Aeromobility and Social Consequences:
The Case of Mexico City International Airport

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Abstract
International air travel has increased dramatically in the past two decades. Often, increasing flying is seen as providing a range of new opportunities for people to be aeromobile on a global scale in relation to business, tourism, culture, family and politics. But through a case study of Mexico City International Airport, this article shows that this understanding needs to be qualified. By exploring a series of social and environmental consequences associated with a highly controversial airport, the article illustrates that increasing global air travel not only creates new opportunities for cosmopolitans to travel the world, but also results in a number of negative outcomes for the people living in the surroundings of the site. The everyday life in such areas is dominated by a number of serious problems in relation to health, noise, urban qualities, land use, fear and risk. In conclusion, the article therefore argues that the unexplored social consequences of aeromobility need to be examined more thoroughly in future planning, policy and aeromobility research.

Key words: Global air travel, airports, social consequences, noise impact, Mexico City, Mexico City International Airport, aeromobility research.
Introduction

“[...] Indeed, all major transportation systems, like those based on the boat, the horse, the railroad, and the automobile, have had profound effects upon society. How the new transportation based on aircraft is changing civilization, as reported in this book, reveals processes which are probably quite general”

William Fielding Ogburns
(The Social Effects of Aviation, 1946)

Mexico is the country of inequality. Nowhere does there exist such a fearful difference in the distribution of fortune, civilization, cultivation of the soil and population [...] Alexander von Humboldt
(Political Essay on the Kingdom of New Spain, 1811)

Global air travel has increased dramatically during the last decades. There are four million air passengers travelling every day, 1.9 billion air journeys each year and at any time 360,000 passengers in flight only above the USA (Urry 2007). The growth of international air travel has a profound impact on the spatial organisation of an increasingly globalised society (Derudder et. al. 2009). Air travel, modern life and globalisation have become more and more intertwined in a time where flying is mainly seen as related to a range of new opportunities for people to be aeromobile at a global scale (Cwerner et al. 2009, Kesselring 2006, Lassen 2009, Nowicka 2006). With respect to increasing global air travel, airports are a fundamental component. International airports are developing into small-scale global cities where airports’ developments are strategically important within the global competition of places, cities, regions (Urry 2007, Kesselring 2009). However, beside serious global environmental impacts related to flying (see Sausen et. al. 2005; Forster et. al 2006; Stuber et. al. 2006, Lian 2007), there exist a number of unexplored local social and environmental consequences associated with airports. The impact of air transport on the ground is significant and includes land take for airports, terminals and runways; noise and air pollution from aircrafts; pollution from buildings; air pollution and noise from roads and road transport serving the airport (Whitelegg, 1997: 86). These very material elements have serious impacts on the everyday life of humans living in the areas surrounding the airports.

Until now, most research in the field of aeromobilities seems to have been carried out in developed countries, leaving aside critical cases that are located in newly industrialised settings. This article therefore focuses on the social consequences of Mexico City International Airport (MCIA). MCIA is situated just a few kilometres away from the historical centre of Mexico City. It is surrounded by arguably the most densely populated area in the whole country. Altogether, more than 5 million people inhabit these predominantly low-income areas, which are commonly overwhelmed by considerable social and environmental conflicts. MCIA has operated internationally since the 1950s, and is today holding the largest number of daily operations (both freight and passenger) in Latin America while also serving the greatest number of passengers. The airport’s only two runways, which are used to their practical maximum capacity, operated in 2008 over 1000 take-off and landings per day and served over 26 million passengers (Airports Council International, 2008; GACM 2008). Despite a major economic crisis affecting the country during the mid-1990s, the airport’s average annual growth rate in terms of passenger traffic exceeded 4% for the past 20 years (DGAC, 2009).

The analysis in the article follows in the footsteps of William Fielding Ogburns classical study: ‘The Social Effects of Aviation’ (1946) where he looked at the ways through which aviation would cause social change in a numbers of areas, from leisure and family life to
population, cities and international relations. A fundamental assumption of this article is therefore that the social consequences of air travel cannot exclusively be approached by looking at the quality of humans’ social life, but must also include the physical environment where people’s everyday life takes place, especially focusing on factors such as noise, urban quality, land use, local environment, health etc (Dunlap & Catton 1983). Through the case study of MCIA, the article shows that increasing global air travel does not only create new opportunities for cosmopolitans to travel the world, but also causes a number of negative social consequences for the people living in the nearby districts surrounding the airport. The everyday life in such areas is dominated by a number of serious problems in relation to health, noise, urban qualities, land use, fear and risk. In a number of ways MCIA pictures the local social problems attached to increasing global flying. Therefore, in the conclusion, the article argues that the unexplored social consequences of aeromobility need to be scrutinized more thoroughly in future planning, policy and aeromobility research.

**Theory and research methodology**

Before delving into the social impacts and consequences of increasing air travel in the region of MCIA, we will briefly introduce the theoretical and methodological setup behind the investigation. Conventional mainstream air transport research has traditionally been founded in a ‘predict and provide’ rationality (Whitelegg 1997; Lassen 2005). This understanding of air transport has a strong focus on the calculation and prediction of air transport growth to provide the needed infrastructure and to determine airplane supply and airport capacity. The focal point of this approach thereby relates to a positivistic research paradigm in the sense that airport operations, benchmarking and performance are given strict priority (Graham 1999, 2001; Humphreys and Francis, 2000a, 2000b). Moreover, the social motives as well as the social and environmental consequences of air travel have more or less been a ‘black box’ (Urry 2007). This way of understanding and researching air travel is generally speaking represented by journals such as The Journal of Air Transport Management and other sorts of management studies undertaken mainly by business schools (see Graham and Forsyth 2010; Rhoades 2008; Czerny 2008). Moreover as Creswell argues ‘airport books tend to be general in tone and overly glamorize the airport as a global node of and site of transnationalism’ (Adey 2008: overleaf). There seems to be a lack of studies that try to ‘unpack’ and understand the airport (Cresswell 2006) not only as an infrastructure location, a global flow machine designed for the cosmopolitan traveller, but also explore the airport in its social, physical, architectural, geographical and environmental contexts.

