Understanding theoretical model of Atlanta Aerotropolis based on literature and global design models.

Faculty Advisor:
Dr. Perry P Yang
Director, Eco Urban Lab,
Professor, City and Regional Planning
Georgia Institute of Technology
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1. **Introduction.**

Cities— the places of exchange between humans and the environment, the centers of exchange of information and commerce. These cities have grown over the years backed by long hours of sweat and energy, creating a space for all the vital operations of urbanity. The cities are modern-day gateways for their development and act as a catalyst for business growth for their countries and regions. One of the most profound changes that a single entity can bring into city dynamics in contemporary times is the airports, as they are experiencing a shift from their primary function of transportation, they are evolving into more complex and dynamic elements of the city. They are creating new business avenues evolving into an ecosystem of business, industrial and urban activities by modifying their role from an infrastructural component of the city to a more dynamic participatory spaces creating avenues of economic transactions and social order of the city. Airports are at the new central nodes of city systems but majorly they act as the heart of urban transportation systems; they bring all the liveliness to the cities and create a bond between different geographies and activities. Airports around the globe are going into this new phase wherein they are evolving into more complex institutions tackling not only the mobility aspect of the city but also taking a major part in economic generation and social dynamics in the morphology of the city. The information and technology boom has changed the operational efficiency of the airports and evolved them into more efficient entities, what many of us call smart infrastructure, and are leading to this new understanding of urbanity commonly refers to aerotropolis. With each passing day airports are becoming the new ventures for activity and this active center is used as a new economic region with a sequential airport centric development. This new form of development is creating more challenges both for the airport and the vicinities around the airport in simpler words it leads to more complex relation between the airport and the city. Although, it is agreed upon that investment in cities stabilizes tax bases and enhances the economic activities in the city and enhances civil culture and movement in the city. But the issues of politics, race, and other aspects of the social fabric also actively take part in all actions within the city and therefore create a new equation of development which occasionally is not equitable and sustainable leading to dislocation and displacement which is the least desirable act.
in any city. The idea of new form of development (aerotropolis) in the city in many aspects is like
the revitalization of the part of the city and brings in increased funding for services. Theoretically,
aerotropolis development is designed to understand and optimize solutions for the existing
complex relationship of airports and the cities by bringing in more private and public partnerships
to create more livable spaces. Ideally, the newly formed smart airports, as a part of the
aerotropolis development could tackle some of the major issues of the cities like urban sprawl,
the last mile connectivity and some issues of social justice due to increased usage of technology
and information of design systems.

For Atlanta, Hartsfield-Jackson Atlanta International Airport is the world’s busiest airport
and has been the busiest in the world for 21 consecutive years. With nearly 300,000 passengers
daily, it had more than 100 million passengers in 2019. The airport employs more than 60,000
people to uphold such a massive operation. Compared to metro Atlanta’s $270 billion GDP in
2013 it has risen to $439 billion, making it one of the most sought places for business and
employment. All walks of life want to try their luck in this expanding city and that is one of the
reasons there are hundreds of thousands of students coming for education and employment in
this city. The impact of any form of new development in the city would be felt by the city and
specifically by the neighboring area of that development and in this paper, I would try to
investigate this dynamics of the aerotropolis and the neighboring areas of the aerotropolis
boundary. This paper looks and reviews the existing literature on aerotropolis, global design
models and anatomy, and a discussion of aerotropolis development in Atlanta followed by
methodologies, and research question and will conclude with recommendations in the form of a
policy for Atlanta’s aerotropolis development as a neo-Atlanta.
2. Literature Review:

2.1 Aerotropolis

The idea of an Aerotropolis is usually credited to Kasarda, who argued airports are 21st-century seaports in terms of urban development as a human effort to efficiently use physical geography. His idea explains a subregion wherein the centrality of economy, land use, and infrastructure are an airport city as an aerotropolis. The main aim of this subregion is worldwide business connectivity at higher speeds. The idea of an aerotropolis stems from much older times, the records mention this concept was diagrammed by Nicholas DeSantis in the November 1939 issue of Popular Science (Chohan, 2019). Furthermore, an aerotropolis is often defined as an airport city, however, the first air city with commercial activities was founded in the 1920s. The codification of airport city as a concept was done by McKinley Conway from early 1950 onwards (Appold, 2013). Kasarda came up with an idea of Aerotropolis being a new urban form with a symbiotic relationship between commerce and multimodal transportation and as per him, “An aerotropolis is a metropolitan subregion whose infrastructure, land use, and economy are centered on an airport. Similar in shape to the traditional metropolis made up of a central city commercial core and its outlying commuter-linked suburbs, the aerotropolis consists of a multimodal airport-based commercial core (airport city) and outlying corridors and clusters of aviation-linked businesses and associated residential developments that benefit from each other and their accessibility to the airport” (Kasarda, 2019). The new development of airports as per him is an evolution of aeronautical infrastructure to a complex multifunctional enterprise that fosters development beyond airport boundaries. It is acting more than a gateway, it is acting as a city well more precisely a city within a city, a driver of regional growth beyond its official limits. Even though Kasarda has promoted the concept of aerotropolis but there is still ambiguity in the definition of aerotropolis and there are multiple usages of the term, sometimes it means an aviation-intensive global economy, and sometimes aerotropolis simply a busy airport, thus adding more to confusion (Appold 2013).
2.2 Model of an Aerotropolis

As defined by Kasarda, a new urban form that keeps the airport city at the central core surrounded by aviation-oriented businesses is an aerotropolis (Fig 1: Spatial model of Aerotropolis). Aerotropolis is like a metropolis in terms of its composition and function as both stem out from a central business district and branched out by connectors of modern-day mobility systems which ideally are inter-modal public transit systems. However, the uniqueness of an aerotropolis lies in its potential of being a higher-order nexus of interchange due to the proximity of an aviation-based mobility system.

