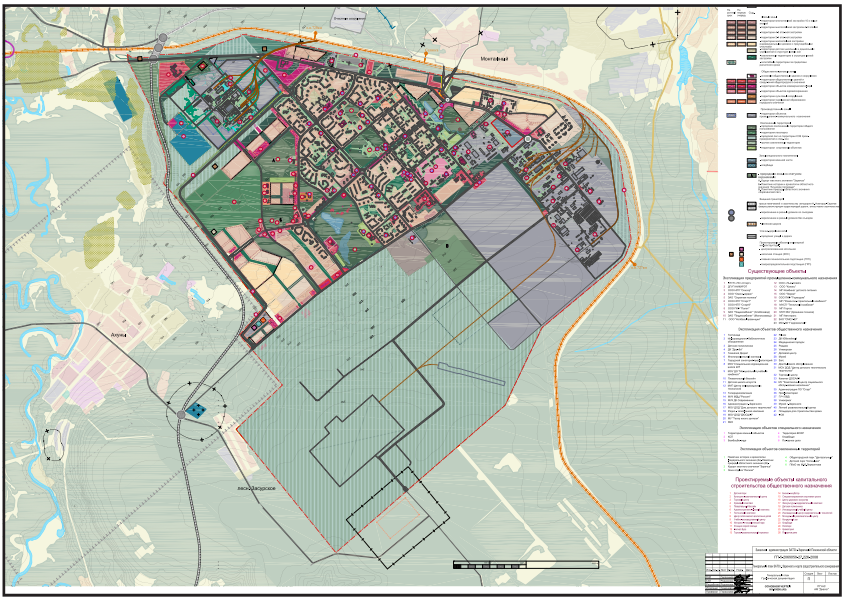
Airport as an autonomous city

“Secret Cities: under communism these cities were home to sensitive strategic facilities meaning most were wiped off the map, and movement was heavily restricted”

The Guardian [101]

An airport and a closed (secret) city. Though they appear to be similar, there is a clear distinction in the original purpose in both types - one being built to access, and the other to be isolated. However they have one point in common - that of control. After 1991 most of the closed cities started to open up and to look for access and contact with the rest of the world. After 1980 most of the airports started to accommodate more than aeronautical companies, such as commerces, to profit from the passengers and to encourage them to stay longer. It is interesting to draw parallels between the two, as one transforms into another. An airport tightens their control becoming isolated from the context, while a closed city opens up becoming more integrated. The goal of both is to increase number of people visiting and their duration of stay.

Secret cities, as they were called in Europe, were established as places for science, knowledge and culture. In Russian they are known as closed administrative-territorial formations (zakrytye administrotivno-territorial'nye obrazovaniya), ZATO, or simply closed cities. They were created at the beginning of the Cold War, to host institutions of national importance that deal with the improving the security of the country. Generally they were formed for two types of facilities, nuclear and military. The secret cities didn't have names, but were coded by a name of a nearest city with a number, i.e. Moscow-2 or Chelyabinsk-70 (today Snezhinsk). According to the Russian law concerning closed cities, accepted in 1992, there were 47 cities with around 1.5 million inhabitants.



General masterplan of ZATO Zarechny showing the auto-suffisance of the city [102]