Opposite to the above approach, this article is theoretically founded in the new emerging interdisciplinary field of aeromobility research (Cwerner et. al. 2009, Lassen 2005, 2006; Kesselring 2006, 2009), which is a part of the ‘mobilities turn’ (Cresswell 2006; Kaufmann 2002; Adey 2010; Urry 2000, 2007). The new aeromobility research focuses particularly on how aeromobilities are produced, reproduced, preformed and regulated in relation to various spaces, networks, systems and environments, as a way of ‘opening’ the black box of flying. The theme of ‘aeromobility’ research, instead of being only regarded as a simple air transport theme, indicates a need for bridging multiple scales connecting the international air systems to particular local, urban transformation processes and their consequences (Jensen and Lassen, in press).
A number of airport studies have already been developed inside this new aeromobility approach. In relation to such airport research at least four different focus areas can be identified. The first type of studies focus on the airport in relation to what might be called a cultural history perspective of aviation and airports (see Gorden 2004; Pascoe 2001). The focus is on airports social importance and draw on a variety of elements such as social history, landscape, architecture, aesthetics, literature and film. The second approach to airports focuses specifically on how airport politics and technologies in various ways contribute to the way airports have been securitized (Salter 2008; Adey 2007). Especially, it focuses on the relations between power, space, bureaucracy, technologies and migration within the airport space. The third approach looks particularly at the architectural design of the airport as a basis to analyze and understand how airports are transformed into new urban forms dominated by logistic (Fuller and Harley 2004; Smith 2003). It involves cultural analysis and analysis of virtual materials in the specific airport studied. The various approaches have all in different ways contributed to the new aeromobility research’s attempt to explore the societal significance of aviation. However, this article highlights that in relation to such new approaches there is additionally a need, not only to look at the airport’s social and historical significance on a meta level or restrict the analyses to the airport city, but there is a need also to examine the social impact of the airport in the urban context where it is located. The study of the social consequences of the airport should not be limited to looking at the airport as terminals, runways, etc. or the airport city, but must include the surrounding areas because airports are always located somewhere in a material and social context, and it is therefore not possible to understand the airport separated form the existing social and physical structures. As Kesselring points out, airports are not only interfaces of global space that stabilize the Cosmopolitan mobility but just as highly territorial and bound to social, cultural, economic and political norms of their location (Kesserling 2009:48).

Therefore, the study of this article takes a starting point in the new aeromobility research, and it is designed as a qualitative phenomenological case study, with field observations as the central data collecting technique. Mexico City International Airport can be seen as an extreme case (Flyvbjerg 2001), not only due to the country’s few restrictions on flying but mainly because the airport is located in an area within a city and a nation wherein significant economic and social issues are commonplace. The reason for choosing such an extreme case is that it allows us to see and understand some of the local social problems related to flying more openly. These problems are, to a considerable extent, certainly visible around a number of airports globally, and this raises a number of critical questions in relation to the increasing air travel.

In terms of methods, several fieldtrips were carried out, each one consisting of a number of stopovers within specific districts in close proximity to the airport (see figure 3). Several photographs and a number of open and unstructured interviews were undertaken in the fieldtrips (see all fieldtrip pictures and maps at: http://people.plan.aau.dk/~dgalland/mexicocity). Interviewees included local residents as well as other lay people owning their businesses in these districts. Moreover, a series of structured interviews was carried out in the Cuchilla del Tesoro district (a densely populated area just a few hundred meters away from the airport’s takeoff runway axis) to determine how the airport’s operations (takeoffs, landings and aircraft taxiing) tend to interfere with residents’ daily life and wellbeing. Finally, archival documentation from daily circulating newspapers from the past 10 years was also collected. Since the areas around the airport are characterized by low personal security, large groups of low-income people, well-known social issues and few public records in the field, our field study has largely been driven by the
available opportunities for obtaining data. So to a high extent our case study has been driven by 'what is possible?' instead of 'what is optimal?'. This reflects the huge lack of studies that explore the social consequences of aeromobility, which raise a number of both moral and ethical questions so in this case limited knowledge is better than no knowledge at all.

In the following, the paper is divided into two sections. In the first section, we describe the context of MCIA as a whole by briefly alluding to its history and addressing the most notable social and environmental concerns afflicting its surrounding districts. In the second section, we address the outcomes of our study by interpreting our collected data and analysing the social consequences of living under the corridors in terms of health and environmental impacts, recent shifts in access infrastructure, traffic flows and emissions, and land use conflicts. Finally, the conclusion and discussion are made, especially relating the findings to the ongoing airport research.