In other words, the aerotropolis as a concept is more dynamic and forward-looking and its evolution will depend on the global integration and expansion of air connectivity. Its impact will be wider and deeper in the 21st century as compared to the impact of highways and railway terminals in the 20th and 19th centuries respectively.
2.3 The Anatomy of Aerotropolis

Aerotropolis is formed from three interdependent elements but analytically separable, the spatial, the functional, and the connectivity element. The aviation-oriented business present in the core and the outward residential development present both near and along the mobility corridors of the airport and this arrangement makes it as the spatial element of the aerotropolis, this spatial form generates the physically observable form of the aerotropolis. The economies associated with spatial elements widely dispersed throughout this physical region form the functional element of the aerotropolis. The connectivity element in this triad which provide accessibility to the aerotropolis is the air routes along with other forms of surface linkages e.g., the highways, and the rails systems (Fig:2).

![Elements of Aerotropolis](image)

All these elements taken together affect the development, and investment mobility of the aerotropolis, the principles governing the planning of this form are as:
I. Aerotropilis are increasingly becoming major collective good, therefore maximum long term value creation should be the goal instead of short positive financial returns for a single party.

II. Aerotropolis is a holistic development so it should be ensured the direction of both aerotropolis, and local urban development must be a part of the broader investment in commercial location systems.

III. It is fundamentally a collaborative venture, therefore, aerotropolis planning needs not only to consider the potential costs and market considerations but also the impacts on investment by other stakeholders like local government, airline companies, etc.

IV. In the aerotropolis planning system, the principle of form follows function apples, therefore the local real estate demand needs constant analysis for unmet business needs.

V. As per Kasarda, “the 3A’s (accessibility, accessibility, accessibility) supersede the 3L’s (location, location, location) as the pertinent commercial real estate development principle”. (Kasarda and Appold, 2014).

VI. The evolving economies of speed, scale, and scope decide the success of any aerotropolis.

VII. The residential communities in this kind of development should be in proximity to aerotropolis job clusters with efficient transportation.

VIII. Ideally, the re-densification around the airports due to aerotropolis development can be an antidote to urban sprawl and additionally adds to the imageability and sustainability of airport areas.

IX. The measure of aerotropolis success lies in collective regional wealth, business revenues, and inclusive nature of quality of life generated.

X. Last, but not least, the aerotropolis development is integrated planning between airport planning, urban planning, and economic planning of the site, and the absence of this integration will impact the goals of the aerotropolis, it could be visually efficient but economically and socially challenged or both cases and vice versa.
2.4 The Effectiveness of Aerotropolis

The effectiveness of Aerotropolis is essentially based on the principles of urban planning and sustainability principles well-structured and usually long-term oriented ones. Kasarda also mentions, “Some aerotropolis development responding to organic market forces with lack of long-term goals and proper planning has created bottlenecks and inefficiencies in this form of development” (Kasarda, 2004). The factors that have been found conducive to the operation of a well-functioning aerotropolis are as mentioned:

1. Connectivity: The effective connective means a maximal connection to other network nodes thereby creating a multiplicative aspect for the density of the connections and these connections acts a neural network for the aerotropolis.

2. Smart Infrastructure:
The smart infrastructure will keep the functionality of the aerotropolis efficient as it will help in better management of the complexity of logistics and mobility for the aerotropolis.

3. Special Economic zones:
The especial economic zones create incentives leading to boosting exports and enabling more goods to be landed, stored, and handled eventually leading to increasing economic gain.

4. Logistics:
Due to rise of the internet-based communication and transactions, e commerce is prioritized in this new form of development to improve response time in the logistics section of aerotropolis.

5. Technology and Innovation:
The technological advancement helps in better management of resources and makes the maintenance and regulation of the different processes of various components of aerotropolis development.

6. Intermodal Freight Hub:
The idea of collectively bringing all modes of mobility (airways, waterways, railways, and roadways) comprehensively together is aimed to build an Intermodal freight hub. It will make the
whole system of logistics efficient by reducing cargo handling, improving security, and helping in better transportation- a valuable element in Aerotropolis.

7. **Corridors:**
The office corridors which are air travel-intensive add an important commercial element to the aerotropolis, as they connect users to the distant markets more efficiently and these corridors lead to the formation of business centers at the closer proximity to the airports.

8. **Exhibition area:**
Another important space in modern day development is the exhibitions and conference centers as they gather and exchange knowledge, best-practices, and commercial ventures.

9. **Entertainment Cluster:**
The entertainment cluster diversifies the use of aerotropolis, it expands its portfolio and makes it a truly livable city. These clusters attract and tackle both to local needs as well as long-distance travelers, thus leading to more employment generation in the city.

10. **Medical and Wellness Cluster:**
A key value-added segment is the medical and wellness cluster, providing the healthcare for the aerotropolis but additionally leads to medical tourism – anew avenue of creating economic activities.

11. **Residential Areas:**
The residential areas are major location of housing in aerotropolis, and it also adds to urban quality of the project when it is used with mixed use development, making the whole development participatory and active. It leads to long term public engagement and leads to value creation in terms of physical assets.

