



Memphis: America's Aerotropolis™

Executive Summary
2009



Memphis: America's Aerotropolis™
Where Runway, Road, Rail & River Merge™

Memphis has always relied on its logistical capabilities and the access it provides to the world. Taking it to the next level requires the support of public, private and civic leadership.

The following executive summary includes recommendations about how to do that.

In late 2006, community leaders began a dialogue with Dr. John Kasarda, Director of the Kenan Institute of Private Enterprise at the University of North Carolina in Chapel Hill. Through Dr. Kasarda's studies, the Memphis Region was identified as being the best example of an "aerotropolis," a term he coined to mean a new type of urban form combining aviation-intensive businesses and related enterprises extending up to 25 kilometers outward from mega airports.

Memphis International Airport is the largest economic generator in Memphis and Shelby County and in the entire region. While the airport continues to grow and flourish – both in air cargo and passenger – this plan supports the revitalization of the area surrounding the airport.

Through the work of Dr. Kasarda and local leaders, we have documented opportunities for growth and economic development in Memphis: America's Aerotropolis. The following summary is a roadmap to fully leverage the airport and the area around it to benefit the community.

Memphis, Tennessee, is America's Aerotropolis.



Tom Schmitt
2009 Chairman
Greater Memphis Chamber



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Memphis: America's Aerotropolis

Case and Context for Memphis Aerotropolis

I. Introduction



Memphis has rightfully branded itself as “America’s Distribution Center.” From its antebellum leadership, consolidating and distributing cotton and lumber to the nation and the world, through its twenty-first century position as the globe’s largest, fastest, and most connected multimodal logistics complex, Memphis and distribution have been synonymous. Yes, its rich heritage in music and food, along with other cultural amenities, have made Memphis famous world-wide, attracting millions of tourists annually, but its economic backbone has been and continues to be distribution.

The arrival and dramatic growth of FedEx at Memphis-Shelby County International Airport (MEM) during the last quarter of the twentieth century positioned air logistics and supporting ground services as the primary economic engine of the region, and attracted time-critical industries of all types. In 2007, the airport handled 3.7 million metric tons of cargo, 94 percent due to FedEx, which processed over 2 million packages per night, on average. With approximately 300 daily national and international cargo flights, the hub covers the globe. This air connectivity is further enhanced by superior interstate highway and rail access, as well as by excellent airline passenger service. The Delta Airlines hub at MEM offers 285 daily scheduled departures to 101 U.S. cities and to Amsterdam.

Largely a result of the FedEx presence, the economic impact of Memphis International Airport is immense. According to a 2005 study by the University of Memphis, the airport had a \$22 billion impact on the metropolitan economy, \$19.5 billion resulting from air cargo activities. A total of 166,000 jobs in the metro area are tied to the airport (30,000 employed by FedEx alone) which constitutes over one in four jobs in the Memphis Metropolitan Area. Almost half of the businesses in the area feel that their economic future is linked to the airport.



“In 2007, the airport handled 3.7 million metric tons of cargo, 94 percent due to FedEx, which processed over 2 million packages per night, on average.”

With more and more businesses being attracted to the Memphis airport area and along its main transportation corridors, a new urban form has emerged — an Aerotropolis — stretching 20 to 30 miles outward from the airport center. A 2006 article in *Fast Company* magazine stated that Memphis is the best example of an Aerotropolis in America today.

To date, however, Memphis Aerotropolis development has occurred largely in a spontaneous, haphazard and, in some areas, unsightly manner that detracts from its economic efficiency, aesthetic appeal, and social and environmental sustainability. Memphis business and public leadership have thus formed a steering committee not only to capitalize on the region's aviation and other logistics assets, but also to address current airport area issues, and the social and physical infrastructure gaps in the region that limit the Aerotropolis effectiveness and growth potential. Memphis' objective is to be America's preeminent Aerotropolis, and one that continues to lead the world in airport-driven, innovative economic development.

Aerotropolis

/,ar-ö-'tra-pə-ləs\ n, a new type of urban form comprising aviation intensive businesses and related enterprises extending up to 25 kilometers (15.5 miles) outward from major airports.

"A 2006 article in *Fast Company* magazine stated that the closest airport region to an Aerotropolis in America today is Memphis."

II. Air Passenger Service: An Important Component

“As the world’s service economy also becomes time-critical, airports are also becoming magnets for regional corporate headquarters, trade representative offices, specialized producer services, and professional associations that require executives and staff to undertake frequent long-distance travel.”

Memphis has clearly demonstrated how time sensitive goods-processing and distribution facilities are being drawn to locations near major airports. Yet, as the world’s service economy also becomes time critical, airports are also becoming magnets for regional corporate headquarters, trade representative offices, specialized producer services, and professional associations that require executives and staff to undertake frequent long distance travel. This has been particularly the case at airline hubs which offer greater choice of flights and destinations, more frequent service, and more flexibility in rescheduling.

A diversified air service likewise makes the airport operations more cost competitive for both passengers and cargo, and supports diversified economic development opportunities. Combined cargo and passenger operations, which tend to concentrate their operations in different times of the day, are a more effective use of costly airport infrastructure. Thus, passenger and cargo traffic complement each other in driving development.



III. Regional Economic Impacts

Numerous studies have documented the huge impact that airports have on their regional economies. Just to summarize a few highlights:

[Los Angeles International Airport \(LAX\)](#), for example, is responsible for over 400,000 jobs in the five-county Los Angeles region. 80 percent of those jobs are in L.A. County, where 1 in 20 jobs was found to be tied to LAX. The airport generates \$61 billion in regional economic activity, which translates to \$7 million per hour.

In the 26-mile commercial corridor linking Washington, D.C.'s two major airports — [Reagan National and Dulles International](#) — employment grew from 50,000 in 1970 to nearly 1 million by 2006. Among the companies located along the airport corridor near Dulles are America Online, Computer Associates, Nextel Communications, Cisco Systems, and EDS. So substantial has development been around the airport corridor that the metropolitan Washington Airport Authority recently purchased 400 acres outside the fence for joint development with a private master developer.

[Ontario California International Airport](#), which is the west coast regional air express hub for UPS, and in which FedEx has a strong presence, has been the engine of major growth in Southern California's Inland Empire. Over 10 million square feet of logistics and distribution space have been added annually around the airport and along nearby I-10 and I-50 Interstates.

The impact of airport-induced job growth on land use in the vicinity of airports is likewise substantial. Areas within six miles of airports are adding jobs much faster than the overall job growth rate of the suburban ring within which the airport is located. While most of the employment is concentrated near the airport or along major connecting highways within 15 to 20 minutes of the airport, effects can be felt up to 60 miles from airports with air connections. This significantly increases a region's access to suppliers, markets, ideas and capital.



“Areas within six miles of airports are adding jobs much faster than the overall job growth rate of the suburban ring within which the airport is located.”

IV. The Evolving Aerotropolis

Emerging corridors, clusters, and spines of aviation-linked businesses are giving rise to a new urban form: the Aerotropolis - an airport-integrated economic region. The airport functions as a multi-modal transportation hub and commercial nexus of this diffuse urban region, analogous to the function central business districts (CBDs) play in the traditional metropolis. Indeed, some of these airports have assumed the roles of metropolitan CBDs by becoming regional intermodal surface transportation nodes and significant employment, shopping, meeting and entertainment destinations in their own right.

Although most Aerotropolises have so far evolved largely in an uncoordinated manner, with insufficient transportation infrastructure or previous nearby development that often creates arterial bottlenecks, future development may be improved through strategic infrastructure planning. Seamlessly connected multi-modal infrastructure will accelerate transfers of goods and people, improving transport system effectiveness and further influencing land values, business development, and the resulting urban form. While such infrastructure development at and around MEM is years away, the roadway and especially the commuter transit planning process needs to begin immediately, appropriate land must be reserved before ongoing property development precludes such critical future infrastructure.

