2011

Improving Air Cargo Infrastructure in the Developing World: A Study of Pune Maharashtra, India

Jordan Dekker
Eastern Michigan University

Follow this and additional works at: http://commons.emich.edu/honors

Recommended Citation
http://commons.emich.edu/honors/267

This Open Access Senior Honors Thesis is brought to you for free and open access by the Honors College at DigitalCommons@EMU. It has been accepted for inclusion in Senior Honors Theses by an authorized administrator of DigitalCommons@EMU. For more information, please contact libir@emich.edu.
Improving Air Cargo Infrastructure in the Developing World: A Study of Pune Maharashtra, India

Abstract
This research paper examines air cargo infrastructure in the developing world and seeks to apply those findings to the specific air cargo infrastructure situation in Pune, Maharashtra India (a medium-sized city in need of airfreight infrastructure improvements), as well as determine how it will benefit businesses and the economy. By examining the current state of the air cargo industry, throughout India and the rest of the world along with insights from within the industry popular press and academic journal articles, it was determined that effective usage of facilities and integration (separate parties working together to ensure efficient flow of cargo) and links between other points in the supply chain are important in designing a logistics facility. Additionally, in planning for both intermodal and air-cargo-only facilities, input and buy-in from relevant stakeholders will be very important to ensure the success of a project in Pune. Improved capabilities would allow companies to reduce their costs, and could also have a positive effect on the secondary (non-manufacturing) sector.

Degree Type
Open Access Senior Honors Thesis

Department
Marketing

First Advisor
Dawn Pearcy

This open access senior honors thesis is available at DigitalCommons@EMU: http://commons.emich.edu/honors/267
IMPROVING AIR CARGO INFRASTRUCTURE IN THE DEVELOPING WORLD:
A STUDY OF PUNE, MAHARASHTRA, INDIA

By

Jordan Dekker

A Senior Thesis Submitted to the
Eastern Michigan University
Honors College
in Partial Fulfillment of the Requirements for Graduation
with Honors in Marketing

Approved at Ypsilanti, Michigan, on this date: May 3, 2011
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>3</td>
</tr>
<tr>
<td>Introduction</td>
<td>4</td>
</tr>
<tr>
<td>Background</td>
<td>4</td>
</tr>
<tr>
<td>Pune Description</td>
<td>9</td>
</tr>
<tr>
<td>Necessary Infrastructure for International Air Cargo Facilities</td>
<td>13</td>
</tr>
<tr>
<td>Examination of Other Air Cargo Facilities in India</td>
<td>16</td>
</tr>
<tr>
<td>Examination of Air Cargo Infrastructure Development in China</td>
<td>19</td>
</tr>
<tr>
<td>Application of Observations from Other Cities to Pune</td>
<td>20</td>
</tr>
<tr>
<td>Examination of Intermodal Facilities Throughout the World</td>
<td>24</td>
</tr>
<tr>
<td>Intermodal Applications to Pune</td>
<td>32</td>
</tr>
<tr>
<td>Summary of Recommendations</td>
<td>38</td>
</tr>
<tr>
<td>Conclusion</td>
<td>38</td>
</tr>
<tr>
<td>Works Cited</td>
<td>42</td>
</tr>
</tbody>
</table>
Abstract

This research paper examines air cargo infrastructure in the developing world and seeks to apply those findings to the specific air cargo infrastructure situation in Pune, Maharashtra India (a medium-sized city in need of airfreight infrastructure improvements), as well as determine how it will benefit businesses and the economy. By examining the current state of the air cargo industry, throughout India and the rest of the world along with insights from within the industry popular press and academic journal articles, it was determined that effective usage of facilities and integration (separate parties working together to ensure efficient flow of cargo) and links between other points in the supply chain are important in designing a logistics facility. Additionally, in planning for both intermodal and air-cargo-only facilities, input and buy-in from relevant stakeholders will be very important to ensure the success of a project in Pune. Improved air cargo capabilities would benefit Pune’s economy by encouraging businesses to locate there and contribute to India’s manufacturing output goals. Improved capabilities would allow companies to reduce their costs, and could also have a positive effect on the secondary (non-manufacturing) sector.
Introduction

Pune, Maharashtra, India is a city that is experiencing rapid growth in a number of industries. However, Pune’s airport, Lohegaon International, has extremely limited domestic air cargo capacity and no international cargo capacity at all. Representatives of Pune’s industries have been fighting to have international air cargo facilities available at the airport, and customs is currently considering approval. When approval is granted, Pune will need to examine how to develop its air cargo infrastructure, including on-airport processing facilities, cargo storage facilities, airport aircraft handling capabilities, and integration with the rest of the air cargo supply chain, among other things. Given the current situation, this paper will seek to answer the question: How can Pune, India’s international air cargo infrastructure, be improved, and how will this benefit business from a supply chain management perspective?

Specific aspects of this question include:

- What kinds of infrastructure elements are necessary for modern, international cargo facilities?