3. **Aerotropolis Around the World**

3.1. **Hong Kong International Airport**
Hong Kong International Airport ranked 8th in 2018 for passenger traffic among the largest airports in the world (74.517.402 passengers, List of busiest airports by passenger traffic, 2019) and 1st in 2017 for cargo transshipment (5.049.898 tonnes, List of busiest airports by cargo traffic, 2019). As per the Fact sheets, Hong Kong International Airport (2019), the number of
flights per hour reached 68 in 2018 and the airport apron provided 105 parking places for passenger planes, 43 for cargo planes, and 33 for aircraft under maintenance or parked for a long period. Hong Kong International Airport was opened at the beginning of July 1998. The main part of the airport consisted of two parallel runways (3800 m x 60 m) and Terminal 1, with an area of 570,000 square meters. At the same time, the Airport Express rail link began service along with an already built 5-star hotel belonging to Regal Hotels International group. In February 2007 the construction of new Terminal 2 was completed, much smaller than Terminal 1 but it contained the facilities rarely seen at the airports such as the IMAX. This was the beginning of the new usage of airports, the 10 million square feet business and entertainment peninsula called SkyCity has been built on the property of Airport Authority Hong Kong, this entertainment facility caters to and targets both domestic and international fliers for promoting regional economic growth along with the traditional tole of being a transportation hub. The first phase of SkyCity opened in 2007, with a trade center, an expo center, Sky Plaza, Sky Pier, and a nine-hole golf course. as shown in Fig: 3 and Fig: 4

Fig 3: Elements of SkyCity
Source: SOM
The World Trade Center consists of an exhibition center, retail, office and hospitality spaces, and other recreational venues and is directly connected to the rail terminal. The Sky Plaza offers offices, a business complex, and a shopping mall integrated with the passenger Terminal 2. A cross-boundary ferry service to China is provided via Sky Pier, there is no customs clearance imposed by Hong Kong authorities and it is done without any immigration formalities. The extension of the multifunctional infrastructure close to the airport was completed in 2010 when a ferry pier opened to the public connecting Hong Kong International Airport with Mainland China and Macau. In 2018 Hong Kong International Airport employed 73,000 people becoming the largest employer on Lantau Island (Fact sheets, Hong Kong International Airport, 2019).

The SkyCity development was designed with the strategy of making a completely self-contained community transforming it from being a component of a city to a city in itself. The master planning was done in such a way as to maximize the benefit of the location of Terminal 2 and integrate the commercial usage and form a multimodal transportation nexus, where air,
marine, ground, and rail transportation are merged seamlessly. The location of Hong Kong International Airport (HKIA) is a gateway to China and other international business centers in Asia. It is located within five hours’ flight from half of the world’s population, HKIA is the third busiest international passenger airport and operates the busiest international cargo facility in the world (Airport Authority Hong Kong, 2011).

3.2. Incheon International Airport: New Songdo City

The Incheon International Airport is a gateway to more than 1/3rd of the world’s population in just 3½ hours of flying time. It is a few hours away from one-half of the world’s population of China, India, Japan, and Russia, a strategic location. The new Incheon Foreign Airport was the eleventh busiest airport in the world in terms of international passengers in 2006, the fifth busiest airport in terms of cargo and freight, and the eighth busiest airport in Asia in terms of passengers. Songdo International City or Songdo Intelligent City is located approximately 40 miles from Seoul and only 7 miles from Incheon International Airport (See Fig.5). It was built on the 1,500 acres of reclaimed ground along Incheon's waterfront. It is the largest private-sector development in the world and is being constructed by a partnership between POSCO E&C, the largest steel production in South Korea, and Gale International (a developer from New York City). The construction of Songdo International City, built on reclaimed ground near Incheon on the Yellow Sea, commenced in 1994. The first modern sustainable city in the world intended to be a global commercial district, the city made its public reveal on August 7, 2009. This $30 billion project provides around 40 million square feet of commercial space, 35 million square feet of residential space, 10 million square feet of retail space, 5 million square feet of hospitality space, and 10 million square feet of public space (Songdo IBD, 2011).
The holistic idea of this development was to make it a self-contained living and business district accessible globally for business and investment. As a result, it is now a thriving center for international businesses, knowledge centers, research and development centers, leisure complexes, and top-of-the-line healthcare facilities. Adding to it, this aerotropolis development was designed as the first sustainable city in the world with an emphasis on sustainable design principles. It is the part of LEED Neighborhood Development Pilot Program, which is focused on mass transit-oriented development and smart growth. The Incheon Aerotropolis development created the Incheon Free Economic Zone in 2003 as a part of their market-oriented investment model to bring in more international finances near the development. In less than a decade this free zone has attracted over US$3.6 billion of foreign direct investment (FDI) and by 2027, the Incheon Free Economic Zone is aiming at an investment of US$71.5 billion from both domestic and foreign firms.
3.3. Memphis International Airport

Memphis is 400 miles south of St. Louis and 640 river miles north of New Orleans, centrally located on the inland waterway system. It possesses the fourth largest inland water port in the U.S. Memphis is also located centrally in the national rail network and the metropolitan area of Memphis is served by five Class I railroads which means more than 200 trains per day travel through Memphis. Memphis has an important location based on waterways and railroad systems along with a pivotal position in the national highway network and freight corridors. The Memphis Aerotropolis is built on three main economic pillars, logistics, tourism, and bioindustries. The reputation as America’s Distribution Center is the major claim of Memphis Aerotropolis based on the scale of logistics it handles. Memphis on the tourism map was placed due to its long association with Blues, the birthplace of rock and roll and the gateway to Tunica Resorts. The tourism-related activities and transactions form an essential component of the regional economy. The new economy of bioscience innovation and research is adding to the already existing component of economy of medical and health services of Memphis. This new sector has an immense potential for the future of Memphis, and these industries and should be nurtured and leveraged. Memphis faces present and potential competition from several other mid-continent airports in air cargo hubs that have grown largely based on national distribution systems. The different components of Memphis International Airport could be seen in Fig 6. Memphis is well known as the busiest transportation hub for decades in the United States.
Its airport cargo hub is the second busiest airport cargo hub in the world and is home to the fourth-largest inland port along with massive rail and trucking distribution.