Those in the air express and air cargo industries know that the battle for air freight is won on the ground — not the air — with good highway connections a key factor. This is why most of the leading air express and air cargo airports also have excellent expressway links and on-site or nearby truck cross-docking facilities. These highway/air cargo synergies are often reinforced by excellent nearby intermodal rail facilities and sometimes by good waterborne movements, making a handful of airport regions like, Hong Kong, Korea's Incheon, and Memphis' quadramodal (air, highway, rail, and water transit), in their industries.

Quadramodal Logistics

/kwä-drä-'mōd-əl adj: the procurement, maintenance and transportation of material involving four modes of transportation - ground, air, rail & water.



Selected Aerotropolises in Evolution

Dallas–Fort Worth (DFW) includes 18,000 acres, covering parts of four cities and two counties. In 2006, its regional economic impact was estimated to be \$19 billion dollars. The airport has been a major factor in attracting nearly 24 *Fortune* 500 corporate headquarters to the broader airport region, including three major *Fortune* 500 headquarters to Las Colinas, just east of DFW. This 12,000-acre, airport-linked community has 22.3 million sq. ft. of Class A office space, 8.5 million sq. ft. of light industry, 1.3 million sq. ft. of retail, over 14,000 single-and multi-family residences, 3,800 luxury and business-class hotel rooms, 75 restaurants, and 2 championship golf courses.

Denver International Airport (DIA), the nation's newest major airport, opened in 1995 and covers 34,000 acres (53 square miles) making it the third most spacious in the world. The objective of its planners from the start was to have DIA drive economic development throughout the vast surrounding airport area and be a major factor in revitalizing downtown Denver (24 miles to the southwest). The broad airport area is already the home to over 300,000 residents and 184,000 workers. The 300 square mile DIA area is forecasted to grow at a rate at least double that of the overall metropolitan area, with a forecasted population of 558,000 in 2025 and a total employment base of 427,000.

Detroit Metro Airport (DTW), the 11th busiest airport in the U.S. in terms of takeoffs and landings and the 15th busiest airport in the world, serves 145 nonstop destinations in the U.S., Europe, Asia, and Latin America. DTW and Willow Run Airport, seven miles away on I-94, are the key assets in the region's efforts to rebuild its economy and overcome the likely continuing decline in its automotive manufacturing sector and other traditional industries. A public-private leadership group was formed to leverage the two airports and the 25,000 acres of undeveloped land along the corridor connecting them to attract new industry and to serve as a nucleus of renewed regional economic development.



Denver International Airport



Asia's Airport Cities and Aerotropolises



Hong Kong International Airport (HKIA)



Hong Kong International Airport's (HKIA) 1,258-hectare (2,700-acre) site was created by leveling two small islands and reclaiming land from the sea. The airport opened in 1998 with a total project cost of \$20 billion, including a 26-mile, multi-lane expressway and modern airport express train to both Kowloon and Hong Kong Island. The airport is connected by high-speed turbo jet ferries to the Pearl River Delta. Three airport commercial districts are well along in development: the 70-acre South Commercial District for logistics; the 52-acre East Commercial District for offices; and SkyCity, the 125-acre commercial development adjacent to the passenger terminal.

Incheon International Airport, opened in 2001 on 15,000 acres 42 miles south of Seoul, is the core of dual urban growth poles. Yeongjong Island houses Air City, with aviation-oriented office functions, hotel, trade and exhibition facilities, logistics, and tourism and leisure activities. Songdo Island will host the 1,500-acre New Songdo City. This \$20+ billion project is the largest private development project currently underway in the world. By 2016, 15 million square feet of office and commercial space, more than 9,000 residences, a convention center, a cultural center, a central park greenway, an 18-hole golf course, and a state-of-the-art medical facility will have been built.

Singapore Changi International Airport, 16 miles from downtown Singapore, has been considered among the most efficient and aesthetically pleasing airports in the world. The opening of its swank Terminal 2 in 1991, ten years after the airport was established, positioned Changi as an Asian leader in infusing passenger facilities with modern retail and service functions. A third luxury terminal, costing \$1.8 billion, is now open. In 2001, Civil Aviation Authority of Singapore created a 60-acre Free Trade Zone at the airport to house value-added third-party logistics providers, firms involved in assembling high-tech products, and e-commerce fulfillment.

European Airport City and Aerotropolis Experiences

Amsterdam Schiphol employs 62,000 people within the fence. Schiphol's passenger terminal incorporates modern retail plaza design elements and contains expansive, well-appointed shopping and entertainment arcades accessible both to travelers and the general public. The 4 million sq. ft. World Trade Center with meeting facilities and office space is directly connected to the passenger terminal. Space for cargo distribution, office parks, and time-sensitive light industry is along the periphery of the airport. Amsterdam's "edge city," Zuidas, which contains over 10 million sq. ft. of Class A office space, is just six minutes away by expressway or train.

Frankfurt International Airport (Fraport) is the most international hub in the world, with 125 different scheduled airlines flying to 307 destinations in 112 countries. Every single day the airport handles over 140,000 passengers (54 percent of whom are transfers); 40,000 meeters and greeters; 6,000 metric tones of cargo; 1,300 aircraft, and 380 terminal-linked passenger trains (both short and long distance). Frankfurt Airport Centers 1 and 2 have one-million-plus sq. ft. complexes containing offices, banks, a 1,008-room Sheraton convention hotel with a 1,400-person congress center; they are less than a five-minute walk from the airport's terminals and the rail station.

Dubai International Airport (DXB) Recognizing that Dubai's position halfway between Asia and Europe could make it an important transit point for passenger and cargo traffic, a decision was made in the mid-1980s to liberalize air cargo and passenger access for development purposes. This put air cargo at Dubai International Airport on a rapid trajectory. In 2007, the airport handled 1.7 million tons of cargo, up from 940,000 tons in 2003, and 420,000 tons in 1998. With cargo growth at the airport continuing at a breakneck pace, new facilities have followed suit. The first phase of a Mega Cargo Terminal, with annual capacity in 2018 expected to be 5 million tons, has been completed, along with a state-of-the-art fresh flower facility.



Amsterdam Schiphol



Frankfurt International Airport (Fraport)



V. Memphis' World-Class Aerotropolis Potential

“Much of the Memphis Aerotropolis developed in a period in which few people could envision the new role of airports in the global economy.”



[In Good Company.]

COMPANY	EMPLOYEES	SQ. FEET
Technicolor Video	2,800	3,637,000
Williams-Sonoma	1,000	5,200,000
Hewlett-Packard	200	2,700,000
Nike	1,469	2,700,000
Brother International	910	1,500,000
Ford Motor Co.	220	1,069,836
Cleo	1,000	957,016
Pfizer	230	400,000

MAJOR MEMPHIS DISTRIBUTION OPERATIONS BY WAREHOUSE SQ. FT.

**2008 Book of List, Memphis Business Journal*

Few places in the world can lay claim to being both a leading air cargo/air express hub and a major passenger airline hub. Combine these with Memphis' existing interstates and two new interstates under various stages of construction, its five Class I railroads, and the fourth largest inland water port in the U.S., and Memphis is a quadramodal logistics dynamo. No surprise, then, that Memphis has the highest share of logistics workforce in the nation (18 percent including wholesale), and these numbers have been growing. For example, between 2005 and 2007 Memphis added 37,325 logistics jobs, \$3.4 billion in new logistics investment, 164 relocated logistics companies, and 255 expansions of existing logistics companies.

It is Memphis' aviation assets, though, especially its FedEx world hub, that make possible long-distance fast-cycle logistics — the lifeblood of high-tech firms, be they microelectronics or biosciences. It is also an aviation network that will become more critical for Memphis tourism (especially when the Indian and Chinese tourist tsunami likely hits in a decade or so), and for Memphis enterprise networks that require the region's corporate managers and professionals to be even more connected to the nation and the world.