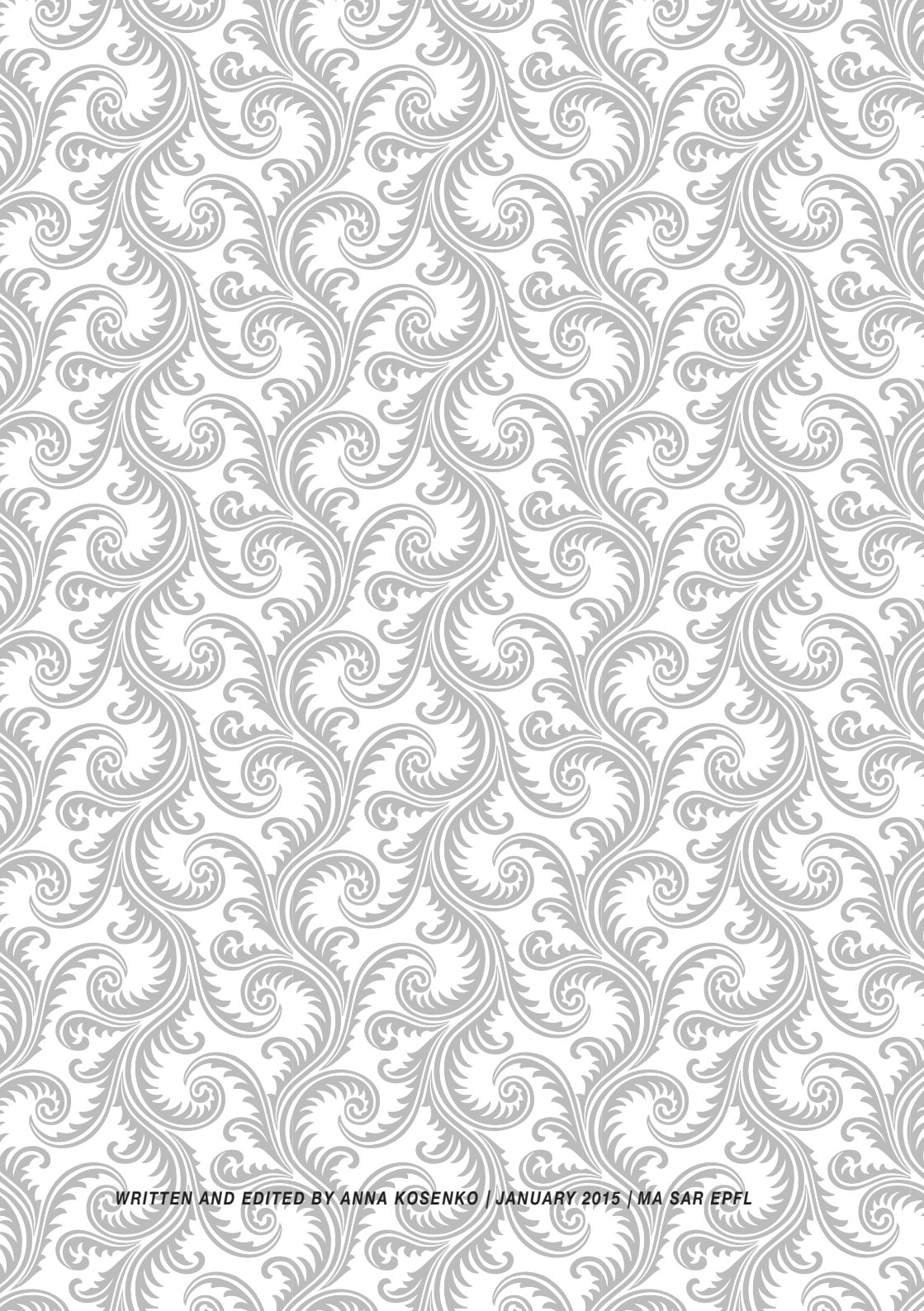
Old photograph of ZATO Zarechny illustrating proximity to nature [103]

The closed cities were surrounded by walls, fences, prohibited areas. The access was possible only through the points of control, and was strictly restricted. Their airspaces were closed, and unidentified objects that entered, especially of foreign origin, were shot down. They were completely isolated.

Their individual population was around 30'000 people. It is said that the IQ of a secret city was notably higher than that of a normal one, as it was a concentration of the intelligent population. The strict regulations and special conditions were implemented to stimulate creativity.