The major avenues of employment and job creation have been freight distribution and associated industries adding $28.6 billion per year into the regional economy. The Memphis Aerotropolis development has been more spontaneous and largely unsystematic and unplanned in various areas, making it inefficient on aesthetic and social considerations. Also, the sustainability part and environmental concerns have never been the priority diminishing slightly its economic efficiency. The heart of Memphis Aerotropolis development is the Lamar Corridor shows signs of uncoordinated strategies, lesser community participation, and weaker transportation planning, with the result of increased rates and concentration of poverty around the spillovers of the boundary. There is an immediate need for infrastructure upgradation as the major structures are very old and the approach via transportation links are not very well
thought of leading to more traffic congestion and seriously saturating the logistic supply. There is a visible racial segregation in the city with the areas of higher concentration of colored people having high poverty rates and less income.

However, in the last few years, there have been some major changes to revamp the image and make the aerotropolis an efficient affair. Quoting Dexter Muller, senior VP of Community Development for the Greater Memphis Chamber (GMC), “some of the improvements we made in the past few years, we’ve spent about $65 billion on transportation projects.” Memphis aerotropolis is now focused on marketing and branding its development and looking into environmental considerations and beautification of the metropolis. They are seriously thinking of upgrading and improving their capacity as a logistic and distribution face in the south of the United States. The Highway 78 corridor is one of the important steps taken for better and more efficient connections with other parts of the state as it will connect Memphis to Interstate 22, connecting it with Birmingham, AL.

4. Research Question

As discussed earlier the aerotropolis development strategies are holistic way of addressing the complexities of a city via airport infrastructure development and upgradation as seen in Incheon International airport. As a result of aerotropolis strategies the Incheon Aerotropolis development created the Incheon Free Economic Zone in 2003 and this successful intervention created a niche in the world map of financial activities and within a decade changed the whole scenario of Incheon by bringing a foreign direct investment estimated to be a little less than four billion US dollars. Will the evolution of Hartsfield Jackson Airport into Atlanta aerotropolis lead to a new pattern of Atlanta’s cityscape? Will aerotropolis strategies create a similar ecosystem for business both for domestic and international actors who are interested in investing in United States?
5. Methodology

I intend to use already existing qualitative and quantitative data from the neighborhoods of Hartsfield Jackson Airport collected by various agencies in Metro Atlanta. I am analyzing the data to identify any patterns or trends occurred due to the aerotropolis development and comparing them with the global case studies. as a case study to test the evolution of the airport into a smart airport and its impact on the neighborhood areas. Altogether it would be a mix method approach to understand comprehensively the impact of this new form of development on the neighborhood of Atlanta aerotropolis.

6. Atlanta aerotropolis - Spatial and Social Analysis

As per the official figures from the website of Hartsfield-Jackson Atlanta International Airport, an average of 275,000 passengers a day, and 2,700 arrivals and departures daily, making it one of the world’s busiest airports. Furthermore, about eighty percent of the United States population is within a two-hour flight from Hartsfield-Jackson Atlanta International Airport. As per the official figures of Invest Clayton, there are three main air cargo complexes, the total on-Airport air cargo warehouse space measures 29.8 acres (12.1 hectares) or 1.3 million square feet with three main cargo complexes, North, Midfield, and South, a Perishables Complex, and a USDA Propagated Plant Inspection Station. Hartsfield-Jackson is the state’s largest employment operation, generating a $34.8 billion economic impact for metro Atlanta with more than 63,000 airlines, ground transportation, concessionaire, security, the federal government, City of Atlanta, and Airport tenant employees (Invest Clayton, 2023). The bigger challenge is to understand the impact of Hartsfield-Jackson Atlanta International Airport on the aerotropolis development and its impact in the spillovers of its official boundary into the metropolitan Atlanta area.
7. Existing Land use around Atlanta Aerotropolis.

The existing land use as shown in Fig. 7 explains the different activities present around the Airport boundaries. The local governments have high localized control of land, thus under the impact of various localized jurisdictions. Adding to it, the areas in proximity are also influenced by restrictions imposed by the Federal Aviation Administration (FAA) subject to certain distances and flight paths of the airport.

The illustrated map for existing land use depicts the largest land use is housing (38 percent) followed by industrial (13 percent) and commercial (11 percent). The land use trend for residential is very similar to any US city, the major chunk being single-family housing. As seen in our previous case studies we found that this new form of urban development is more focused on commercial land use rather than residential land use, so we can safely posit that there is no major impact on the dynamics of this new urban form of development in the vicinity of the
airport, and the city is still developing in the usual form of residential extensions. However, it cannot be concluded that there is no impact of aerotropolis in the development of the cityscape. Ideally, with aerotropolis development, there should have been more polycentric regions linked with mixed-use centers based on business interests to create more economic activity. However, there are no drastic changes in land use signifying the least impact of land use evolution as the traditional approach of urban planning acknowledges the interrelation between land use and regional economic activity. It is evident that if the outcome is not what is forecasted by the literature of aerotropolis development and global case studies, there is a discrepancy in both land use planning and land use regulation. As explained by Jae Hong Kim (2011), borrowed from the idea of Hopkins, "Regulations [are]... enforceable assignment and reassignment of rights. Regulations affect the scope of permissible actions. Plans... provide information about interdependent decisions about expected outcomes but these plans do not directly determine the scope of permissible actions". In simpler terms, it could be stated as there is a distinction between land use regulation and land use planning.