The context and history of Mexico City International Airport

Like Cresswell (2006) points, the airport is not a pure non-place (Augés 1995) or spatialities outside history. In the following the MCIA will therefore be explored historical and contextual. As of 2010, Greater Mexico City stands arguably as the most populous urban agglomeration in the Americas with an estimated population of about 20 million inhabitants (CONAPO et al 2007; CONAPO, 2006; CONESPO 2008; Forstall et al 2009; Partida & Anzaldo, 2003).1 The metropolis is located in a high valley at 2240m and is surrounded by mountains along most of its entire perimeter. Greater Mexico City has an extension of 7854 km² and spreads over three federal entities: the Federal District or Mexico City (16 boroughs), the State of Mexico (59 municipalities) and the State of Hidalgo (1 municipality) (CONAPO et al, 2007). Since the 1950s, a number of socio-economic factors such as the city’s significant population boom, its increased vehicle proliferation and soaring industrial activity, coupled with its unfavourable geographical position, have exacerbated air quality and pollution in the metropolitan area, thereby exposing human health at greater risk (Molina and Molina, 2002; 2004). Several environmental programmes intended to improve air quality in Greater Mexico City and mitigate health impacts have thus been put in place since the late 1980s, which have to some degree contributed to lessen the environmental impacts of unplanned growth (SMA 2009; Davis 2008; Hibler 2003).2 Being sited close to the core of the city, MCIA and its ever-increasing rate of operations are undoubtedly a main contributor in such controversial scenario, not only in terms of health and environmental impacts but also as far as social implications are concerned.

MCIA is situated at the NE of the metropolis in the eastern edge of Venustiano Carranza borough and just a few kilometres away from the historical centre of Mexico City. The airport is surrounded by an urban agglomeration prone of considerable social and environmental conflicts,

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1 In this article, we regard the population of Greater Mexico City as being equal to that encompassed within the political-administrative boundaries of the official definition of the Metropolitan Zone of the Valley of Mexico (Zona Metropolitana del Valle de México). Another official definition is that of Metropolitan Area of Mexico City (Zona Metropolitana de la Ciudad de México), which ignores political-administrative boundaries and includes the population encompassed in the urbanised area until interrupted by rural land use (Forstall et al 2009; Partida and Anzaldo 2003).

2 In 1989, the environmental program ‘Hoy no circula’ (commonly known in English as ‘A day without a car’) was launched by Mexico City’s Environmental Secretariat. In addition, an exhaust-monitoring program (known in Spanish as ‘Verificación vehicular’) has also been in place, whereby a car’s pollutant emissions are analyzed every six months.
which arguably holds the highest population density in the whole country. This region consists of the municipality of Ciudad Nezahualcóyotl (1,086,720 inhabitants) and the boroughs of Gustavo A. Madero (1,168,120), Cuauhtémoc (531,004), Iztacalco (386,399) and Iztapalapa (1,856,515). Altogether, the number of inhabitants that live within the boundaries of this low-income and congested region (demarcated in figure 1 below) roughly equals that of the whole population of Denmark.3

(Insert Figure 1 about here)
Urban agglomeration around MCIA exceeding 5 million inhabitants

MCIA holds nowadays the largest number of operations in Latin America while also serving the greatest number of passengers in that whole region. The airport’s annual growth rate in terms of passenger traffic has almost steadily increased during the past 20 years, except for the years following the Mexican economic crisis in late 1994, and more recently due to the swine influenza outbreak in 2009. Beyond these events, the development of air travel in MCIA has been a story of constant growth as compared with the most important airports in the world.

(Insert Figure 2 about here)
Annual passenger traffic and operations at MCIA from 1990 until 2009.4

MCIA is sited in what was originally an airfield serving for military purposes and exempt from urban sprawl well beyond its perimeter.5 The airport was officially inaugurated for commercial use in 1952 and operated under a single terminal concept to handle both domestic and international flights for several decades. A steadily rising air-travel demand during the following decades created a necessity for the expansion of the airport’s limited infrastructure. By the mid-1990s, a new international terminal was built and constantly upgraded during subsequent years. This process required the thorough restructuring of a rather limited area surrounded by dense urban settlements. The beginning of the 2000s then witnessed a contentious debate about where to site a new airport, a process that disentangled serious land use conflicts and political turmoil. The process temporarily ended up with the decision of siting a new terminal (Terminal 2) that was inaugurated in 2008, which required the construction of important access infrastructure within the heavily urbanised areas surrounding it (see figure 5).

Growth pressure on MCIA can also be understood as an outcome of recent institutional and market changes. The Mexican government passed the Ley de Aviación Civil (Law of Civil Aviation) and the Ley de Aeropuertos (Airport Law) in 1995, which established new rules regarding the liberalisation and entry into the aviation sector. These laws were succeeded by important development shifts during the following decade, such as the privatisation of Mexico’s

3 Figures are based on 2009 national estimations from the National Council of Population (CONAPO, 2009), which have been projected according to the II National Counting of Population and Housing carried out by INEGI in 2005.
4 Data regarding both passenger traffic and operations in MCIA were obtained from three different official sources: a) the General Directorate of Civil Aeronautics (DGAC) annual reports entitled “La Aviación Mexicana en Cifras” (Mexican Aviation Statistics); b) the National Institute of Statistics, Geography and Informatics (INEGI) the “Anuario estadístico del Distrito Federal” (Statistical yearbook of the Federal District); and c) MCIA annual statistics. Some discrepancies exist from one source to another with regards to both passenger traffic and operations.
5 A detailed account of the history of Mexico City International Airport can be found at the airport’s official website: http://www.aicm.com.mx/acercadelaicm/GACM/index.php?Publicacion=5.
major airlines and the introduction of low-cost carriers by the mid-2000s, which considerably increased airline competition in the country. By 2008, these carriers had already captured over 30% of the airline market as measured by passengers (Ros, 2010). Additionally, increasing air travel by means of low-cost carriers in Mexico seems to be substituting traditional modes of transportation, such as the bus. This situation has consequently placed further traffic pressure and congestion in MCIA.