- What infrastructure problems have been identified at other Indian air cargo facilities, and how have some of these problems been resolved? How can these problems and their solutions be applied to Pune?

- What is an intermodal hub comprised of, and could this be successful in Pune?

Due to lack of academic research on this topic, background information will be compiled largely from popular press information on current events and the current state of the industry.

Background

A 2007 study indicated that air cargo in India uses a combination of couriers’ own aircraft and aircraft of other companies (such as passenger airlines) (Varshney and Sahay,
The study also found that intermodal services are being used in India, particularly within single carriers. For example, Blue Dart, an India-based courier service, transports packages by truck to airports from cities without air cargo service, flies them to the airports closest to their destinations, and if necessary transports them by surface transportation again to the point of delivery. Blue Dart provides this service at a rate in-between surface pricing and priority pricing. The study also found that most international cargo operators in India have established facilities in order to serve their customers outside India, but have relied on the networks of domestic Indian players to transport packages within India (Varshney and Sahay, 229, 237). FedEx has been working on developing its own network in India, and in November 2010 purchased AFL, its primary freight services and delivery provider in India ("Fedex Buys India Operator").

The air cargo industry in India has been experiencing a large amount of growth over the past several years. Currently, India handles approximately 1.11 million tons of international air freight. Approximately half of it is bound for the U.S. and Europe, while 25 percent is bound for Asia and 20 percent is bound for the Middle East (Mathews). This year alone, the country’s air cargo volume has increased 6.8% internationally and 9.9% domestically ("Air cargo industry set"). India’s air cargo volume during 2010 was expected to grow 12-14 percent over the previous year ("Air cargo industry set") and air cargo yields were projected to rise 3.1 percent over the previous year (Mathews). The amount of growth being experienced is very important to this topic, as facilities that are already inadequate (such as Pune’s air cargo facility) are experiencing greater demand. Therefore, the modernization and development of these types of facilities are crucial to the success of India’s air cargo industry.

While the industry is clearly experiencing a large amount of growth, recent literature suggests that there are several factors hindering the growth of the industry. At the same time,
literature suggests that many positive developments are occurring both in airport infrastructure and in the regulatory environment.

India’s major airports are currently undergoing improvements and upgrades in order to satisfy international standards. The country’s five major airports account for 93 percent of international freight and 84.4 percent of domestic cargo (“Strategic Analysis of Air Cargo”), with Mumbai accounting for the largest amount of all the major airports in India (Mathews). Once widespread infrastructure issues are solved, India is expected to experience rapid growth in the following five years (“Strategic Analysis of Air Cargo”).

One significant challenge lies in infrastructure for domestic air cargo. Where cargo facilities are available, most of them are restricted to international freight. There is little availability of warehousing space in medium sized (tier-2) and smaller sized (tier-3) cities, and there has been little opportunity for private-market firms to operate these types of facilities (“Strategic Analysis of Air Cargo”). Currently, only 660,000 tons of India’s 1.77 million tons of air cargo are transported domestically (Mathews).

India’s bureaucracy has discouraged developers from pursuing aviation development in India, but the size of the market is expected to outweigh fears of bureaucracy (“Developing China”). Additionally, India is becoming increasingly open to foreign direct investment in the air cargo industry. While foreign direct investment in passenger operations is capped at 49 percent, 74 percent of foreign direct investment is permissible for cargo airlines. Additionally, 100 percent foreign direct investment is permissible for existing airports and for greenfield construction airports (airports that do not currently exist and are being built from scratch). Also, there are 100 percent tax exemptions available for airport projects over a period of ten years (“Strategic Analysis of Air Cargo”).

India’s air cargo industry faces very complex problems, including inadequate infrastructure, regulatory restrictions, fragmented electronic data interchange implementation
by Customs, and security hazards ("Air cargo industry set"). Even with the modernization of Indian airports, cargo is often neglected. For example, at a new airport in Bangaluru, workers find themselves without a dedicated cargo facility.

"The new Bengaluru airport started-off without adequate office facility and warehouse area for the cargo agents," said Prem Kumar, chairman of the Air Cargo Agents Association of India’s Bengaluru region. He further stated, "Even now, we are operating from temporary facilities hoping that Bengaluru would complete the cargo village within the airport" ("AACI regional committees" 22). At the Chennai airport, which is currently being modernized, cargo operators have concerns about the level of priority that developing world-class cargo facilities will receive. There is concern that developments being made are primarily cosmetic changes and that projects only take the immediate future into account ("AACI regional committees 22).

Conditions are difficult even at major facilities such as Mumbai. Firdos Fanibanda, chairman, ACAA\textregistered western region stated: "At the airport, we cannot expand much. Offloading cargo at Mumbai airport is a time consuming process. Long queues of trucks block the entrance and normal movement of vehicular traffic. We have a long way to go before airlines, customs and agents are EDI connected" ("AACI regional committees" 22).