Additionally, the predominantly residential development around the aerotropolis boundary has historically been of single-family housing. Single-family home—the popular American dream of homeownership, a detached house with a yard and a car or a two Infront of a white garage. Like many cities the residential areas— the single family houses in Atlanta came through the expansion of the middle class which was initiated by the institutionalization of accessible mortgage markets after the great depression and this increased footprint of the middle class spiked the U.S. homeownership rate from below 45% in 1940 to over 60% by 1960, and then more gradually until 1980 (Fetter, 2013; Spader, McCue, & Herbert, 2016). The Single-family houses formed only 20 percent of the renter ratio in 1970 and shrank further in the 1990s but in the aftermath of the U.S. foreclosure crisis of the late 2000s, there was a greater movement towards renter ratio in the single-family housing stock and almost as 9.4 million households lost their homes during the foreclosure crisis (Rosen, Bank, Eckstein, Stern, & Tcheau, 2017). As per the Data from the American Community Survey (ACS), the number of single-family (one-unit) rental homes increased by approximately 2 million units from 2006 to
2015, from 3.8 million to 5.8 million in the 50 largest metropolitan areas of the United States. Atlanta also saw the similar trend in the rise in renters in single family housing as it became increasingly difficult to own a home. As mentioned by Daniel Immergluck (2018), the Atlanta metro area experienced one of the largest increases in single-family renter ship among the 50 largest metropolitan areas. This increased number may have substantial consequences for the rapid decline in homeownership rates.

Source: Author, GIS.

Map: 1
There is a large portion of the population living in the vicinity of the aerotropolis that are paying 30 percent or more of their gross income as rent as shown in Map 2. This high portion of the rent is from their savings, thus a stressed life. Theoretically, the new form of development should improve livability and should lead to better choices of economic activities and better living. However, the results are depicting a different story and it is evident there is a missing link in the idea and practice of aerotropolis development in Atlanta. It’s an interesting phenomenon to witness these low-income housing emerges around Atlanta airport, which is so different from Kasarda’s “model of Aerotropolis”. We may hypothesize that
it’s because ATL airport planning has seen the airport as an infrastructure, and not an aerotropolis for economic integration, an exclusive transportation system that divide the global transport hub from its surrounding urban areas. There is a high possibility that the edge effect of the airport, including poor connectivity and low accessibility of the neighborhoods and noise environment from the airport degraded the airport surroundings urban environment and therefore move the low rent housing to these locations.

8. Existing Demographics around Atlanta Aerotropolis.

As mentioned previously, the single-family renter ship rates increased in all 50 large metro areas, with an overall increase from 11.3% to 16% from 2006 to 2015. In metropolitan Atlanta, the increases in SFR occurred across the region but were particularly large in diverse suburbs from 2010 to 2015. According to the regression analysis of Daniel Immergluck (2018), the neighborhoods with colored population (Black, Asian, and Latino) saw greater increases in SFR controlling for other neighborhood characteristics. Raymond, E, et al. (2016), found that race and ethnicity are strong predictors of the housing market trajectory of a neighborhood, even after controlling for the other independent variables. As per their research, a ”one-percentage-point increase in percent black, after controlling for these other variables, increases the odds of a neighborhood falling into the Bust-Partial Recovery cluster versus the Full Recovery cluster by 19.8 percent. Similarly, a one-percentage-point increase in percent black is associated with a 19.2 percent increase in the odds of a neighborhood falling into the Bust-No Recovery cluster versus the Full Recovery cluster”. The work is not aimed at identifying any causation, the numbers do not imply the lowering of property value was directly related to the influx of black residents. There could be several reasons for the lowering of value, it could be higher unemployment rates, the decline in household wealth, and tighter credit markets to name a few. However, the research signifies the housing market trajectories were distinctly linked to racial and ethnic characteristics as the research showed a consistently strong relationship between black neighborhoods and steep rates of price decline. On the other hand, the research showed that in areas with a predominantly white population, middle- and upper-income neighborhoods are less volatile and recover faster in terms of stress. The large population that
is around the five-mile and ten-mile buffer around the Atlanta aerotropolis boundary is predominantly African American ancestry as shown in Map 02. As shown by research by Immergluck, minority communities suffer more and have more chances of foreclosure in times of economic stress and are less likely to receive effective remedies for recovery. It is highly important to have an inclusive development around the buffers of Atlanta aerotropolis and change the uniform ethnic nature of the housing stock so that there would be no minority neighborhoods targeted with poorly underwritten loans. As argued by Raymond, E., Wang, K., & Immergluck, D. (2016), “Each one-percentage-point change in the initial Hispanic population in a zip code is associated with 0.14 percentage-points less increase in the home value index. A one standard deviation increase in percent Hispanic (17.8) is associated with a 2.5 percentage-point decline in 2001–2014 home value appreciation”.

Source: Author, GIS.  
Map: 2
The diverse demographic population will also help in preventing the tight credit faced by the black population for home purchase loans mentioned by Goodman et al. (2015), he explains tight credit as the number of home purchase loans to black borrowers in 2013 was 50 percent less than what it was in 2001, before the subprime boom.