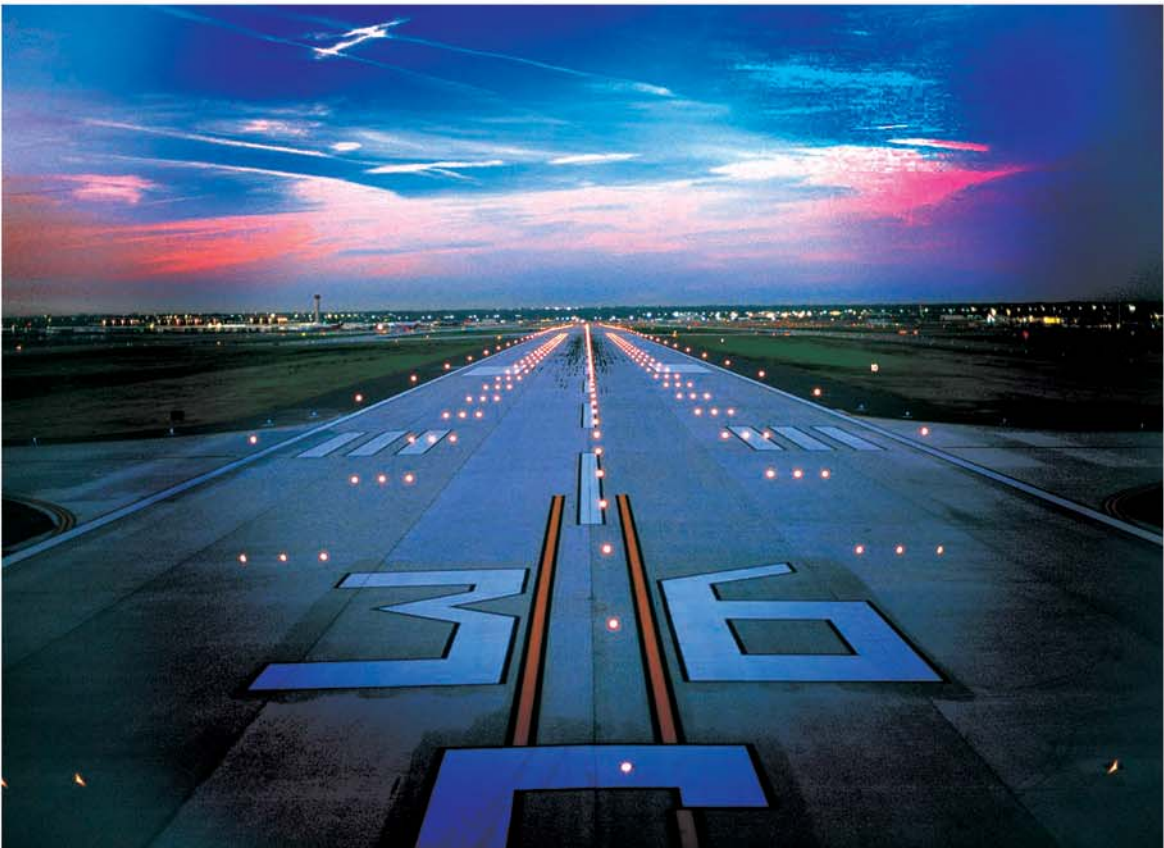
The Aerotropolis is the physical and spatial manifestation of these tourist, supply-chain, and corporate enterprise networks. Memphis, then, has every opportunity to bolster existing and add new clusters of medical and bioscience facilities; corporate offices; microelectronics, information and communication technology firms; tourist and entertainment venues; hotels; exhibition, trade and wholesale merchandise marts — essentially everything in the commercial clusters of the Asian and European airport regions which characterize world-class Airport Cities and Aerotropolises in evolution. All of their commercial components are transferable in some manner and form to Memphis, so that the Memphis region can rightfully lay claim to being America's first and preeminent Aerotropolis.

Being the first has its costs, however. Much of the Memphis Aerotropolis developed in a period in which few could envision the new role of airports in the global economy, or the current volume of passenger and cargo air traffic now common, much less that forecasted. As a consequence, Memphis' transportation infrastructure has developed somewhat haphazardly and is now showing strain. Likewise, much of its commercial development in the airport area is strip rather than cluster centers, with numerous facilities that have little to do with the airport mixed with those that are airport-linked. The result is sometimes unsightly economic inefficiencies and diminished growth prospects.

With the recent and planned upgrades on the airport grounds itself, attention is being directed towards a renewal in the immediate surrounding area — the "Airport City" district. The most apparent upgrades are aesthetically improving the air travel gateway to the city and region so that visiting business people and tourists feel comfortable, welcome, and excited. In addition to these improvements there is a need for a fundamental assessment of the city's and region's transportation infrastructure gaps. Visitors and residents, as well as goods-moving vehicles, need to know "where they are" and need to be able to move quickly to their destinations. Land use, transportation, and information exchange need to be streamlined. Such interventions will be required throughout the greater aerotropolis region if the City of Memphis, Shelby County, and outlying reaches are to continue to capture the full potential of the region's air, ground, rail, and water connectivity. Memphis has the fastest, most agile and arguably most connected airport on the globe, but it needs to be further improved and leveraged to attract tourists, quality businesses and good-paying jobs of all types, not only to the immediate airport area but also throughout the entire Memphis region.

"Memphis has the fastest, most agile and arguably the most connected airport on the globe."





“...the Memphis region can rightfully lay claim to being America’s first and preeminent Aerotropolis.”

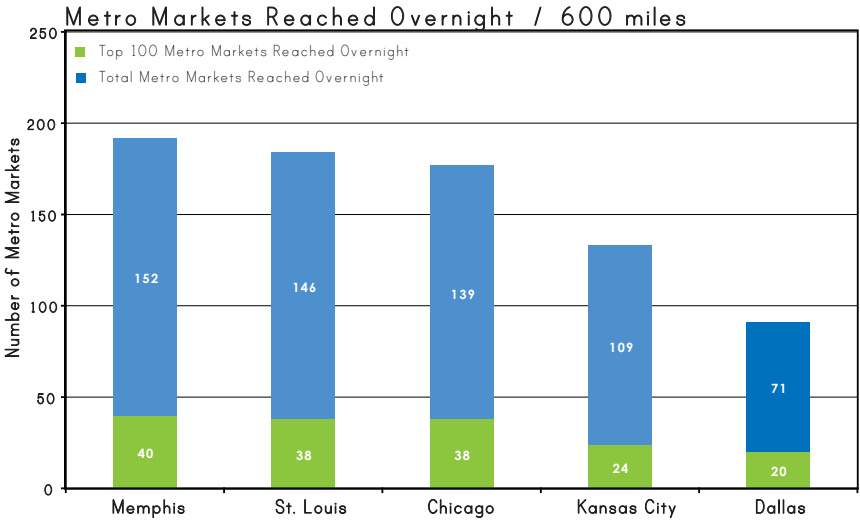
Memphis: America's Aerotropolis

Infrastructure, Facilities and Economy

I. Memphis Location and Surface Infrastructure

“Memphis is pivotally positioned in the national highway network and in the nation’s highway freight corridors.”

Memphis is centrally located on the inland waterway system, 640 river miles north of New Orleans and 400 miles south of St. Louis. It possesses the fourth largest inland water port in the U.S. Memphis is also central in the national rail network. The metropolitan area is served by five Class I railroads. Over 200 trains per day travel through Memphis — about one every six and a half minutes. Given its position in the waterways and railroad systems, Memphis is pivotally positioned in the national highway network and in the nation’s highway freight corridors. Memphis is located at the intersection of Interstate 40 and Interstate 55, which both cross the Mississippi River at the city. When completed, Memphis will also be centrally located on the Interstate 69 NAFTA highway, likely strengthening the area’s position as a logistics center. Interstate 22 from Memphis to Birmingham is funded and portions are currently under construction. This will provide yet another direct connection to major east coast markets.