As related to several other megacities around the globe, all these changes regarding an ever-increasing demand for air travel and the need for significant new infrastructure call for investigations of what this means socially for the people living in such megacities. In the following sections, we will therefore delve into some of the social and environmental impacts of the airport’s massive increase in operations as well as the side effects of its required access infrastructure.

*Insert Figure 3 about here*

*Districts in close proximity to the airport wherein the empirical study was carried out.*

**Living under the corridors: Everyday life in the airport areas**

MCIA is a part of a large socio technological air system that so far mostly has been explored from inside. Elsewhere, Lassen (2009) has described such systems through the notion of ‘corridors’. Global high-speed air travel, he says, mainly takes place in airports, in aeroplanes, in trains and metros, on motorways, in cars and taxis, in hotels and business offices all organised around corridors. Such corridor movements deliver both logic of action and a material spatial origination of contemporary social practice. It is a spacious organisation, where the corridors function as a selection mechanism, which picks and chooses so that the traveller is distributed in concordance with the logic of the corridor – a logic which is anchored in ‘space of flows’ (Castells 1996). It is a particular design for the ‘fast-tracked kinetic elite’ (Urry, 2007:33) travelling the globe. However, the mechanisms of stratification do not only lie in the corridors themselves. There exist a number of material consequences for people excluded from the ‘smooth corridors’ (Urry 2006) of air travel, but forced to live under, or beside the infrastructure and mobility of the airport which is particular visible at MCIA.

Using Goffman’s (1971) work, we can distinguish between the *frontstage* and the *backstage* of the air corridors. The backstage of the airport is not only represented by many airport workers (Sheller and Urry 2006) and the invisible systems of mobility regulation, surveillance and control (Salter 2008), but also by the thousands of people living and working in urban areas surrounding the airport. Except for the district of *Jardín Balbuena*, every surrounding district of MCIA is characterised by a predominantly low-income population living in densely built, low-rise dwellings. Road infrastructure is to a considerable extent incomplete and defective within most of these districts, and an undersupply of basic services is also perceptible, particularly in the eastern neighbourhood areas. Moreover, crime and insecurity seem to be constant threats to

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6 Low-cost carriers such as VivaAerobus, Interjet and Volaris strongly compete against the two main airliners such as Mexicana and Aeroméxico since the mid-2000s.
residents.\textsuperscript{7} This stands in remarkable contrast with the frontstage of the airport with its ‘icons signifying toilets, banks, duty-free shops, departure gates, customs…’ based on ‘high-speed travel, efficiency, a hygienic and bureaucratised social environment that offers little resistance, and haute-gamme consumption’ (Eriksen and Døving 1992:5).

Regarding the backstage of MCIA, it is almost ironic to realise that several grandstands existed along the airport’s southwestern boundary, where hundreds of people living or working in the surrounding areas used to sit and watch airplane takeoffs and landings every day. Despite important traffic and health risks due to a close proximity to major transit roads and MCIA’s runway grounds, this ‘entertainment’ activity persisted during the 1980s and 1990s. Today, this phenomenon has somewhat ceased as higher walls and fences have been built to obstruct visibility, although spectators and bystanders still position themselves on pedestrian staircases and bridges to watch aircraft activity occurring within the airport’s premises (see fieldtrip pictures at: http://people.plan.aau.dk/~dgalland/mxicocity, Advertising rooftop billboards).

\textit{Health and environmental impacts}

Aircraft noise-induced hearing loss and other negative effects on human health have been explicitly addressed by scientists, particularly with respect to psychological and cognitive repercussions in school children (Hygge, et al 2002; Evans et al 1998; Evans et al 1995). Noise exposure due to aircraft constant take-offs and landings impacts heavily on citizens living and working in close proximity to the airport’s boundaries. In the case of MCIA, the district of \textit{Cuchilla del Tesoro}, located next to the airport’s northeast limits, has its closest dwellings at only 150-200m from the take-off runway axis, thereby being prone to constant aircraft noise exposure (see figure 4).

\textit{(Insert Figure 4 about here)}

\textit{The district of Cuchilla del Tesoro on the north edge of MCIA, being heavily and constantly impacted by airplane take-offs and landings as well as by large maintenance and operations facilities}

Our field study indicates that resident perceptions regarding the different types of distress product of living in close proximity to the airport vary in accordance with the districts’ location. A prevailing concern relates with the impact that aircraft noise may inflict on residents’ health. Air pollution and the constant construction and upgrade of road access infrastructure during the past years have been similarly worrisome to the well being of local residents. \textit{Cuchilla del Tesoro} is probably the most impacted district in terms of noise from constant take-offs and landings given its close proximity to the airport’s runways. A local newspaper \textit{Reforma} describes in the following the everyday life in this district:

\begin{quote}
“Street vendors, workers and other residents coincide in that the early morning hours are nearly unbearable. This occurs at 6 am sharp when pilots start the turbines and head up to the runway for
\end{quote}

\textsuperscript{7} In these regards, a GIS-based study shows that dozens of drug-trafficking and crime bands operate in MCIA’s surrounding districts (Metrópoli-2025, 2009). It is also common to find articles in daily newspapers that relate with crime scenes occurring in MCIA surrounding districts.
According to another interview in the local newspaper the noise impact seems also particular to children’s behaviour in the district:

“It is commonly perceived that children who attend summer school here see their behaviour altered; they seem more nervous and aggressive than the average.” (Author’s own translation)

- Reforma newspaper quoting an elementary school librarian in Cuchilla del Tesoro district (Venustiano Carranza borough, Mexico City)

However, some of the interviewees living in Cuchilla del Tesoro seem to have resigned themselves in regarding noise as an everyday issue. The following response alludes to such a case:

“It’s a matter of getting used to it. It is like the one who lives right next to the rail tracks and everyday they feel the vibration. The one who was born here has become used to it, because not even babies wake up with aircraft noise”. (Author’s own translation)

- Consignment store owner in Cuchilla del Tesoro district (Venustiano Carranza borough, Mexico City)

An official complaint submitted to the North American Commission of Environmental Cooperation (CEC) by a group of organised residents living in the district of Jardín Balbuena supports the more general concern regarding noise impact on human health (CEC, 2002). In the submission received by the CEC Secretariat in 2002, local residents asserted that the federal government failed to effectively enforce its environmental laws with respect to the noise emissions originating at MCIA. Amongst others, the submission specifically emphasized the transgression of an official standard for point source emissions (NOM-ECOL-081-1994) that establishes a maximum allowable limit at 65 decibels (INE, 1995). The residents’ assertion was founded on evidence indicating that aircraft noise emissions result in hearing loss, lessened academic performance of the children in the area and other negative side effects due to loss of sleep.

In responding to this public complaint, the government of Mexico clarified that the alluded noise standard was not transgressed as it only applied for fixed sources, and that an applicable standard (namely NOM-036-SCT3-2000) for mobile sources such as aircraft established higher maximum allowable limits. The response pointed out that the agreed percentage of the nation’s air fleet at that time had decreased noise emissions within the times provided in such norm, and thus that the government had effectively enforced its environmental laws. After analysing the submission and based upon the explanatory rationale behind the government’s

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8 The mandate of the North American Commission of Environmental Cooperation is to promote the effective enforcement of environmental law. The CEC comprises a Council, a Secretariat and a Joint Public Advisory Committee. After reviewing citizen submissions on enforcement matters, the Secretariat determines whether to recommend the preparation of a factual record, which may assist submitters and members of the public in taking subsequent actions.
response, the CEC determined not to recommend the preparation of a factual record, which meant that the case had been finally resolved in favour of the Mexican government.

The case clearly shows the existence of law gaps and mismatches between airport and aircraft noise regulation. First, a juridical stance regarding how different norms regulating airport and aircraft noise should supplement or discount one another seems to be lacking. Neither norm establishes a procedure concerned with how to deal with noise emissions originating from mobile sources that are intrinsically linked to point sources. Secondly, it shows that different government entities regulate noise emissions through seemingly incompatible official standards. Whereas point source noise emissions are determined by an environmental standard established by one ministry, non-point source emissions are regulated by a transportation standard determined by a different ministry. This situation suggests that there is a potential mismatch regarding the harmonisation and thus the adequacy of these norms when individually applied. In addition, government entities in charge of different policy domains but regulating a similar question could potentially give way to conflicting mandates in relation to a common concern. While this situation is rather evident, the issue stemming from it does not seem to be dealt with in practice in the case of MCIA. In the end, the case thus reveals that the gaps and mismatches that are present in this noise regulatory framework aggravate the negative consequences of aeromobility on the backstage population, which inevitably has to bear with most of the burden resulting from an incomplete and fragile legislation.

The noise management approach used by the government and the airport in the MCIA case seems very similar to what Faburel and Levy (2009) term as the ‘technological legitimation’ noise model. This model, supported by stakeholders in the air travel industry and central authorities, attempts to rationalize the debate by legitimizing certain arguments and modes of action and delegitimizing others. As Faburel and Levy stress: ‘with a strong emphasis on the physical sciences and technology, this model naturally encourages actions based on acoustics overlooking cultures, codes and regulations... supported by the technological legitimation, traditional airport expertise has disqualified local stakeholders by delegitimizing the study of local impacts of aviation noise, making it harder for these to become subjects of both observations and debate (Faburel & Levy 2009:215-216). The MCIA case supports Faburel and Levy findings:

“the impact of aircraft noise on airport surroundings remains largely under-investigated, while local identities find it hard to establish themselves as legitimate issues. This lag derives in part from methods of pricing the local costs of aircraft noise. Myths about the structuring effects of mobility and transportation separate what should be kept together (namely, airports and their host communities and perpetuate the strictly functional representation of airports infrastructure, equipment and surroundings, consolidated in notions as hub, gateway and hinterland. This particular coding, which links systems of knowledge and value, has constituted to a collective blindness to potentially complex and multiple effects of noise on local people” (Faburel and Levy 2009: 218).

Until now, it has not been possible for the local people living in the surrounding urban areas of the airport to put the local noise experiences on the agenda at all, despite the fact that recent evidence regarding aircraft noise emissions in the district of Cuchilla del Tesoro indicates that measurements of up to 120 dB are common at the boundary dividing this dense urban settlement from the airport (Rojo-Ruíz, 2008:72). Beyond noise impact deriving from aircraft take-offs,

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9 It has not been possible to find any recent official evidence regarding noise emissions in nearby districts. Our study thereby only relies on academic sources and resident complaints. As the topic of the airport in general is a very
landings and displacements towards Terminal 1, point source noise pollution from the busy and steady operations at the neighbouring Mexicana de Aviación maintenance facilities also seem to constantly distress everyday life and probably also transgress the abovementioned point-source norm NOM-081-ECOL-1994 in the district of Cuchilla del Tesoro. An interviewee living in the district comments:

“(...) at times during the night it gets too noisy due to living close to the (one of the airport’s) maintenance area(s). It has become part of our everyday life, so we have no other means than getting used to it and fall asleep”. (Authors’ own translation)

- Resident in Cuchilla del Tesoro district
  (Venustiano Carranza borough, Mexico City)