Customs and integration of electronic data interchange are problems that cause large amounts of delays in transportation of cargo. Cargo spends an average of 3 to 5 days at Indian airports, compared to 4 to 6 hours at airports elsewhere ("Strategic Analysis of Air Cargo").

Even if the air cargo infrastructure were to be improved, significant problems would remain from many overall insufficiencies in the country’s transportation infrastructure. Air cargo storage and handling facilities, which are largely the focus of improvement efforts, are still not adequate without integration of those facilities with other modes of transportation. Larger problems remain in the overall system, including "insufficiencies in freighter aircraft,"
road and rail connectivity with cargo hubs, feeder networks, security and trained personnel.” (Mathews). Likewise, an increase air freighter capacity would not solve the problems. India’s freighter utilization is adequate. Mr Chethan Kambhi, Frost and Sullivan’s Senior Research Analyst, Aerospace and Defence said that if utilized effectively, airlines’ aircraft belly capacity should be sufficient (Tandon).

Mr. Sushi Shyamal, Partner, Transaction Advisory Services, Ernst and Young (E&Y), says that recent cargo improvement announcements reflect mostly “peripheral changes,” and instead India needs “an integrated logistics approach that covers the first mile and last mile connectivity” (Tandon). One solution to this is developing multi-modal transportation hubs. Plans are being developed for a Multimodal International Hub Airport (MIHAN) in Nagpur. A multi-modal transportation hub is similar to a normal hub, but brings together multiple transportation modes into one hub facility (rather than only handling a single mode) (Battaglia 2). Cargo facility upgrades, although not necessarily multimodal, are being planned for Mumbai and would also be needed in airports such as Chennai, Kolkata, Hyderabad, and Bangalore. (Tandon). Nevertheless, sufficient “common user” facilities are a must, even if not intermodal. At airports without common user facilities, load tendering and retrieval is done in open areas, which is problematic at night and in bad weather (“Express Cargo”).

Multi-modal air cargo facilities are necessary to establish efficient hub and spoke distribution systems that “will result in lower costs, greater economic viability of operations, and the ability to compete effectively with cheaper alternative modes of transport such as rail and road” (Narayanan, 22). These multi-modal facilities must bring together “cargo complexes, warehousing and storage facilities and improved aviation facilities for cargo handling” (Narayanan, 22). Additionally, Narayanan (22) states that effective public-private partnerships can facilitate private investment to make these facilities a reality. This is what the multi-modal project in Nagpur hopes to accomplish.
Challenges that would still remain are developing adequate cargo facilities in “spoke” airports, as well as easing the burden of customs procedures to ensure that goods can move expeditiously through these hubs. (Narayanan, 23). Additionally, integrating road transportation into the inter-modal system could prove problematic, due to poor condition of roads (resulting in high vehicle wear and tear), traffic congestion, and slow speed. The average rate of speed on Indian highways is 20 miles per hour, compared with 40 miles per hour in the west (“Express Cargo”).

Pune Description

Pune, also known as Poona, is in the western portion of the state of Maharashtra, about 90 miles from Mumbai. It is the eighth largest city in India by population, with an estimated city population of 3,446,330. The metropolitan area (including Primpi Chinchwad, Pune’s industrial twin) had an estimated total population of 4,485,000 in 2005. While Marathi is the official language, English and Hindi are also widely spoken. (“Demographics of Pune”). Hinduism is the most widely practiced religion, with Sikhs, Muslims, and Christians also present (“Pune Religions”).

Pune, which has been referred to as “The Oxford of the East,” is very well known for being home to a large number of colleges and universities (“The Oxford of the East”). Pune is home to 110,321 students who attend 535 colleges and universities (“Pune Municipal Corporation Infrastructure”).

Pune is also home to operations in many different types of industries. Pune is known for, perhaps most notably, the automotive, software, and information technology industries. Because it is home to factories for so many auto companies, Pune has become known as the “Detroit of India” (“Pune Guide”). In a press conference announcing an expansion of Bajaj’s manufacturing operations in Pune, Madhur Bajaj, vice chairman of Bajaj auto and president of the Maharashtra Chamber of Commerce Industries and Agriculture, said: “Pune has
become the largest auto manufacturing centre with the entire spectrum of automobiles being produced here. This has led to the creation of a vast network of component vendors who offer international quality work” (Gadgil and Athavale).

Automotive companies with operations in Pune include:

- Baja Auto
- Tata Motors
- Mercedes Benz
- Kinetic Engineering
- Force Motors Ltd (previously known as Bajaj Tempo).