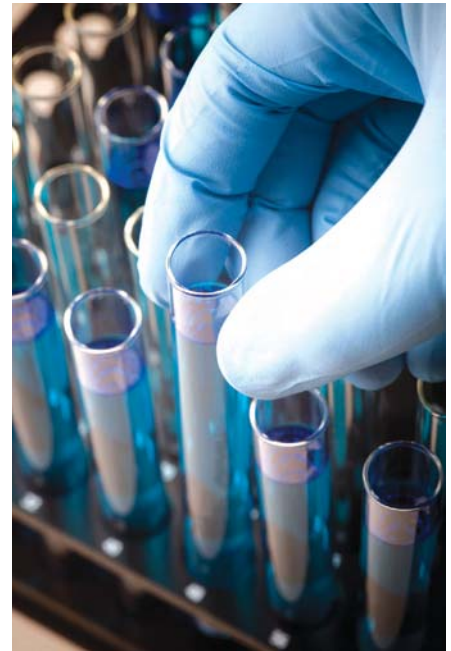


II. Strengthening the Economic Bases of the Aerotropolis

The Memphis Aerotropolis is built on three main economic pillars. Logistics is easily the largest and is Memphis' major claim to prominence. Memphis owes its reputation as America's Distribution Center to its geographic location and to the firms that were able to perceive the need for national supply and distribution networks, and then to use the city's geographical advantages and logistics support services to fill that need.

Tourism is an important component of the regional economy. Memphis is the home of the Blues, the birthplace of rock and roll, the site of Graceland, and the gateway to Tunica Resorts. The Beale Street Historic District is the most visited attraction in Tennessee, with more than 4.2 million visitors per year. The Beale Street area and larger portions of downtown have become the entertainment district for the Memphis metropolitan area, attracting many local residents for a night or afternoon out and demonstrating the cross-subsidization between tourism and quality of life. Time Life Books recently named Memphis one of the "World's Top 100 Dream Destinations", no surprise when you consider that Memphis boasts more than fifty ticketed tourist attractions, including one of the nation's best zoos, recently ranked #1 in the country by TripAdvisor, a Web site (TripAdvisor.com) that features travel-related reviews from regular citizens.

Medical and health services have been a component of Memphis' economy for decades. Bioscience is a new, rapidly growing sector. Three points stand out. First, employment in the Memphis area biotechnology sector is still significantly smaller than that of the other major concentrations. Second, the Memphis area technology sector employment is growing quickly. Third, Memphis' technology sector employment growth is largely in the development and production-oriented "mid-tech" sub-sector. New industries are developing within the bioscience sector that hold immense potential for Memphis should they be nurtured and leveraged.

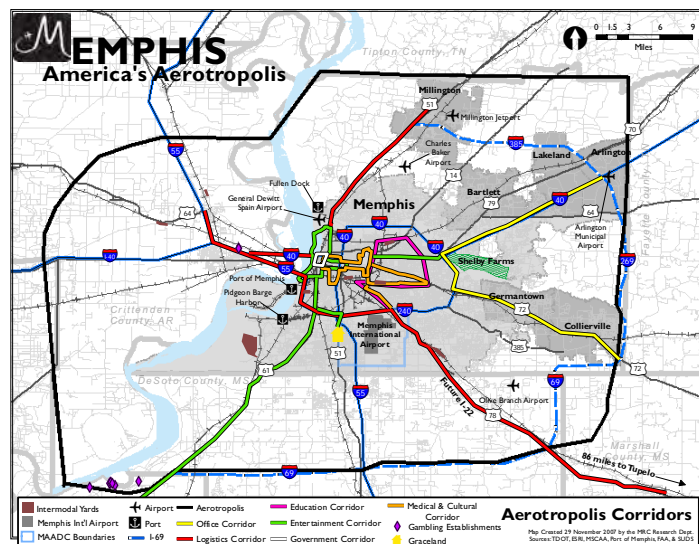


“The region can emerge as a major global multi-modal hub if infrastructure is in place for markedly improved air-ground (road and rail) and, less immediately, river multi-modal operations.”

Airport-linked development is a strong point in Memphis regional development. Yet, while Memphis is the busiest air cargo airport in the world, it faces present and potential competition, as air cargo hubs from several other mid-continent airports that have grown largely on the basis of national distribution systems. The competitive environment implies a need for further investment to remain pre-eminent, but it also may limit the positive effect of infrastructure improvements.

Memphis’ position as a global air cargo hub will no doubt be affected by the continuing rise of trade with Asia. The region can emerge as a major global multi-modal hub if infrastructure is in place for markedly improved air-ground (road and rail) and, less immediately, river multi-modal operations. Such investments will allow an optimal mode mix as increasing concerns about the environment, rising fuel costs, growing congestion in the air and on the roads, and evolving supply and distribution needs influence transportation choices.

The Memphis Aerotropolis has a vibrant but not particularly large passenger hub. Memphis is the 21st busiest passenger airport in the U.S., and third largest domestic hub for former Northwest Airlines. Growing the MEM passenger hub will most likely require growing Memphis as an origin destination passenger market. The short and medium term prospects for doing so are moderate, but the long term growth prospects are reasonably good, if Memphis plans systematically and implements effectively. Nevertheless, through important air connectivity will be critical it is only part of Memphis’ attraction.



III. Memphis Aerotropolis Infrastructure Needs

Intermodal connectivity provides the “joints” of the regional infrastructure skeleton and needs to operate smoothly. The ground access issues for cargo and passengers are somewhat different, but both are important. Local planners have identified congested points in the region’s roadways that require attention, but limited congestion is not sufficient to minimize access travel time or emissions. As a logistics dependent region that is an EPA non-attainment zone, Memphis needs to be greener as well as faster.

With respect to passenger access, the first issue to consider are the origins and destinations of air passenger and employee ground trips. Given the dispersed locations of many of the potential destinations for visiting air travelers and the potential destinations for employees and local air travelers, any airport access system will need to serve a large area. In order to succeed, public transit should provide frequent, fast service to and from the most popular regional destinations at a competitive price. Airport access public transit appears to function most successfully when air travelers and workplace commuters cross-subsidize each other. Further study of urban transit options is warranted. Corridors for future fixed guideways should be reserved in any case.

The rationalization and growth of Memphis’ port and rail infrastructure is well underway with the development of the harbor and intermodal rail yard southwest of downtown. These should increase the efficiency of intermodal transfers, offer aligned industry attractive sites, and reduce the level of unnecessary local movement, trimming costs and minimizing the local environmental footprint.

There is a need to improve air-ground cargo transfers. Immediate airport area cargo access is mainly along local streets with frequent intersections. Moreover, access to many warehouses and distribution centers is via local feeder roads. The more detailed regional infrastructure strategic plan now being conducted by Global Insight will address how access can be smoothed and unnecessary stops that increase time, fuel use, and pollution can be eliminated.

“As a logistics dependent region that is an EPA non-attainment zone, Memphis needs to be greener as well as faster.”



"The airport is a factor determining land use patterns in Memphis to a degree that is not often recognized, let alone leveraged."



Electronic data interchange for intermodal cargo provides the virtual equivalent of "tendons" in the infrastructural skeleton. To support 21st century business practices of electronic commerce, just-in-time delivery, and supply chain management, electronic data interchange must be provided as a tool for air logistics hub operators, tenants, logistics service providers, and U.S. Customs. The future air logistics hub EDI system will be a network of computers and databases that provide an interface between all parties involved in arranging a shipment. This EDI system must be capable of interfacing with multimodal carrier systems to provide online tracking and tracing capability for the shipper across modes. A key function of this system should be to interface with U.S. Customs. The local air logistics hub EDI network should also have access to global telecommunications networks via satellite transmission.

The region needs to carefully consider airport area land use and facility needs. As a busy, maturing airport, MEM is beginning to face space constraints. Should current growth trends continue, MEM may need to acquire additional property outside the fence or make contingency plans for efficiently relocating some airport functions off-site. The airport is a factor determining land use patterns in Memphis to a degree that is not often recognized, let alone leveraged. The airport area is a focus zone and point of reference for metropolitan activities and employment. A broad logistics zone is now completing its circle around the airport throughout DeSoto County.

The internal spatial structure of that zone, however, is not well organized. Industrial parcels are interspersed with residential areas. Homes are sometimes located under busy flight paths while industrial areas are located in the less noisy zones. A systematic rationalization of airport area land to focus more heavily on airport-related business activities, relocating residences away from the industrial uses, should improve the airport area's attraction. The airport hotel cluster might be redeveloped to provide more high end services needed by business travelers and the amenities desired by recreational travelers. Land being used in a manner inconsistent with airport leveraging could be acquired and banked for conversion to airport-linked industrial, logistics, and other commercial uses.