Health and environmental impacts from aeromobility also derive from high traffic flows and the emission of pollutants to the atmosphere. Evidence collected by Mexico City’s Environmental Secretariat indicates that pollutant emissions in the centre and northeast areas of Mexico City are significantly high as compared with the rest of the metropolitan area (SMA, 2009). In their latest annual report, the Secretariat attributed more than 80% of pollutant emissions to car traffic flows (SMA, 2009:56). Monitoring stations indicate that the distribution of contaminants in the airport’s surrounding districts is among the highest. Moreover, according to a recent study carried out by the National Autonomous University of Mexico (UNAM), several scenarios (wherein estimated emissions of pollutants such as nitrogen oxides, hydrocarbons and carbon monoxide) indicate that car traffic flow emissions during rush hours within the airport’s neighbouring districts during rush hour are likewise amongst the highest as compared with other city boroughs (Lozano et al, 2008). The high concentration of pollutant emissions in the vicinity of the airport suggests that there may also be a direct correlation between air traffic emissions and high degree of pollution in those areas.

**New airport access infrastructure**

The construction of new access roads in close proximity to MCIA has inevitably generated a scenario comprised by winners and losers. The construction of Terminal 2 in recent years required the development of 11.5 kilometres of new access roads, including the erection of 2 elevated roads (distribuidores viales) built on top of existing road infrastructure to facilitate car traffic flow coming from major city roads towards the terminals (see fieldtrip pictures at: [http://people.plan.aau.dk/~dgalland/mexicocity](http://people.plan.aau.dk/~dgalland/mexicocity), New airport infrastructure). Similar infrastructure was also built to connect both terminals along the airport’s southwest boundary, which also included the construction of a monorail line (aerotrán). The first elevated road connects an internal expressway (Circuit Interior) with Terminal 1, while the second one connects another internal expressway (Viaducto Miguel Alemán) with Terminal 2 (see figure 5). The latter is of special interest as its last section was built cutting through neighbouring districts, thereby creating a potential for long-term impacts with respect to their urban quality and liveability. The

contentious issue in Mexico, we believe that authorities handle data with extreme caution by virtue of potential conflicting interests.
The most recent issue (caused by airport’s proximity to the district) has been with the building of the new elevated road (in Economía Avenue to access Terminal 2), which provoked severe damage to the structure of some residents’ homes. From what I understand, neither the borough’s office nor the local government assumed any responsibility. Noise is not a big issue in this neighbourhood, although we can always hear the starting of aircraft engines at 5 am.” (Author’s own translation)

- Corner-store owner and resident, district of Colonia Federal (Venustiano Carranza borough, Mexico City)

“The building of new infrastructure in the proximity of the airport has affected us commercially.”

(Author’s own translation)

- Corner-store owner, district of Colonia Federal (Venustiano Carranza borough, Mexico City)

New elevated roads such as the distribuidor vial of Viaducto Miguel Alemán (built over Economía Avenue along the eastern edge of Colonia Federal) create a physical barrier between local districts, thereby shifting and restricting pedestrian and local traffic mobility patterns. This has implications in relation to a reduced quality of the urban space and in restricting the walkability pattern of local residents and workers in the area (see fieldtrip pictures at: http://people.plan.aau.dk/~dgalland/mexicocity, Colonia Federal). Such elevated roads have also caused that advertising billboards be placed on the rooftops of residential buildings, thereby creating a form of visual pollution that affects the aesthetics of these districts (see fieldtrip pictures at: http://people.plan.aau.dk/~dgalland/mexicocity, Advertising rooftop billboards).

Beyond the nuisance generated to local residents during long construction periods, siting this type of infrastructure in the middle of mixed land-use urban areas potentially generates property depreciation and damage to local businesses, leaving residents with no other choice than carrying with externality costs as well as any other long-term economic and social consequences associated with living at the backstage of the airport. In light of this scenario, the case of new infrastructure built exclusively to serve the airport is an example of a transportation network designed to favour the mobility of the elite and tourism at the expense of local resident liveability. The dividing effect caused by this type of overlapping infrastructure in deprived urban enclaves (such as Colonia Federal) can also be seen as a case of “socially segregated mobility patterns” (Jensen 2007), where the mobile elite increases its potential for movement (or motility, as defined by Kaufmann 2002) by benefiting from a ‘safe and sound’ route towards the airport, albeit in detriment of local motility and the quality of urban space.
Siting a new airport for Mexico City and land-use conflicts

The generation of land use conflicts due to the siting of new airports can be regarded as another negative social consequence of increasing aeromobility. Since the 1970s, the rationality behind the construction of new airports has been in line with the argument about our societal ‘need’ for satisfying an increasingly mobile lifestyle. Political discourses throughout different countries have ever since portrayed the subject of constructing new airports as a necessity to deal with the steady rise in air traffic that older airports cannot cope with. In making choices for potential airport sites, however, tensions across social and political lines can easily arise. Indeed, the planning process of these megaprojects often leads to controversial outcomes, most notoriously in the case of major cities where land is scarce and potential users abound. In such cases, governments tend to expropriate land of heritage value or properties that would otherwise be used for agricultural or recreational purposes. The case of land expropriation often leads to land-use conflicts, which commonly rise as a result of differing interests between different parties over the potential use of land. NIMBY reactions are usual examples of related land-use conflicts, which emerge as a result of public opposition given concerns about long-term social, economic and environmental consequences (Dear 1992). Along with decisions about siting nuclear power plants (Kraft 2000; Kaspersion et al 1992) or hazardous waste sites (Kunreuther et al 1993; Rabe 1994), the question of siting new airports is similarly characterised by reactions of the like. With more reason, even harder resistance can be expected whenever a siting process contemplates the expropriation of land.