The change of the government in 1991 has had a huge impact on the closed cities. They had to adapt to the market to survive as they were no longer sponsored extensively by the government, thus starting to produce to sell. Some of them have also opened up, tearing the walls down. In certain cities most of the population was against it, as it meant letting other types of population in, increasing the crime rate and reducing the standard of living. The closed cities are an expression of a strong social segregation, where only the people who are smart enough are allowed, the "intelligentsia" elite. The degree of the education of the population has also posed an important problem as, once opened up to the world's economy, their unemployment has drastically increased - people were too qualified[104].

As we can see, a closed city and an airport have more in common then a control point. The changes in the reglementation brought significant changes to the both typologies, which had to start to compete in the global economy. To do so, they both saw a readaptation of their main purpose, offering a more diverse product to stay competitive. However, in Secret City typology the question of the type of people that these changes bring inside the citadelle is posed more sharply as they no longer have control over the flow.



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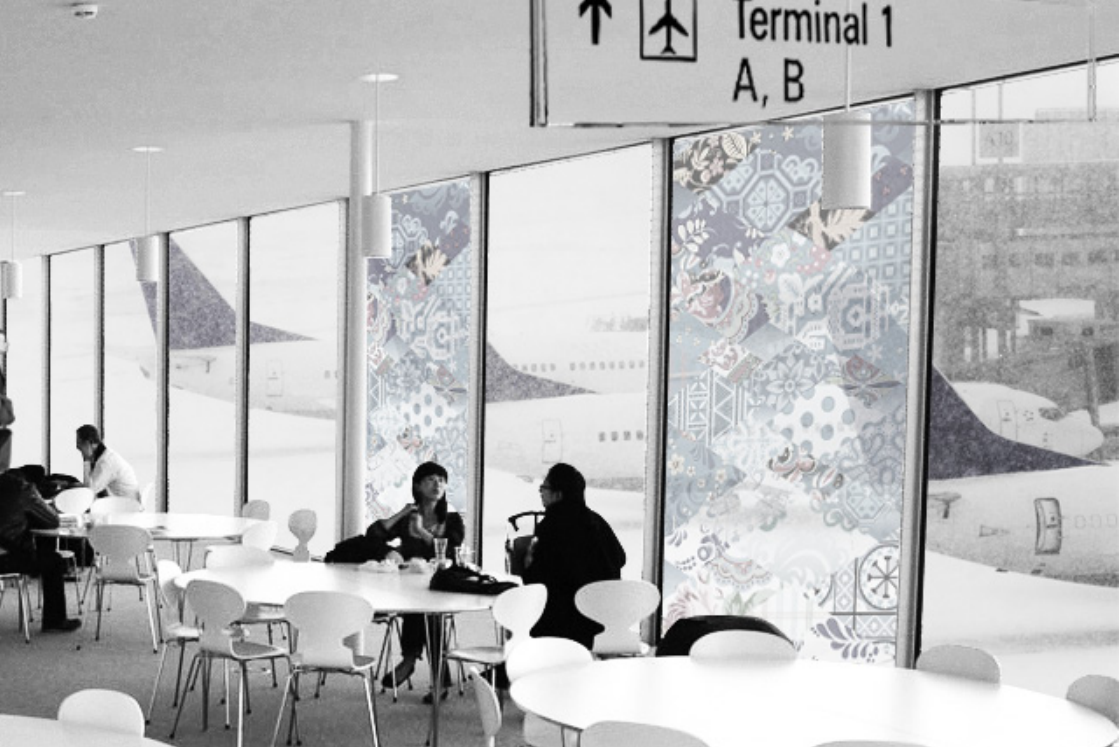
...PRELUDE