Engineering companies in Pune include:

- Bharat Forge Ltd, (world’s second largest forging company)
- Cummins Engines Co Ltd, (Research & Technology India center)
- Thermax Limited (a global company focused on energy and environmental sustainability,
- Alfa Laval,
- Sandvik Asia,
- Thyssen Krupp (formerly Buckau Wolff),
- KSB Pumps,
- Finolex,
- Greaves India

Additional well-known companies in Pune include Whirlpool and LG (both with appliance manufacturing plants) and Frito-Lay and Coca Cola (with food processing plants) (“Economy of Pune”).
Pune also has a large agricultural industry, which international air connectivity is very important to ("Economy of Pune"). Bananas ("Pune emerging as a major hub"), roses ("Rose prices witness a rise") and pomegranate ("Pune fruit exports") are particularly prevalent agricultural exports in the Pune region. Overall, the Pune-Western Maharashtra region accounts for around 30-40% of the state’s engineering exports and more than 50% of the state’s agricultural exports (Nair).

Pune’s current airport, Lonhagaon International Airport, shares its runway with the Lonhagaon Air Force Base. This results in landing and coordination issues between Airports of India (India’s civil airport governing authority) and the Indian Air Force. Currently, the air force only allows between 35 and 38 commercial flights to operate from the airport each day. With pending additions to the Air Force’s fleet at Lonhagaon, it is expected that further restrictions could be put in place ("Pune, in a jam"). Currently, commercial flights are not allowed during a two-hour time window in the morning and three-hour time window in the evening ("Focus on world-class facilities").

According to Viswash Kothari, in a July 2010 Times of India article, the cargo infrastructure at Lonhagaon Airport is extremely inadequate for supporting the area’s potential. Lonhagaon is not authorized to handle international air cargo. There is, however, a great need for comprehensive international cargo capabilities in Pune. The airport has applied for customs authorization to accept international shipments into the airport. As of July 2010, the customs department had begun the process of granting approval, but no additional progress has been announced. Many goods produced in the Pune area are exported, but must be transported by trucks (sealed by customs) to and from a 15-mile away Inland Container Depot (ICD), then onto other airports. The fact that 40 percent of international freight moving out Jawaharlal Nehru Port Trust (JNPT) near Mumbai originates from the Pune area shows that there is a vast potential for air freight from Pune (Kothari).
The airport currently has extremely limited capacity for air cargo. Apron space is inadequate, cargo facilities are inadequate, and space for new cargo facilities is non-existent. Adding to the problem, at a macro-level, is Pune’s crumbling road infrastructure. Even if the airport were able to accept international cargo, getting the cargo to and from the airport (and within the city) would be a challenge in itself (“Pune, in a jam”).

Businesses in the area have long been demanding that customs officials allow the airport to handle international cargo (Kothari). It will be necessary for Pune to integrate a new cargo facility into the airport, in order to accommodate the increased volume and different nature of the products it will be processing. It will be very important to implement effective facilities and procedures for handling this cargo.

Authorities have been considering establishing a standalone civil airport in the Pune area for the past eighteen years (“Pune, in a jam”). Little progress has been made. Currently, the frontrunner city is Chakan. However, the airport developers have run into many problems and protests with land acquisition for the project. Farmers who would be affected have organized a group in opposition to the project (Khairnar). The government has decided to acquire nearby land if the farmers who own the preferred land will not sell. (Paranjpe) The project had a target finish date of December, 2011, but has maintained “status-quo” for he past few years. (Nambiar). While said Chief of Air Staff, Air Chief Marshal Pradeep Naik stated that the move would be quickened, no formal plans have been made for making the project reality (“Pune needs to push hard”).

Because of the constant delays, and the amount of time it takes to develop a new airport, Chief of Air Staff, Air Chief Marshal Pradeep Naik says that Pune focus on developing its existing airport (including cargo facilities) to international standards. (“Pune needs to push hard”).
Necessary Infrastructure for International Air Cargo Facilities

There are a number of requirements that go into the design of an international air cargo facility. First, there needs to be integration among the airport cargo facility and the rest of the logistics industry (Jarach, 121). Instead of simply viewing the air cargo facility as an independent spoke in the air cargo process, there need to be links and facilities for transitioning cargo to other logistics services (road, rail, and sea), as well as warehousing. Yuan, Low, and Tang (219) state

The airport cargo services and airfreight industry are integral components in the overall logistics industry, which plays a supporting (but critical) function in bringing cargoes from the airport to the recipients at different destinations (or from sources of productions to the airport) and providing the necessary storage and inter-modal transfer in process.

Services offered by air cargo terminals typically include the following (Chen, Chang, and Chau 673):

- Aircraft offloading
- Cargo arrival terminals
- Cargo breakdown
- Cargo Storage
- Cargo retrieval and cargo delivery
- Export process (including off-loading from trucks, export cargo acceptance, export cargo handling, cargo build-up, flight closing, ULD retrieval and cargo assembly
- Transfer process (including aircraft off-loading, handling of transfer cargo, cargo build-up, flight closing, ULD retrieval, and cargo assembly)
As for the physical facilities themselves, Yuan, Low, and Tang (219) divide the process into five activities: plan, source, make, deliver, and return. These five activity areas must be taken into account when designing an air cargo facility.