The case of siting a new ‘global’ airport for Mexico City illustrates the above. Based on the argument that Mexico City’s two-runway airport had long exceeded its capacity, public officials announced in October 2001 the construction of a six-runway airport on the communal lands (ejidos) of Texcoco,11 a few kilometres east of MCIA. The reasoning behind the government’s decision to site a new airport in Texcoco responded to an increasing demand in air travel while minimizing costs and access times to users.12 The government’s logic was supported by a wave of discourses that advocated for modernisation and infrastructure development to meet the demands of globalisation in Mexico. Moreover, the project was meant to become the grand achievement of former President Fox’s six-year term, which had projected the airport as the ‘new gateway to Latin America’ and a hub for international and domestic flights.

While the new airport was planned to meet the federal government’s vision of having a global airport, the decision failed to acknowledge local and regional impacts, particularly in terms of who was to benefit and who was to pay the costs. To develop the site, the government

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11 Ejidos are collectively owned lands that were turned to rural communities as part of the land reform of the Mexican Revolution. These lands were inalienable and could be transferred only between family members (...). In 1992, reforms to the constitution made it legal for ejidatarios to sell or mortgage their land for credit, making the system more compatible with the export-led neoliberal economic model advocated by the country’s elites.”

12 The federal government disregarded other possible sites for airport construction, such as vacant land owned by the government in Mexico City itself, and communal land in the State of Hidalgo, namely Tizayuca, where farmers had actually expressed their willingness to sell their land for the project.
required the expropriation of 5400 hectares of ejidos belonging to communities living in the Texcoco area. The government also needed to relocate thousands of families who had lived and worked for generations within the designated area, particularly those living in the municipality of Atenco. However, from the moment the government announced its intention to construct the airport, communal farmers of Atenco made clear their total refusal to abandon their land. Regardless of such civil resistance, the federation gave green light to the project and offered the farmers a modest compensation (approximately 0.70 USD/m²) for their land.

A strong social movement to resist to the government’s expropriation order was then set off, which began with the creation of The Peoples’ Front in Defense of the Land or FPDT (Frente del Pueblo en Defensa de La Tierra). To counteract the government’s decision, the FPDT filed several legal challenges to the expropriation order and held constant protest marches in Mexico City. A series of unfortunate events characterised by violent confrontations between FPDT activists and police forces followed, most notably on July 11, 2002, when the federal police attacked an FPDT activist march, injuring several farmers and capturing most of the group’s leaders (Salinas and Alvarado, 2002). Immediately afterwards, several thousands of inhabitants then blockaded the highway to Mexico City and captured state officials. After a fragile standoff situation that was followed by negotiation to exchange hostages, the federal government decided to cancel the Texcoco project (Cuellar and Venegas 2002).

**Insert Figure 6 about here**

*Clashes between police forces and local residents as a result of the Government’s expropriation decree of farmers’ lands to site a new airport in Texcoco (BBC, 2002).*

The case explicitly demonstrates that the siting of new airports is prone to render negative effects, particularly when decisions do not follow precautionary planning schemes. Regardless of whether or not a new airport for Mexico City was required at the time, public officials and planners failed to understand a siting scenario characterised by complex dynamics between socio-economic, biophysical, political and cultural contexts. Reflecting on the government’s rationality behind the decision to site the new airport in Texcoco, Stolle-McAllister (2005) argues:

“To Mexico’s leaders, therefore, it is logical that the state has the right and obligation to provide for the fulfilment of those needs and desires, even making decisions that may be painful to local residents who seem uninterested or unwilling to participate in the improvement of the nation’s future. They argue that, while unpleasant, some sacrifices must be made by a relatively small number of people (the several thousands who live and work on these lands) so that a great many more (the 100 million other Mexicans) will benefit from solidifying this essential link to global capital.” (Stolle-McAllister 2005:25)

The case showed that the government’s development goals of growth clearly outweighed local and regional concerns about tradeoffs and their consequences. It was the farmers’ view that the government was only serving the interests of private developers and businesses at the expense of their own rights, livelihood and heritage. Such perceptions were neither contemplated during the

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13 For a detailed account regarding the series of events that occurred in Atenco, which followed the government’s decision to site the new airport in Texcoco until the cancellation of the project, see La Jornada Virtual (2002 on-line articles) and Kennis (2003). The social movement of Atenco and its implications in relation to Mexico’s democratic transition is explained in detail by Stolle-McAllister (2005).
determination of siting choices nor throughout the 9-month land use conflict. Thus, the failure to make an adequate siting choice can also be attributed to the government’s lack of policy implementation in terms of redistribution. In this case, a cost-benefit analysis regarding the multiple impacts of siting alternatives would have been imperative, as suggested by Sobrino (2000) before the actual decision to site the airport in Texcoco was made:

“The decision to be made by the federal government concerning the new airport (site) can be conceived as a redistribution policy since it will render winners and losers. The determining factor associated with this type of policy is to establish expectations about redistribution and the social costs and benefits that will be generated. Hence, the assessment regarding the most appropriate site must be subjected to a cost-benefit analysis based upon two questions: a) the efficiency of the action in respect to the desired objectives; and b) the efficacy with regards to economic and social impacts.” (Sobrino, 2000; author’s translation)

- J. Sobrino (2000), Centre for Demography and Urban Development, Colegio de México

Beyond cost-benefit analyses and understanding trade-offs, research has also suggested that the process of siting controversial facilities could benefit from more precautionary policy mechanisms (Galland & McDaniels, 2008; Galland, 2004), including public processes of negotiation (Kunreuther et al 1993), decision analysis (Keeney 1980) and regional planning schemes (McDaniels et al 2005). None of these processes seem to have been contemplated in this case. Complex case scenarios such as Texcoco could have additionally required the design and implementation of international regulations or other innovative forms of intervention established ad hoc by planners and decision makers to balance objectives and prevent unfortunate outcomes. From a planning perspective, the challenge remains to move beyond considering the rise of aeromobilities from a national economic standpoint, to a rationale that equally ponder trade-offs in terms of social and environmental impacts. From a social justice perspective, it can be argued that mechanisms need be developed to ensure that certain groups do not bear all the costs in situations where increasing aeromobilities only seem to benefit a privileged minority.