« … He was standing by the edge of a small pool – not more than ten feet from side to side – in a wood. The trees grew close together and were so leafy that he could get no glimpse of the sky. All the light was green light that that came through the leaves, but there must have been a very strong sun overhead, for this green daylight was bright and warm. It was the quietest wood you could possibly imagine. There were no birds, no insects, no animals, and no wind. You could almost feel the trees growing. The pool he had just got out of was not the only pool. There were dozens of others – a pool every few yards as far as his eyes could reach. You could almost feel the trees drinking the water up with their roots. This wood was very much alive. When he tried to describe it afterwards Digory always said, "it was a rich place: as rich as plumcake"»

The Chronicles of Narnia [105]

experiencing the AirPortal

... I closed the book and looked around. Airport was alike the in-between world described by C.S. Lewis. It had countless gates into other worlds - cities, regions, countries. From time to time the gates supplied the airport with new travellers, exchanging them with the ones that were already there. It was indeed quiet this early snowy morning. However, the space was alive. It was alive with nature, people, events, stories. The terminal opened up to the locality it was built in, bearing a russian signature in its essence. The view of the trees outside, that were within a hand's reach, talked about the richness of the local nature. The ornamentation on the windows evoked the local culture. These and other local signatures were very subtle in this international terminal. The building was a clear expression of the global culture. The space was flowing like the communication through the Internet. It felt infinite. The barriers were points of communication, on which you could read your gate or find out the nearest café.



A couple of friends strolled across the terminal slowly towards the puff zone. They looked tired, but strangely didn't go to the hotel in the west side of the Terminal. Once the flight from Beijing landed, I realised why was that - they were waiting for their families before going to the hotel. It was interesting to see how travellers no longer left hurriedly without a trace. Even those who seemed to be on business transfer, wanted to spend a few hours here to catch up with their acquaintances or just to shop or to rest.

The continuity of the space also no longer forced you to be moving all the time. The difference in its morphology allowed to subtly subdivide it into smaller zones, that finally felt human scale in this enormous infrastructure. The terminal became alike city center, with its own landmarks, diverse squares, lanes…

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APPENDIX 1 - SECURITY

These data shows the process from two different points of view. First type of data, a simplified table of security access, details the elements out of which it is composed. Second type of data, advice for screening procedure, explains the different aspects of security access, and which type of behavior triggers a more profound search.

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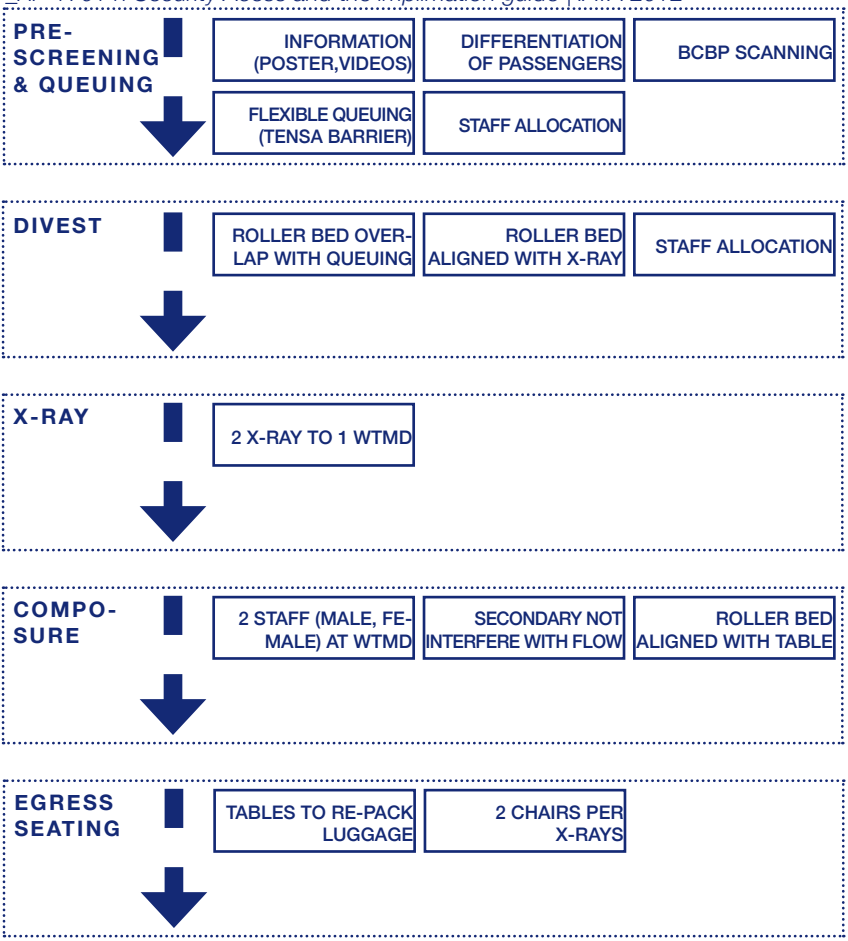