9. Unemployment and Poverty around Atlanta Aerotropolis.

The evolution of airports from transit hubs for passengers and cargo to essential and instrumental sites and forms of infrastructure for socioeconomic development happened due to increased globalized trade (Bogdanski, 2014). As Kasarda estimates 40 percent of the total value of international trade for high-value and low-weight shipments is accounted for by global air transportation. The idea of the aerotropolis was to utilize this number to address high levels of poverty and unemployment and inequality through this new form of urban regeneration. It could be very fruitful in addressing these complex problems of our modern cities as argued by Ngwenya, et al. (2022) whilst looking into The Durban Aerotropolis strategy for sustainable socio-economic development. However, there is a difference between adoption and implementation thus not meeting the intended economic benefits of this form of development. Theoretically, the aerotropolis strategy should have a substantial spillover effect on the socio-economic environment and should adjust the livelihoods of the neighboring communities. As mentioned by Warin & Svaton (2008), aerotropolis can act as a full factor for various population groups in different geographic locations. In the research of Ngwenya (2020) for the Durban Aerotropolis, it could be seen that the regional Gross Domestic Product has increased through the active contributions of businesses within through an increased supply and demand mechanism. The appetite of business is growing due to increased passenger and cargo volumes in Durban Aerotropolis and ideally the case should follow in the Atlanta aerotropolis following a similar strategy based on the increased volume of passengers and cargo with an average of 275,000 passengers a day, 2,700 arrivals and departures daily. The volume of cargo in the 2022 fiscal year from the Hartsfield–Jackson Atlanta International Airport uplifted over 730,046 metric tons. (See Fig, 8).
Whilst looking into the data available from Atlanta regional commission, I found that the large population that is around the five-mile and ten-mile buffer around the Atlanta aerotropolis boundary is under poverty, ranging from 13 to 18 percent as shown in Map 03.

Additionally, the aerotropolis development banks on creating more employment and business transactions in the aerotropolis and a major part of spillover for the neighboring areas.
However, the five-mile and ten-mile buffer around the Atlanta aerotropolis boundary is showing higher unemployment rates ranging from 5 to 8 percent as shown in Map 04. The phenomenon of unemployment is associated with various negative effects, it holds one back from finances, social contacts, and time management. It in some ways also educate, knowing the rights, and brings in more skills to be acquired. These could collectively or individually lead to very difficult circumstances and could lead to various negative social and health consequences. This stressed life will never improve the quality of life it will lead to a reduced quality of life for the individual as well as the part of his neighborhood. Although the term ‘quality of life’ could be both subjective and objective. According to the WHO, the term is identified with the individual’s position in life, in the context of the environment in which he/she lives, the system of values he/she believes in, and his/her objectives, expectations, standards and fears (The WHOQOL group 1995).
The outcome of unemployment is ill health, a higher death rate, poor mental health, and greater drug use as found by Claussen et al. (1993). The increased research over the years has found a relationship between unemployment and health, one body of research indicates the ill effects on health are caused by stress and income reduction leading to adverse behavior and poor health choices due to unemployment. Raphael, S., & Winter-Ebmer, R. (2001) found out that, “Unemployment is an important determinant of property crime rates. The strong effects on property crimes exist in models of aggregate property crime rates as well as models of the individual felonies”.

10. Commuting and Vehicle Availability around Atlanta Aerotropolis.

The United States is quite infamous for automobile dependence, and it has raised many concerns, ranging from personal health to global sustainability. It is quite a polar opinion and scientific literature backs the argument of automobile dependency and sedentary lifestyle. At the individual level, this sedentary lifestyle is leading to chronic disease conditions like obesity, and diabetes to name a few (Frank and Engelke 2001).

Source: Author, GIS.
Map:05
Yet there is no change or any sign of lessening reliance on automobiles in national travel surveys. The automobile’s share of urban travel in the United States increased from 81.8 to 86.4 percent from 1969 to 2000, coupled with a 72 percent increase in total trips (Pucher and Renne 2003; U.S. Department of Transportation 2003). This increased commuting time has serious social and environmental problems in a physically fragmentizing city. The five-mile and ten-mile buffer around the Atlanta aerotropolis boundary as shown in Map 05 is depicting 11-17 percent of households without any vehicles and are reliant on other modes for their commute. A major portion of this ratio may use public transport and it is also quite possible they use some other forms for commute, it could be walking, cycling, or carpooling. However, it is important to realize that public infrastructure for mobility is highly needed in and around aerotropolis development. Whilst working on the respective data it was found there is a larger proportion of masses using public transportation, ranging from 4 to 49 percent as shown in Map 06.

Source: Author, GIS.
Map:06
There are two ways of improving the employment avenues around the buffer spaces of the Aerotropolis boundary, either invest in public transportation and create better and more efficient infrastructure for public mobility or modify the land use from residential to mixed-use so that improved job proximity would be created by providing affordable housing close to employment concentrations to enhance the quality of life.