- Planning relates to making sure that the airport has adequate facilities and manpower to handle expected cargo volumes.
- Sourcing relates to the actual building of the airport facilities, coordinating outsourced activities, and hiring workers who will do the job right, minimizing misdirected, damaged or late cargo.
- Making includes processes such as cargo sorting, loading, and unloading. Efficient customs services are also necessary at international facilities.
- Returning refers to processes required to return damaged or misdirected cargo.

Making an airport attractive to cargo airlines is largely the result of designing cargo facilities in accordance with the plan, source, make, and return framework. Some factors airlines consider when choosing airport locations for cargo processing include:

- Adequate capacities provision (Meredith; Hufbauer et al., Dempsey and O’Connor 24-36, Buyck 70-79)
- Quick customs (Zhang and Zhang 275-287, Ohashi et al. 149-159, O’Conner),
- Low airport charges (Berechman and De Wit 251-274),
- Reasonable local labor costs (Adler and Berechman 171-181, O’Conner)
- Fifth freedom rights (Gardiner, Ison, and Humphreys 394)
  - “...the right or privilege, in respect of scheduled international air services, granted by one State to another State to put down and to take on, in the territory of the first State, traffic coming from or destined to a third State” (“Freedoms of the air”).
- Gardiner, Ison, and Humphreys (394), citing the Canadian Airports Council, state: “As air cargo only travels one way, freighter operators often seek to operate triangular routes to avoid a directional imbalance of cargo demand, which for international flights requires fifth freedom rights”

- Influence of freight forwarders (Gardiner, Ison, Humphreys 396)

- Improved infrastructure (Gardiner, Ison, Humphreys 397)

Many facilities, in their desire to accommodate customers’ requirements, face scheduling challenges, particularly in accommodating multiple pick-up and drop-off loads using a limited number of loading docks. Most cargo facilities offer free 48-hour storage to customers, but many customers still arrive close to the flight’s scheduled departure time. In addition to causing the problem of congestion in itself, this problem can also end up delaying flights due to late-arriving cargo (Ou, Hsu, and Li 83). According to Yuan, Low, and Tang’s study, in some instances increased landside capacity utilization can create congestions that have a negative impact on air cargo volume (221). This problem points again to the need for supply chain integration that includes the air cargo facility. Chen, Daugherty, and Roath define supply chain process integration as “the management of various sets of activities that aims at seamlessly linking relevant business processes within and across firms and eliminating duplicate or unnecessary parts of the processes for the purpose of building a better-functioning supply chain” (66). Ou, Hsu, and Li propose integrating the supply chain by handling processes that do not need to be performed right at the airport offsite, and scheduling consolidated, containerized shipments for particular flights to arrive just-in-time from third party logistics facilities located in close proximity to the airport (typically within thirty minutes) (84). Third party logistics companies perform activities in addition to containerization, including “preparing documents for air shipment, obtaining cargo insurance,
collecting items from their customers, warehousing, packing, tracing, etc." (Wu 3). All the activities that can be performed off-site help save valuable time and space at the airport facility. Using docks efficiently to receive shipments from these 3PL providers, in a just-in-time manner, can help alleviate the problems of high storage costs, congestion, and delayed cargo (Ou, Hsu, and Li 84).

Efficient management of manpower resources is also important, as manpower costs account for the largest share of all air cargo terminal operating costs. In particular, build-up and breakdown of aircraft cargo containers (known as unit load devices, or ULDs) at the airport facility is the most manpower intensive. Delivering full ULDs to customers is obviously the least labor-intensive option (Rong and Grunow 726-27). Therefore, delivering full ULDs to 3PL providers to tear down could provide for cost-savings.

Examination of Other Air Cargo Facilities in India

Mumbai

Many developments have been occurring in Mumbai’s air cargo infrastructure. Cargo Service Center (CSC), an air cargo services company, is building a 2000 square meter facility dedicated to perishable and temperature sensitive cargo. The facility, which was scheduled to open in December 2010, is able to support 50000 MT of cargo per year. Plans are underway to expand the facility by 1000 square meters, adding a 2000 additional MT of cargo capacity per year. (“New CSC India Terminals”). CSC is considering adding warehousing facilities for non-perishable cargo at Mumbai as well (“CSC to build and operate”).

CSC is also building an “air freight station” in Mulund, Mumbai that will provide for import and export related cargo processing and handling. An air freight station has also opened in Sabarmati, Ahmedabad (“New CSC India Terminals”). Air freight stations are located away from airports and closer to client facilities. They help reduce congestion at
airport cargo facilities caused by additional attention required for international cargo, and are more convenient for clients ("CSC to build and operate").