Memphis: America's Aerotropolis

Memphis Aerotropolis Business Plan Guidelines

I. Business Resource Needs

“Now Memphis faces the challenge of building upon its logistics leadership, renewing its infrastructure, and rationalizing its land use patterns so as to become more economically efficient, aesthetically pleasing, and socially and environmentally sustainable.”

Connectivity, speed, and agility have become the 21st century formula for commercial success. Memphis, through its FedEx cargo hub and the Delta passenger hub, has created and benefited immensely from these factors. Now Memphis faces the challenge of building upon its logistics leadership, renewing its infrastructure, and rationalizing its land use patterns to become more economically efficient, aesthetically pleasing, and socially and environmentally sustainable.

This will require more effectively integrating multi-modal surface transportation with air movements and providing the advanced telecommunications network to provide all regional firms with the ability to trace, track, and manage product movements and inventory. Business resource needs also include additional foreign trade zones (especially at and near MEM) and one-stop government service centers (combining Federal, State, and local agency requirements) to expeditiously provide investors with all necessary licenses, permits, and investment promotion privileges. Accelerated site approval zoning rationalization and construction permitting would also be of considerable value. Finally, in addition to logistics education and training provided by local colleges and universities, a distance education center tied to local educational institutions and local firms could provide real-time audio, video, and tactile worker training onsite from training centers in distant locations.

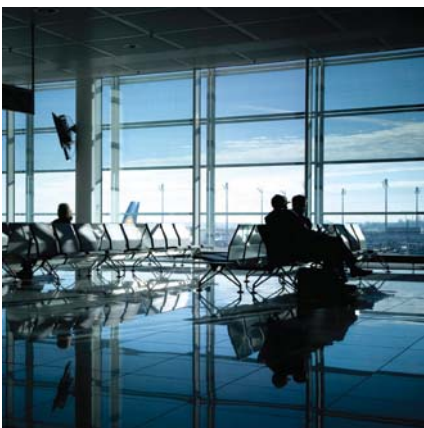
II. Seven Critical Success Factors for Aerotropolis Planning and Development

1. The Memphis Aerotropolis must be designed around emerging twenty-first-century business practices.
2. Development plans for the Memphis Aerotropolis must give high priority to quality of life considerations, economic efficiency, and sustainability.
3. Master plans for the Memphis Aerotropolis must be flexible and reconfigurable.
4. The Memphis Aerotropolis must establish synchrony with other infrastructure projects around the country and the world.
5. The Memphis Aerotropolis must emphasize the importance of logistics-based capabilities in assisting, supporting, and attracting globally-oriented businesses.
6. Development planning should focus on the aesthetic and social climate in the immediate airport area.
7. Master plans must demonstrate regional benefits of the Memphis Aerotropolis.



III. Expanding the Business Impact of Air Passenger Service

Memphis is well-served by its Delta Airlines passenger hub, providing excellent connectivity to all major markets throughout the United States. It is absolutely essential for Memphis' business competitiveness and future prosperity that the hub be maintained. Indeed, to the extent feasible, the Memphis hub should be enhanced, particularly with additional flight frequencies to markets which contain major clusters of industries that Memphis wishes to bolster in its own future. For example, in the biosciences sector, additional frequencies to hubs such as Boston, Philadelphia, Raleigh-Durham, and San Diego could prove valuable stimuli to movement of business professionals and executives to and from Memphis. Places like Shannon, Ireland, are subsidizing airlines to provide more frequent service to targeted markets in the U.S. and Europe as they seek to bolster their own high-tech development. Memphis is also served by an international non-stop KLM flight to Amsterdam. This flight has proven to be a success. Greater international passenger connectivity should be pursued vigorously since the economic payoff to the Memphis region could be immense.



Memphis: America's Aerotropolis

Guidelines and Recommendations for a
Memphis Aerotropolis Implementation Plan

Strategic Recommendations

1. The connectivity, speed, and agility of the Memphis Aerotropolis need to be maximized in order to build competitive advantage.
2. Memphis must further improve its fast-cycle logistics environment to build its brand as “America’s Aerotropolis” and keep pace with expected industry growth.
3. Effective marketing must build on the confluence of location, excellent Interstate highways, MEM, FedEx, and other time-critical logistics service providers, which offer the Memphis region competitive capabilities and make it the fastest and most agile location in the U.S. to conduct business.
4. The Memphis International Airport passenger hub must also be maintained and should be expanded, even if this requires creative subsidies for expansion.
5. Enhancing the level of airport service, addressing space shortages within the fence, and facilitating ground access are important strategic competitive improvements.
6. Memphis city leaders must realize that MEM area development will complement and reinforce downtown revitalization over time, making both areas more successful.



Land-Use Recommendations

7. The airport area's appearance and functionality must be improved by upgrading the surroundings to become clustered commercial campuses with logistics, manufacturing, and cargo handling physically separated from flows of business and leisure travelers.

8. Elected officials and planners of areas around MEM have a long term fiduciary responsibility to prevent the encroachment of non-compatible land uses that can limit future airport expansion and thereby threaten the increasing positive future impact that MEM can have on the entire three-state Region.

9. Airport area zoning should encourage the location of airport-oriented businesses and industries near MEM, while addressing aesthetic and social problem issues.

10. The airport area needs to plan for the additional close-in core logistics space by banking expansion land for airside expansion and critical logistics activities.

11. Airport area hotels should be consolidated into cohesive zones with ready access to adjacent entertainment areas and acceptable forms of transit.



Multi-modal and Ground Transportation Recommendations

12. State-of-the-art broadband, fiber optics, Wi-Fi, and satellite links are needed for the Region's companies to trace, track, and control product movements, which in the future will increasingly be monitored and managed through RFID (radio frequency identification), GPS (Global Positioning System), and intelligent software agents (via computer chips embedded in products, parcels, and containers).

13. Improvements need to be made in the Region's highway system, including the construction of the I-69 NAFTA Highway, another seismically designed bridge over the Mississippi River, the continued upgrading of U.S. 78 / I-22, and the rationalizing of local truck and intermodal traffic flows, that require new, planned, highway interchanges.

14. A cargo transfer system should be considered to eventually link the FedEx hub and the cargo-related businesses throughout the Airport Area, as well as to intermodal rail facilities.

15. Airport connectivity through a system of mini-buses or shared vans may be the most appropriate public transit serving travelers and commuters for the immediate future, though land-banking for possible longer-term commuter rail to the airport also warrants consideration. The new MATA Terminal offers a potential ground passenger hub.

16. Because "image-making" is also a pivotal Aerotropolis marketing strategy, all MEM gateway entrances should receive special emphasis in design, connectivity, and image appearance, with high quality design standards including lighting, signage, planting, and material selections.



Governance Recommendations

17. Local governments must work together as a single entity, reflecting the fact that the Aerotropolis is a single integrated market economy, in order to prevent companies that desire to locate in the Memphis Aerotropolis from playing jurisdictions off one another to the detriment of their tax bases and their residents.

18. Memphis' Aerotropolis Steering Committee, the Memphis-Shelby County Airport Authority, the Greater Memphis Chamber and other economic development organizations in the city and region should closely consider the airport area governance models employed in the Denver and Amsterdam regions.

19. Aerotropolis area government officials and their planners should conduct periodic working sessions to explore how their specific jurisdictions could encourage more effective place marketing, address airport-induced problems, and realize more beneficial development outcomes.

20. Consideration should be given to establishing a task force within the Memphis MPO to focus on priorities in the broader airport area, and, in cooperation with regional governments, rank projects for inclusion in state and Federal transportation plans.

21. Memphis and Shelby County should establish an accelerated site and building plan approval process that can move quickly and flexibly when a potential tenant expresses interest.

22. Master planning at MEM and its surrounding area should be a flexible framework for accommodating a wide variety of tenants, users, facilities, and layouts that can be modified when new technologies, industries, and infrastructure emerge.

23. The Regional Logistics Council should periodically review the Memphis Aerotropolis logistics strategy, keeping abreast of mergers, highway congestion, fuel cost, and other factors that could affect the future direction of the logistics industry.