11. Migration around Atlanta Aerotropolis.

The immigration of highly skilled people from place to place adds to the diversity and improves the domestic human capital stock and is a crucial fact in improving the economic conditions of a place. The population distribution is related to economic development and is closely influenced by the push and pull factors. It was Heberle 1938 who introduced this concept of push and pull in his works while explaining the causes of rural-urban migration. From the works of Lee (1966), it could be argued there are general indicators that apply to understanding the intercity migration and they are, employment status, economic development, environment, and public service. The determination of specific indicators of the four dimensions is as:

a. Employment status: People follow jobs or industries and the employment opportunity in any city forms an important factor pulling in people and leading to migration. However, there are two aspects that characterize the employment status, the number of jobs and the actual labor absorption of the city.

b. Economic development indicators: The economic development indicators like average housing price, average rent, and per capita GDP also act as magnets attracting or repelling people leading to intermigration of the city. The most important aspect being the average residential housing price/rent which is usually used by the migrants to calculate their move to a specific location in the city.

c. Environmental and public service indicators: The environmental and public service infrastructure is also a good measure to understand the dynamics for intercity migration. The quality of education or health care influences a lot of people to change their location and move to a different neighborhood.
People are sensitive to social amenities and are more comfortable in the areas of better infrastructure of medical resources and public transportation in addition to positive employment opportunities as argued by Dotti et al. (2013). Meanwhile, the aerotropolis development is based on the idea of providing more employment opportunities and creating better infrastructure, thus it should ideally attract a lot more people to the center. As witnessed in the data there has been an increased intermigration in the vicinity of the aerotropolis boundary in Atlanta as shown in Map 07. There has been a 15 percent change in people moving and living in a different county just in one year. These observable migration patterns may or may not be a result of aerotropolis development but looking at the previous set of data and activities it seems the missing infrastructure could also lead to this observable migration in the outer buffers or spillovers of the Atlanta aerotropolis boundary. However, there is hope in this new form of urban development as seen globally, the positive pace of aerotropolis development is a blessing in disguise for addressing various problems of modern cities.
12. Lessons Learnt

1. The Aerotropolis have multiple operations that are distinct and based on the geographic location they are sitting in. Every development has a unique selling proposition, nature, opportunities, and challenges associated with them with an added layer of the location it serves or influences. During my investigation analysis of data for Atlanta aerotropolis development I found that Atlanta airport has a unique location, and it can cater more than 300,000 passengers. This argument is based on the fact that Atlanta aerotropolis is not branded and marketed the way it could be, it is presented just like other aerotropolis development wherein you present the nexus of multi-modal mobility and their easy access to various services. However, Atlanta is more than a multi-mobility nexus, this city has a historicity not only in terms of social movements but in big businesses which could be leveraged to make this new form of development much larger, more efficient, and more accessible for the larger audience.

2. The goal of aerotropolis development is to operate on the area and build on the strengths and opportunities it provides for business, leisure, or tourism. The location should be strategically utilized and optimized on the lines of modern technology for efficient and sustainable living. During my analysis I found out that there is a missing link in aerotropolis strategies and the results on the ground, according to Kasarda’s “model of Aerotropolis” the area around the boundary of aerotropolis should benefit from the spillover of aerotropolis but the case on site is different, there is an increasing trend in low-income housing emerging near the ten-mile radius buffer from aerotropolis boundary. I am hypothesizing that aerotropolis planning is not looking into this development holistically, it seems the infrastructure understanding of this development has a higher say in this new form of development.

3. The aerotropolis development leads to enhancing wayfinding and believes in place creation and adds more value to the location and builds more connections and networks for the betterment of the quality of living directly or indirectly. The strategic goals on paper are in line with Kasarda’s “model of Aerotropolis” but the realities are different, the connection to the nearby areas neighboring the aerotropolis buffer is the weakest. Additionally, the low-income residents living in the ten-mile radius buffer from the aerotropolis boundary have limited access.
to private vehicles, 18 percent of the people have no vehicles for their daily commute to work and other activities. The less vehicle ownership sound great and works great, only if there is high connectivity of public transport, unfortunately the public transportation in this area is considerable weak. The spatial mismatch for the residents of Atlanta (where residents have the greatest need for high-quality public transportation but have access to some of the least-developed levels of transit connectivity) is quite visible, particularly in the areas which has low-income population or higher concentration of people of color.

To sum it up, I believe Aerotropolis development has a unique role, tailor-made to serve the city or the region. The promise of this form of development is an inclusive development, rich on diversity, socially accepting, technologically advanced and environmentally conscious with sustainable strategies which are unique to a place.

13. Policy Recommendations

As seen in the discussion above about the development of Atlanta aerotropolis I suggest a few policy recommendations for the augmentation of the existing and future development strategy for a wider and more efficient reach of the development. The recommended policies could help Atlanta aerotropolis in its metamorphosis as the strongest anchor institute for the development of Metro Atlanta in general.

   A. Intergovernmental Collaboration.

One of the complexities of the Atlanta aerotropolis is its location in multiple counties, the imaginary boundary of the twenty-mile radius for the aerotropolis as defined by Kasarda for Atlanta aerotropolis lies in ten counties of Georgia (Clayton, Cobb, Coweta, Dekalb, Douglas, Fayette, Fulton, Henry, Rockdale and Spalding). The ambitious plan visualized for this development cannot be achieved until and unless a common platform wherein everyone is brought to common terms for the greater development of the aerotropolis. This could be done by the recommendations put forth by Kasarda and Appold (2008), regional revenue sharing, and intergovernmental agreements. The regional non-profit organizations could help in consensus-building between local governments. On examining the vision and strategies in the
aerotropolis Atlanta blueprint, it talks about working together of public and private partners and establishing an organizational framework for this coalition. However, it does not mention specifically what partners and does not mention any roles, it seems more of a generalized strategy without establishing any working groups and establishing any collectives. To my understanding Atlanta aerotropolis should work on this specificity of the organizations and their functions and specifying their roles and possibly all potential funding for these kind of activities in their upcoming blueprint for the development and most importantly there should be a specific timeline for moving forward wherein the mention the immediate, mid-term and long-term goals for the development.