Delhi

Delhi has been undergoing extensive expansion and modernization in its air cargo facilities. The airport has concession agreements with two separate companies to develop and operate two separate cargo facilities. Cargo Service Center (CSC) is responsible for developing a greenfield cargo facility, and Celebis Delhi Cargo India (a subsidiary of Turkish company Celebi Hava Servisi A S) is undertaking renovation of the airport’s existing cargo facility. Before the development projects began, the airport already had an express cargo facility (run by CSC) that offers services including screening, palletization, and documentation, as well as a perishable cargo facility (also operated by CSC) ("CSC to build and operate").

The airport’s current cargo facility, now operated by Celebi, will be undergoing a number of modifications. Celebi is responsible for upgrading, modernizing, financing, operating, maintaining and managing the terminal. The following modernizations are part of the project ("Celebi in Delhi"):  
- Truck Docks equipped with dock levelers and overhead sectional doors  
- 10/20 Feet ULD handling Platforms  
- Extending the Existing Truck Dock to 8m to have spacious reception area  
- Biometric and smart card for access control  
- Fire fighting and detection System  
- Multi-level storage steel racks. Shed would be repainted  
- Volumetric Scanner with Conveyor Belts
Additional improvements underway include “truck management, flexible acceptance hours for export cargo, creation of sterile security zone, new handling equipment and movement of cargo on Euro pallets” (“Celebi in Delhi”).

Celebi has experienced many challenges in the modernization of the existing facility. The problems they faced were exacerbated by the fact that the facility modernization and regular operations are being done concurrently. A number of problems have caused disruption in work, including: “non functional Customs EDI, power outage from main supply of the airport and work stoppage by customs house agents (CHAs)” (“Celebi in Delhi”). Facility management said that they were able to resolve the problems and clear the cargo backlog quickly (“Celebi in Delhi”).

While Celebi is modernizing the existing cargo facility, CSC has plans to complete the first phase of its Greenfield cargo complex at the Delhi airport by March 1, 2011. The complex consists of two terminals, which will make extensive use of automation and handle all types of cargo, both domestic and international (including perishable, live animals, dangerous goods, and express cargo). The facility, when fully completed in March 2012, will be 70,000 square meters and have a capacity of almost 1 million MT per year (“New CSC India Terminals”).

CSC plans to offer “complete logistics solutions” through the greenfield facility. CSC plans to acquire about 25,000 square meters of warehousing space for public bonded activities. The facilities will be able to handle both air and sea cargo, including perishables, hazardous cargo, and electronics. In the domestic arena, CSC’s sister company, Transmart, is developing a similar 25,000 square meter facility for domestic cargo storage. (“New CSC India Terminals”).
Hyderabad:

Hyderabad is becoming a hot spot in India for pharmaceutical manufacturing. As a result, the airport has found itself in need of special cargo processing facilities to meet the diverse requirements needed for many of these products. The Hyderabad airport’s cargo facility has launched a dedicated “Pharma Zone” to handle these types of products. The Pharma Zone includes dedicated truck docks, a seamless cold chain facility, a dedicated area for products requiring storage from 2 degrees to 8 degrees Celsius, and a sterile area for products such as vaccines (“GHIAL and Menzies”).

The facility and its amenities are being made possible by a partnership between Lufthansa Cargo and GMR group, the operator of Hyderabad’s airport. Lufthansa is stationing its own fleet of cooling containers at Hyderabad’s airport. Martin Schlingensiepen, vice president of product management at Lufthansa Cargo said “The demand for temperature-controlled transport will continue to grow substantially in the coming years. A strong partnership with GMR Hyderabad International Airport will enable us to offer our local customers, a tailor-made product for the fast and reliable transport of pharmaceuticals” (“GHIAL and Menzies”).

Examination of Air Cargo Infrastructure Development in China

Like India, China is a developing country that is suffering from inadequate air cargo capability. During the 1990s, only ten percent of China’s airports could handle large aircraft and the country’s air cargo facilities could only handle 65 percent of demand (Fung, Zhang, Chi-Kin Leung, and Law). As a result, China has been paying a lot of attention to developing its air cargo infrastructure to support growth in its economy. In early April, 2011, China’s government released details of a plan to spend $64 billion building 97 new feeder airports and upgrading existing airports throughout the country. Elements of the plan include:

- A second airport in Beijing
A cargo station for customs clearances in Dongguan, connected to Baiyun Airport cargo center through an information platform. The main objective of opening this station is to lower costs.

Pudong airport has experienced capacity challenges. In addition to recent opening of a third runway, a 140,000 square meter perishable goods warehouse is planned.

(“Beijing Roles out Plans for”)

China is also focusing on building not only airports, but also logistics parks to link manufacturing plants with airports (“Developing China”).

Hong Kong has already begun developing enhanced facilities to handle increased air cargo volumes. Facilities at Hong Kong’s airport include:

- Two air cargo terminals (operated by separate companies) located immediately off the highway
- Tradeport Hong Kong, a nearby facility run by a multinational consortium (including operators of the Frankfurt, Germany and Amsterdam (Schipol), The Netherlands airports). This facility focuses on fast transport of high-value goods, and is the beginning of a larger logistics complex planned for the area.
- DHL Express Center

H.Kong has also signed a cooperation agreement with nearby regional airports to help boost Hong Kong’s role in air cargo (Page 26-27).