Conclusion and Discussion

As shown in this article, increased global air traffic causes a number of negative social and environmental implications locally for the thousands of people living in the surrounding urban areas of Mexico City International Airport. Currently, MCIA holds the largest number of operations in Latin America while also serving the greatest number of passengers in the whole region. The airport is surrounded by an urban agglomeration prone of considerable social and environmental conflicts, which arguably holds the highest population density in the whole country. At the backstage of the airport, there exist a number of serious problems in relation to noise, degraded urban qualities, land use issues, fears and risks. It is extremely difficult to articulate local experiences with noise and health problems. The article shows the existence of law gaps and mismatches between airport and aircraft noise regulation. A juridical stance regarding how different norms regulating airport and aircraft noise should supplement or discount one another seems to be lacking. Current norms do not establish procedures concerned with how to deal with noise emissions originating from mobile sources that are intrinsically linked to point sources.
Another important element in the case of MCIA is the reduction of urban quality in the surrounding areas of the airport due to new infrastructure built exclusively to serve the airport. Such new infrastructure can be seen as an example of a transportation network designed to favour the mobility of the elite and tourism at the expense of local resident liveability. The dividing effect caused by this type of overlapping infrastructure in deprived urban enclaves can also be seen as a case of “socially segregated mobility patterns”, where the mobile elite increases its potential for movement by benefiting from a ‘safe and sound’ route towards the airport, albeit in detriment of local motility and the quality of urban space.

Finally, in the attempt to become connected to the international flows of business travellers and tourists (Derudder et al. 2009; Gössling & Peeters 2007) the analysis in this article illustrates how local knowledge and problems are neglected in order to promote the global flow integration. The government wanted to respond to an increasing demand in air travel while minimizing costs and access times to users, which was supported by a wave of discourses that advocated for modernisation and infrastructure development to meet the demands of globalisation in Mexico. While a new airport was planned to meet the federal government’s vision of having a global airport, the decision failed to acknowledge local and regional impacts, particularly in terms of who was to benefit and who was to pay the costs. The government’s plan was thereby constrained by expropriating the farmers’ ejidos and relocating thousands of families who had lived and worked for generations within the designated area. The farmers’ view was that the government only served the interests of private developers and businesses at the expense of their own rights, livelihood and heritage. Regardless of whether or not a new airport for Mexico City was required at the time, public officials and planners failed to understand a siting scenario characterised by complex dynamics between socio-economic, biophysical, political and cultural contexts. In summary, the airport, and its surroundings, is a space where movement, meaning and power meet (Cresswell 2006) and pictures that it is difficult to imagine increasing aeromobility without the presence of power.

In the light of the findings above, a number of points seem appropriate to highlight in relation to the existing and emerging aeromobility and airport research. International airports are described as ‘nodes in a global network of travel, trade, architecture, design, technological innovation, security’ (Fuller and Harley 2004:5), which materially and semantically are the foundation of the growing air traffic. The driving force behind such increasing global air travel is a growing cosmopolisme (Beck 2002; Habermas 2001), which has the ‘cosmopolitan tourist’ (Bauman 1999) as the dominant character. In relation to this, the airport has by some been interpreted as a pure ‘flow machine’ (Fuller and Harley 2004), as a “mono-cultural zero-friction enclaves” (Hajer 1999) or as a sort of ‘third culture’ (Eriksen & Døving 1992) that exists outside or on the side of the normal cultural context in modern societies. However, such theoretical optics tend to romanticise and over-interpret the hybermobile nature of the airport (Gössling & Peeters 2007). The case study of MCIA presented in this article shows that the mechanisms of power and exclusion are not only confined to the airport or airport city itself, but also active in the surrounding urban areas. Based on the analysis in this article, it must therefore be stressed that airports cannot be studied detached from its social and material contexts. Airports do not live outside existing social structures and spaces. Airports are always socially and materially located somewhere, and are always connected with various social consequences. However, a problem of increased international air traffic is that the social consequence of aeromobility - whether it is the family consequence of the air travellers, the health problems of the airport workers or the people
living in soundings areas - have been removed from the eyes of the cosmopolitan travellers. Social consequences of air travel are for the western cosmopolitan travellers something that happens beyond the smooth surface of the modern airport: at the left luggage office, at invisible surroundings areas or in another non-industrial city or country. However the social consequences for the airports neighbours feel very real and very fixed. The residents of these urban areas are archetypal ‘vagabonds’ (Bauman 1999). They - both literally and idiomatically - live with the consequences of the hybermobility, as observers, without the ability to change their own life situation. This illustrates that increasing aeromobilities means new possibilities for some while for others it means a number of new limitations in their everyday life (Lassen and Jensen 2004).

We will end this article by pointing out that hopefully this is the first contribution to a greater attempt to understand the social consequences of the rising global air traffic. There is a great need to explore this area much more in the future, especially in order to establish an improved knowledge base for planning and policy in relation to handling a number of the social problems attached to increased global air traffic.

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