B. Promoting Mass Transit.

As mentioned earlier, Atlanta aerotropolis sits in multiple jurisdictions, and to implement this ambitious plan cooperation among multiple jurisdictions is essential. The mass transit promotion in all these jurisdictions will physically connect them and investing in mass transit will create more opportunities for employment through availability and accessibility. The American public transport association in their report on the Economic Impact of Public Transportation Investment in 2020 found, “the Increased investment in public transportation can lead to significant economic growth because of both the short-term stimulus impact of public transportation outlays and a longer-term, cumulative impact on economic productivity”. As per the report, approximately 20,000 jobs are supported for a year per one billion dollars of annual spending on public transportation operations in the United States. The aerotropolis Atlanta blueprint, mentions about well-planned and well-functional transportation networks that will lead to catalytic area improvement. In this regard they have tried to leverage from the various transportation planning efforts of South Fulton comprehensive transportation plan, the clayton country comprehensive transportation plan, the connect Atlanta plan, Marta clayton extension and many others. After analyzing the ground situation, it has been increasingly felt there is more work to be done in this section as it was found after carefully analyzing the data there is a still a large population living in the neighborhood with a poor commuting service and
they lack an extensive public transportation infrastructure and there should be an increasing footprint of mass transit infrastructure and strategies in their upcoming blueprint 2.0.

C. Improving and upgrading the infrastructure of Airport City.

The easiest way to attract new residents, new employees, new employers, and new businesses is to reinvest in the city infrastructure, the infrastructure of transport, health, education, parks, open spaces as well as other public services. Location is an essential component of business, and so is the quality of working or living in that environment. The improvement should be done considering the spillover of international travelers to an airport city. The empirical studies show the relationship between enhanced airport services and infrastructure with international tourism flows (Khadaroo and Seetanah, 2007). The relationships are also seen in the regional economic development and the augmented infrastructure of the airport city (Halpern and Bråthen, 2011). There is no specific mention of the improvement and upgradation of city infrastructure other than mentioning of catalytic areas, the focus in the new blueprint should be upgradation of specific infrastructure in order to measure the impact and success of the development.

D. Competitiveness in Cargo Industry

Since Atlanta is one of the busiest airports around the world and sits at a very crucial location, with Savannah being just four hours away - the nation’s fastest port. Atlanta can use this leverage to become the center of air cargo distribution for the south. The simple formula is to combine and integrate air, rail, trucking, and marine-the various sectors of the cargo transportation industry and center them around the aerotropolis. The connecting network should be distinct and on the modern lines of technology for custom clearances and security checks and a provision of customized service should also be available for major shippers. D Kasarda (2000), quoting Toffler says, “As a futurist, Alvin Toffler predicted more than a decade ago that one indisputable law would determine competitive success by the beginning of the 21st century: survival of the fastest. The commercial success In Toffler's view, speed and agility would take center stage as against producing high-quality goods at competitive prices.” Additionally, the
marketing and branding which is also an essential component of cargo industry is missing in the previous blueprint, the only mention of branding and marketing is of Atlanta aerotropolis in general by using consistent messaging, and advertising via social media campaigns. I would suggest the branding should start from rebranding the reputation first, Atlanta airport has a reputation of being noisy and unattractive airport area for investing. The new blueprint should specifically start with positive rebranding of Atlanta airport and then further dive into the marketing and branding of cargo industry.

E. Create more Anchor Institutes

Concepted in 1960, the anchor institutes are large place-based establishments like universities, hospitals, etc., they arose primarily in urban areas, accepting more direct responsibility for confronting social issues of the neighborhood. These institutions invest in their communities as a way of doing business, but many reputed anchors may be unable or unwilling to play these functions due to competitive rivalries, or commercial pressures. To benefit from already existing establishments, the aerotropolis development should prioritize the companies that benefit from the proximity of the airport. This prioritization can induce the impact of agglomeration and create more economic benefits for the aerotropolis. Here are a few observed principles that help the anchors to thrive:

1. Build mutually beneficial agreements.
2. Contain expectations and focus on lasting relationships.
3. Create a shared precinct identity and purpose.

For Atlanta aerotropolis Georgia Institute of Technology, Georgia State University, and Emory University could be leading anchors. Quoting from the works of Perry and Wiewal (2005), “The Atlanta University Consortium (Morehouse, Spelman, Morris Brown colleges, and Clark Atlanta University) is strengthening the institutions and the deteriorated neighborhoods in which they are located, and the city has already seen success with university-driven downtown and neighborhood revitalization through the work of Georgia State University and Georgia Tech”.
14. Conclusion

This paper has looked at Hartsfield Jackson Airport and its environment in terms of its development directly impacted by the idea of the aerotropolis. Hartsfield Jackson Airport, Atlanta is among the busiest airports around the globe and has significant potential to make a lasting impression on the areas around it and change the region for its inhabitants. However, as I realized in the process the Atlanta aerotropolis is still in its infancy, it will require some time before it could reach the goals it has set through aerotropolis strategies and planning. The marketing and brand name of Atlanta aerotropolis needs more cooperation from all the stakeholders from the Atlanta region. In addition to that the community around the aerotropolis boundary are equally important, ensuring their high quality of living will contribute to the success of Atlanta aerotropolis which will eventually benefit the local and regional economies. Although the challenges are multifaceted and complex, there is hope in this new form of the urban realm, it would make things more participatory, inclusive, and diverse. More importantly, it will also make the governance structure more efficient and transparent along with the sustainable using resources and caring for the planet.
15. References