Application of Observations from Other Cities to Pune

There are a number of ways that developments in the air cargo infrastructure in other Indian cities can be applied to the situation in Pune. First, air freight stations should be placed in nearby industrial cities to perform processing activity for air cargo before it reaches the
airport. This is the concept that CSC is using in Muland, Mumbai to achieve the same benefits. The concept is also being used in China. Pimpri/ Chinchwad, with its automotive and electronics industry, would be excellent candidates for these types of facilities. Under this system, cargo originating in or being shipped to the Pimpri/Chinchwad area would leave the Pune airport facility without being processed (essentially, still in containers). Cargo would clear customs and containers broken down at the air freight station, reducing congestion at the Pune airport. Collaboration with others in the air cargo supply chain, particularly originating airports, would be essential to making this a success. All cargo bound for Pimpri/Chinchwad would need to be shipped in the same containers in order to eliminate the need for sorting the cargo at the airport facility. Arrangements would also need to be made with customs officials to allow for off-airport clearance, and for customs officials to have access to the goods before they reach the formal clearance location if requested (“Air freight station”). Additionally, an off-airport facility in close proximity could be established to serve the same purpose for locally bound cargo as well as cargo bound for areas without enough volume to necessitate their own air freight stations.

Secondly, with Pune’s agricultural industry, having storage facilities for perishable cargo will be essential to the success of an air cargo operation. As previously discussed, Mumbai and Delhi have both identified needs for this in their regions as well, and have integrated these into their air cargo complexes as well. In other cities, the perishable facilities are operated by private corporations. While a perishable storage facility will most likely be necessary at the airport as well, there could also be opportunity for having facilities for perishables at air freight stations, or even developing special perishable air freight stations in areas from which significant amounts of perishables are exported. The Maharashtra State Agricultural Marketing Board (MSAMB) has set up export facility centers for certain products in areas they are grown in (for example, a pomegranate export facility center in
Pune) ("Export promotion"). These centers consist of facilities for processes such as pre-cooling, cold storage, handling, and ripening. There could be opportunities to collaborate with these facilities and create on-site air freight stations to handle air cargo export formalities. There could also be opportunities for air freight station operators to collaborate with the MSAMB to set up additional facilities, creating a win-win for both the agricultural industry (with increased production through exports) and the air cargo industry (with more air cargo to process and transport).

Automated air cargo process capabilities can help reduce costs greatly, both at on-airport facilities and off-airport air freight stations. This is particularly true in certain processes, such as sorting of cargo after breakdown, cargo retrieval, the export/import paperwork process. Perhaps most importantly for on-airport facilities, automation is important in the transfer sorting process for cargo being transferred onto other flights to their final destinations.

The ability of the airport and air cargo facility to collaborate and integrate themselves with additional firms in the supply chain is an extremely important factor affecting the success of the airport’s air cargo operation. The facility’s management will need to work with individual customers, including encouraging them to work with air freight stations or other off-site locations to streamline inputs into the air cargo facility. In order to reduce congestion, the management of Pune’s facility might want to consider requiring that shippers ship their items through an off-site air freight consolidation provider. The facility will also need to plan for an adequate number of docks (including room for additional docks), and schedule deliveries from the off-site locations efficiently. While the intent will be for cargo to arrive in a just-in-time manner, the facility will also need to plan for adequate amounts of on-site storage for cargo that will need to be stored for short periods of time. This is necessary because it might not be practical to have 100% of shipments arrive just in time. Additionally,
because flights could be late, this storage facility will be necessary to store goods that cannot be loaded onto airplanes because they have not yet arrived. However, it is important that facility management understand that empty space in the storage area is a good thing, and not to stray from a just-in-time system just because space is available. Assuming this facility were to be developed at the current Pune airport (which is shared with an air force base), it is important that the airport and air cargo facility work with the air force base to integrate air cargo flights into the allotment and time schedule for civilian flights. Problems with flights being unable to depart and/or land would cause major problems in the facility’s landside just-in-time operations. Well-designed electronic data interchange capabilities are extremely important in integrating the air cargo facility with the rest of the supply chain. The airport facility must be able to communicate electronically with the off-airport facilities. Additionally, both the airport and off-airport facilities must be able to communicate with customs in order to efficiently clear the imported and exported cargo. Problems with customs EDI systems have caused major problems in the past (as in Delhi) (“Celebi in Delhi”). It will also be very important for the facility to integrate itself with other modes of transportation (such as ground and sea transportation). This will be examined in the Intermodal Applications section of this paper.