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Pre-Arrival Screening

_Although selection for secondary screening frequently occurs while travelers are at the airport answering questions from immigration officers, authorities may also preselect passengers because of some flags in their visa applications or airline records. Many countries issue visas upon arrival, however, nearly 50 countries require US tourist- passport holders to submit visa applications before travel. For holders of US diplomatic or official passports, the number of countries requiring visas before arrival rises to over 120. Security and intelligence services participating in vetting visa applications, either comprehensively or on an ad hoc basis, include those of Georgia, Libya, Pakistan, Russia, Syria, and Uzbekistan. (S//OC/NF) .....

Airport Primary Screening

_In primary inspections, immigration inspectors examine passports and visas, if visas are required, for validity and authenticity and to verify individuals' identities. They frequently query watch lists or other databases for immigration violations, criminal records, or national security concerns and ask basic questions pertinent to admissibility. The entire process usually lasts no more than a few minutes to enable airports to keep up with the flow of incoming travelers. If there is a watch- list match or inspectors decide that travel documents are suspect or have some reason to doubt a passenger's stated reason for travel, they refer the passenger to secondary screening. Officials at US airports on average send about one in 30 foreign tourists and business travelers to secondary although particular airports may impose higher percentages for certain groups. For example, US Customs and Border Protection (CBP) agents in 2007 imposed secondary screening on 20 percent of Cubans arriving at Miami International Airport. Available reporting does not indicate secondary selection percentages for foreign airports. (U) .....

Triggers for Secondary Screening

_Referral to secondary screening can occur for concrete reasons, such as a watch-list match or discovery of contraband, because of random selection, or because the inspector suspects that something about the traveler is not right. According to the CBP, inconsistencies or conflicts identified in the interview or documentation, including catching the person in a false statement, unreasonable explanation for travel, or anomalies in ticketing or reservations will prompt a referral to secondary screening. Travelers from specific countries arriving at international airports are more likely to receive heightened scrutiny, and referral to secondary screening, than other travelers. Behavior, dress, and demeanor also factor into an inspector's decision. However, no traveler is immune from the possibility of secondary— many foreign airports have an administrative requirement for a minimum number of random selections. (U) ...

Dealing with Secondary

_Consistent, well-rehearsed, and plausible cover is important for avoiding secondary selection and critical for surviving it. A frequent operational CIA traveler to Asia
and Europe advises that the most effective prevention of secondary is to have simple and plausible answers to the two most frequently asked questions, "Why are you here," and "Where are you staying." Travelers should also ensure before traveling that everything that officials can use to examine their bona fides—passports, travel history, baggage, personal electronics, pocket litter, hotel reservations, Web presence—is consistent with their covers. (S//OC/NF)
Mental preparation almost certainly helps travelers pass secondary scrutiny. Although a certain degree of nervousness is expected, persistent indications of deceptive behavior will almost certainly extend the secondary interview. According to a financial forensics expert in the commercial sector, deceptive persons:
• Allow a significant pause between a question and the response, or use delaying sounds, like "ah" or "um.» .....

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