Recommendations Concerning Air Connectivity

24. Because airlines must be viewed as basic transportation infrastructure, no different from roadways and rail, strong efforts must continue to attract additional passenger and air cargo service to MEM.

25. The Memphis-Shelby County Airport Authority should pursue additional non-aeronautical revenue sources. Following airport city and aerotropolis principles, MEM must be thought of more in terms of a multifunctional commercial entity.



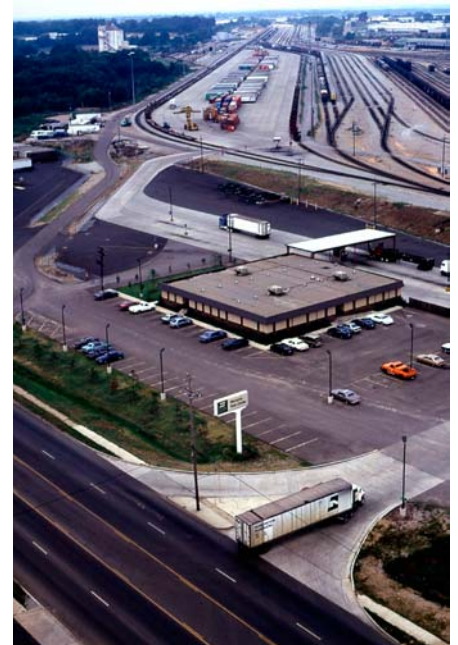
Marketing Recommendations

26. Memphis' Aerotropolis logistics-based marketing must be designed to successively attract a targeted segment of time-sensitive goods processing based on existing capabilities which, in turn, would serve as a catalyst to attract additional complementary firms to the MEM area and greater Memphis Aerotropolis.

27. Attracting additional time-sensitive manufacturing and distribution industries will require that Memphis International Airport (MEM) management build on its fast-mover advantage by integrating and leveraging all MEM elements for fast-cycle logistics.

28. Memphis city and regional leadership should establish a close working relationship with major commercial real estate firms and site selection consultants, regularly updating them on the continuing development of Memphis' Aerotropolis assets.

29. The Memphis-Shelby County Airport Authority and Memphis economic development organizations have taken an important step by "branding" the region as America's Aerotropolis.



Educational Support Recommendations

30. Faculty possessing logistics expertise should be among the recruitment priorities of Memphis colleges and universities, which should be producing more graduates with outstanding logistics expertise than any other location in the U.S.

31. To ensure that firms being recruited to the Memphis Aerotropolis have appropriately skilled workers and managers, a wide range of worker training, management education, and technology transfer functions should be provided.





Sustainable-Shelby

In 2008, Shelby County Mayor A C Wharton asked 130 citizens to accept his challenge to to develop its first sustainability agenda. The group created Sustainable Shelby, which addresses the issues of transportation and traffic; public building and public purchasing; neighborhood rebirth, public incentives, and building codes; and land use and development. It will serve as a blueprint for smart growth.

Aerotropolis complements and supports the following recommendations of Sustainable Shelby:

- Create/reinvest in a public realm that includes appropriately scaled parks, schools, streets, and plazas– one size does not fit all.
- Create/reinvest in neighborhoods – not merely subdivisions – that are “complete,” walkable, and provide a sense of neighborhood.
- Produce a Comprehensive Plan for Memphis and Shelby County with guiding principles that provide a clear, predictable, positive vision.
- Identify Priority Development Areas and develop incentives for sustainable buildings in these areas.
- Re-build the City from inside out, placing emphasis on areas where public investment will yield the greatest immediate return.
- Provide incentives for reclaiming declining property in established neighborhoods.
- Emphasize connectivity on most development.
- Provide an analysis of the public transportation system, identify the deficiencies of the existing system, and expand or improve its network to ensure adequate accessibility to all neighborhoods.
- Develop an efficient multimodal system that moves goods and services effectively, maximizes the use of intermodal transportation facilities, and minimizes effects on residential areas.
- Direct more CIP funding for maintenance and updating of infrastructure and community facilities.
- Streamline and improve property acquisition and assembly for redevelopment in established neighborhoods.
- Increase the efficiency of the current transit network to develop performance criteria for transit facilities and to increase the frequency and reliability of transit vehicles.
- Create an entity and funding source focused on revitalizing neighborhood commercial centers using strategies that include incentives.
- Locate new public buildings strategically to take advantage of existing and planned mass transit, to reduce travel distance for a building’s uses, and to encourage private development in suitable areas with excess capacity and existing infrastructure.
- Demonstrate to the public the benefits of sustainable growth and development.
- Create better support systems and communication infrastructure for neighborhood associations.

NWA / DELTA

In 2008, Delta Airlines acquired Northwest Airlines, creating the world's largest airline and the first truly global carrier with major route networks throughout Europe, Asia, and the Americas. The new Delta will have the financial strength and network connections to better link Memphis to global markets, complementing Memphis International Airport's status as the world's busiest air cargo hub.

Northwest has long had a passenger hub at the Memphis International Airport; now with Delta, the global airline will provide service to 92 cities with 289 daily flights. The new Delta has already added flights to New York City; Washington, DC; Salt Lake City; McAllen and Lubbock, Texas and Columbus, Mississippi. Additional service may be added over time.

Memphis provides the new Delta with a flexible, uncongested, and low-cost alternative to other connecting hubs in the Southeastern United States. For example, Memphis is the only connecting hub that does not levy a Passenger Facility Charge to fund capital improvements. In 2008, MEM was ranked the 36th busiest passenger airport and was ranked third in customer service, according to J.D. Power and Associates. Moreover, the new Delta's expanded network will provide Memphis and the surrounding areas with potential opportunities for economic development, new investment, and increased tourism.

MEMPHISED

In 2005, a coalition of top business and public sector leaders came together to create a positive blueprint for our future. Memphis Tomorrow, Shelby County Mayor A C Wharton, City of Memphis Mayor Willie W. Herenton, and the Greater Memphis Chamber aligned behind the principal that economic prosperity for all residents in Shelby County was the key lever for positive community change. The Memphis Fast Forward initiative was created.

The Memphis Economic Development (MemphisED) plan serves as the economic development component of Memphis Fast Forward. It is a comprehensive initiative with sixteen partner organizations, working to implement fifteen economic development strategies that are grouped into five broad goals. MemphisED creates a blueprint for growth that can position Memphis and Shelby County for future success.

Within MemphisED, one of the five objectives is to grow key, targeted industries – Music/Film, Biosciences, Logistics, and Tourism. Research has determined that Memphis/Shelby County is most competitive. Prioritizing economic development investments in the creation of jobs in these sectors will enable Memphis/Shelby County to maximize the impact of its resources. Development activities include the retention and expansion of existing firms, development of new local companies, and recruitment of outside firms. More specifically, the plan calls for the development of a comprehensive Logistics/Aerotropolis strategy. With the Greater Memphis Chamber serving as the lead, this strategy is being developed and implemented by the Regional Logistics Council. Details of the strategy include the findings of the already funded Regional Infrastructure Study; full leverage of the Airport and the “Aerotropolis” concept; inputs from the Biologistics and Bioagriculture Plans; and the development of strategic partnerships with other major U.S. and international logistics centers.

Aerotropolis Gateways and Beautification Work Group
Dr. Shirley Raines, Chair
Action Plan

Year 1: 2008-2009

Elvis Presley Blvd./Brooks Road Gateway

- Assist city agencies in completion of State Enhancement grant documents & contract
- Assist city agencies in design process for improvements to intersection
- Initiate bid process to select contractor for completing improvements through the city
- Begin construction in 2009

Plough Blvd/I-240 Airways Interchange Gateway Maintenance

- Clarify current city agency maintenance and funding responsibilities for Plough Boulevard
- Encourage an agreement for a single responsible city entity for maintenance
- Identify Public/Private Partnership & value sponsorships for improvements at key locations
- Encourage the immediate cleanup of the Plough Boulevard Gateway
- Select design firm to complete landscape master plan, and complete master plan in 2009

Corridor 2 Visual Survey – Airways Boulevard

- Complete digital photography survey of the Airways corridor from North Parkway to Stateline Road
- Document conditions for presentation to stakeholders in area
- Classify conditions and opportunity areas
- Establish process for identifying code and other city ordinance violations and submit complaints and maintenance requests to proper city agencies

Overall Urban Design Theme/ Template

- Seek funding for Design in Airport West Master Plan
- Incorporate design template into scope of work

Year 2-5

- Develop methods to improve aesthetics and environmental sustainability of the airport area
- Begin implementation of Master Landscape Plan for Plough Boulevard
- Provide special design and image appearance emphasis for all gateway entranceways to the airport
- Select priority gateways and begin improvements on systematic basis through priorities

Aerotropolis Marketing and Branding Work Group
Arnold Perl, Chair
Action Plan

Year 1: 2008-2009

Executive Summary of Aerotropolis Report

- Prepare draft layout of Executive Summary Report
- Obtain new photographs for Executive Summary Final Report
- Prepare final layout for review & complete printing

Aerotropolis Visual Tour

- Solicit images and graphics from partners in corridors to use in promotional video
- Develop base map for graphics overlay
- Prepare prototype for a corridor
- Complete visual tour for presentations, website and other promotional opportunities.

Website

- Develop "Initial" Aerotropolis component for website
- Incorporate Aerotropolis into new Chamber website

Speaker's Bureau

- Develop Aerotropolis Presentation for local use
- Revise presentation as images are available
- Train presenters in Aerotropolis message

Publications/Print Media

- Incorporate Aerotropolis into InBound Logistics article
- Incorporate Aerotropolis into journalist Red Carpet Tour
- Develop the Aerotropolis theme in articles for 2009 Hub Magazine

Year 2-5

- Develop marketing strategy to leverage Airport Cities Conference to be held in Memphis
- Focus Memphis Aerotropolis competitive advantage on improved connectivity, speed, and agility versus traditional governmental incentives
- Improve fast cycle logistics environment through marketing and improving aviation related service for cargo and passengers.
- Take advantage of the Aerotropolis location, transportation infrastructure, FedEx, Memphis International Airport and service providers which create Memphis' unique selling proposition
- Communicate message that Aerotropolis development and downtown development go hand in hand
- Establish cross jurisdictional cooperation with established protocols among local governments for companies desiring to locate in Memphis.

- Emphasize the importance of Memphis' logistics-based capabilities in attracting time-sensitive goods processing businesses
- Encourage Memphis International Airport management and local economic development officials to bring experts in logistics and supply chain management, multimodal infrastructure development, and telecommunications to properly leverage Memphis International Airport's assets
- Establish a close working relationship with corporate relocation and site selection consultants, making them aware of the Memphis Aerotropolis.
- Continue to brand Memphis under the Aerotropolis theme that will become increasingly familiar
- Encourage Memphis colleges and universities to emphasize logistics expertise among their faculty recruitment priorities

Aerotropolis Corridor Development Work Group

Larry Jensen, Chair

Action Plan

Year 1: 2008-2009

Develop a Master Plan for Corridor 1: Airport West

- Incorporate Memphis Airport Area Development Corporation boundaries as the Master Plan Study area
- Bring interested groups together and secure funding
- Solicit Request for Proposal, select consultant, execute contract
- Undertake work plan
- Carry out plan adoption process through city and county governments.
- Implement short term plan recommendations

Organizational Development Corridor 2: Airways Boulevard Area

- Identify boundaries for a redevelopment corporation
- Establish baseline conditions
- Identify companies in corridor & solicit support for a redevelopment corporation
- Form and organize an Airways Boulevard Area Development Corporation
- Assess requirements for master planning
- Use visual survey to identify problems to be submitted to city and county agencies for repair or maintenance

Year 2-5

- Implement remaining recommendations of Corridor 1 Master Plan
- Prevent encroachment of incompatible uses adjacent to the airport.
- Develop zoning for Aerotropolis and adjacent areas that supports airport-oriented businesses and industries
- Control land in and around the airport for airport expansion and logistics space
- Ensure appropriate supply and quality of hotel space serving the airport

- Evaluate applicability of Denver and Amsterdam Schiphol as models for governance
- As an interim measure promote cooperation among Aerotropolis jurisdictions and a dialogue with working sessions to reach consensus on issues important to the Aerotropolis
- Consider establishing an interagency task force within MPO to integrate capital and operational planning and activities for the broader airport area
- Convince local governments that if speed and agility are the unique selling proposition, they will have to move quickly and flexibly when a company expresses interest.
- Establish an education and training center to provide a wide range of worker training, management, education and transfer functions.

Aerotropolis Access and Transportation Work Group

Julie Ellis, Chair

Action Plan

Year 1: 2008-2009

Airways/ I-240 Interchange

- Complete Interchange Modification Study
- Contact TDOT Commissioner of Transportation to encourage expediting the FHWA approval letter
- Initiate Nonconnah Creek bridge replacement using city capital improvement budget funds (\$500,000)
- Continue to reinforce priority for TDOT funding through a Memphis Chamber road priorities presentation and a follow-up letter to encourage expediting the project.
- Request funding for Environmental Assessment for defined projects
- Meet With state officials to secure a schedule for full funding of improvements
- Ensure design merits of an appropriate “door” to the airport area

U.S. Highway 78/ Interstate 22 (Stateline to I-240)

- Meet with TDOT to present priority road project and produce a follow-up letter to encourage expediting the US 78/Interstate 22 project.
- Work with University of Memphis to define affected logistics businesses
- Assess impact from growth of BNSF railroad yard expansion
- Meet With TDOT to initiate project environmental assessment
- Hold an advance meeting with land owners to seek Right of Way Dedication
- Develop Legislative Strategy for funding construction
- Continue communications with TDOT to advance Schedule & Funding
- Ensure design merits for an appropriate “door” to the airport area

Interstate 69 (north segment I-40 to Millington)

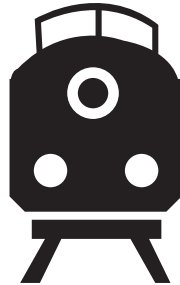
- Re-initiate EIS With TDOT
- Seek Legislative support for continued funding of design
- Advance Consultant Selection with TDOT
- Initiate Design
- Meet With State and Federal Officials to encourage Right of Way and construction funding

Plough/ Winchester Interchange

- Present road priorities to TDOT and follow up letter for continuation of the project
- Continue to reinforce priority for TDOT funding
- Release project hold, re-initiate design, and initiate funding
- Complete design
- Continue communication with TDOT to advance schedule and funding

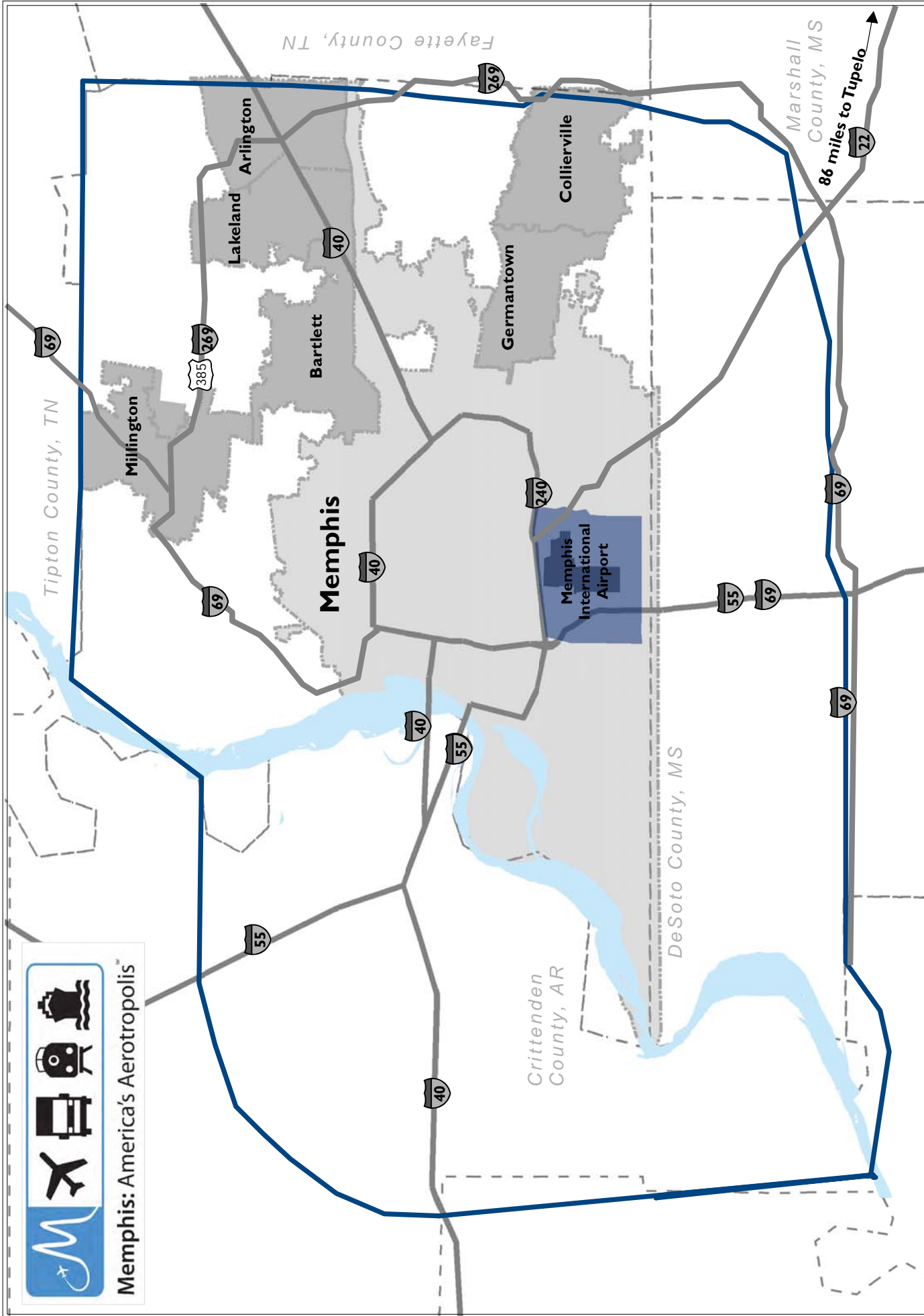
Year 2-5

- Maintain and expand the Delta/Northwest Airline Passenger Hub
- Continue to upgrade the airport within the fence
- Upgrade highway connections to interstates (i.e. Holmes Road interchange with I-55 and telecommunications infrastructure serving the rail intermodal complexes and the airport
- Enhance the region's highway infrastructure, including I-69, I-22, and the bridge on the Mississippi River; develop strategies for each of these key improvements
- Evaluate and enhance Memphis International Airport's intermodal transportation infrastructure (e.g. Cargo Central, etc.) and connections to other intermodal facilities where feasible
- Consider implementing forms of public transit that meet the needs of the air appearance
- Form a regional logistics committee to periodically review the Memphis Aerotropolis strategy
- Continue strong efforts to attract additional passenger and air cargo service to Memphis International Airport
- Encourage the Memphis-Shelby County Airport Authority to pursue additional non-aeronautical revenue to compensate for its lower airline fees





Memphis: America's Aerotropolis™



- Aerotropolis
- Memphis Int'l Airport
- Airport City

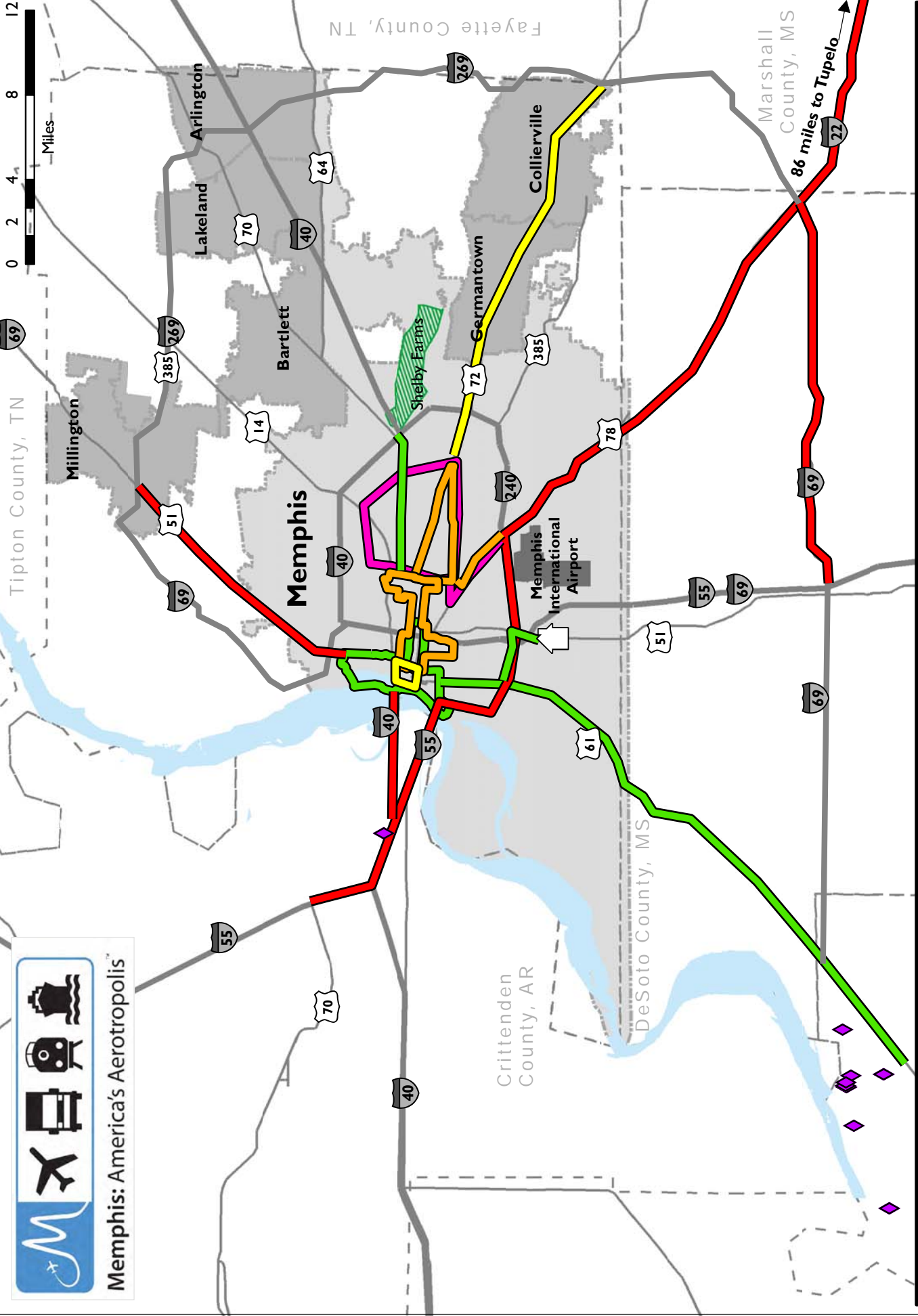


Aerotropolis Boundaries

Map Created 02 December 2008 by the MRC Research Dept.
Sources: TDOT, ESRI, MSCAA, Port of Memphis, FAA, & SUDS



Memphis: America's Aerotropolis™

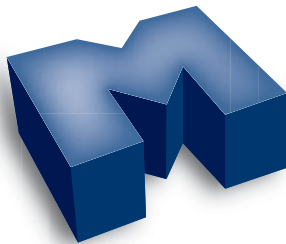


Aerotropolis Corridors

Map Created 03 December 2008 by the MRC Research Dept.
Sources: TDOT, ESRI, MSCAA, Port of Memphis, FAA, & SUDS



-  Logistics Corridor
-  Office Corridor
-  Entertainment Corridor
-  Education Corridor
-  Medical & Cultural Corridor
-  Casinos
-  Graceland



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