Partnerships between air cargo facilities and other airports can also be beneficial. Pune could consider forming partnerships with other area airports (particularly Mumbai) to serve as a reliever to Mumbai or to reroute certain cargo to Pune. Perhaps a government “master plan” for air cargo (similar to the one China’s government has created) created by the government could be beneficial as well.

Finally, given the potential for continued growth, it is important that the facility be designed with the future in mind. While future events and needs are by nature uncertain, the facility should be designed with the ability to expand it in the future.
Examination of Intermodal Facilities Throughout the World

Nagpur

The Multimodal International Hub at Nagpur (MIHAN) is an ambitious project that has been under development for the past four years (“Nagpur logistics”). A multimodal facility can be most comprehensively defined in the following contexts:

“#1. Containerization, piggyback service, or other technology that provides seamless movement of goods and people by more than one mode of transport.

#2. Providing connections between different modes (such as highways to ports, or bus feeder service to rail).

#3. A holistic view of transportation in which individual transportation modes work together or within their own niches.”

(Battaglia, 2)

Like the plans for a new airport in Pune, the plans for MIHAN have been plagued by setbacks (Dravekar). Nagpur, with a population of 2.4 million people, is located almost directly in the center of India. MIHAN is not just an airport expansion project, but in essence the building of a miniature city whose economy is driven by the logistics industry. The Rs3 billion ($65.2 million) (“Nagpur logistics”) which is not expected to be fully complete until at least 2040, consists of:

- An international airport
  - expanded from the current 400 hectares to 1364 hectares (Nagpur Mihan)
  - A new runway and expansion of the existing runway (“Multi-modal airports”)
  - Capacity to handle 870,000 tons of cargo (“Nagpur logistics”)
  - 60 hectare air cargo terminal (“Nagpur logistics”)
    - Capacity for 1000 trucks (“Nagpur logistics”)
- Road and rail hub – 83 acre (“Slowdown pushes Mihan”)
- Expected to start in 4 years
- Expandable according to demand by adding warehouses

- A special economic zone of 2086 hectares (Nagpur Mihan) which will provide a majority of additional traffic for the airport (“Multi-modal airports”)
  - Allows for “duty-free import of capital goods and raw materials. In addition, investors will benefit from attractive fiscal incentives, a soft tax regime, productivity-friendly labour laws and simpler regulatory procedures” (“From manufacturing to logistics”).
- 1472 hectares for processing units, and 614 hectares for service sector units.

(Nagpur Mihan)

- 14 public warehouses (“Nagpur logistics”)
- 500 hectare information technology park with necessary IT infrastructure (Nagpur Mihan)
- 40 hectare health city with hospitals and medical schools (Nagpur Mihan)
- Manufacturing industry unit (Nagpur Mihan)
  - Textile and garment
  - Gems and jewelry
  - Food processing
  - Pharmaceutical/biomedical
  - Finance/insurance companies

- Central facility building (government/administration) (Nagpur Mihan)
- International school (“From manufacturing to logistics”)
- Dedicated sewage treatment plant (Nagpur Mihan)
• Water treatment plant (to provide bacteria-free drinking water) ("From manufacturing to logistics")

• Telephone exchange buildings (+fiber optic cables) (Nagpur Mihan)

• Two, four, and six lane roads. 51 km total internal length of roads (Nagpur Mihan)

• Own power plant, due to erratic power supply issues ("From manufacturing to logistics")

• Connections to major road/rail networks ("Nagpur Logistics")

Despite these ambitious plans, some say the end result of the project will be disappointing. Rather than being along the lines of Singapore or Shanghai, the end result could be much smaller ("Relief promised for displaced"). This project is very similar to the plans for a new airport in Pune in how problems continue to surface and delay progress. Initial project completion projections are rarely met, and setbacks in the project are a regular occurrence. During 2010, the project faced the following problems:

• Deccan-360, a cargo company with a hub connecting Nagpur to 15 cities by air and 50 cities via road, suspended operations (Dravekar) (A report in February 2011 announced that Deccan-360 planned to use Nagpur as a hub, without mentioning suspension of service ("Nagpur Logistics")).

• India Post suspended its night airmail service in May 2010. It used Nagpur’s airport as a hub for domestic speed post, mail, and parcels (Dravekar).

• Air India canceled plans to use Nagpur as a freight aircraft hub to 6 cities, and decided to dispose of the planes acquired to run that service (Dravekar).

• A high speed passenger rail line between Mumbai and Nagpur was not included in a list of projects selected for pre-feasibility studies (Pinjarkar). While this is a passenger rail line, it falls into the overall intermodal concept and overall growth goal.
The project has also faced a lack of positive response from the relevant industries:

- A late 2010/early 2011 survey by the Indian Council for Research on International Economic Relations and the Indian Institute of Management found most logistics companies are not interested in a hub at Nagpur ("Nagpur logistics").

- The potential or actual volume of traffic is a deciding factor on locations for hubs, and Nagpur does not meet the criteria ("Nagpur logistics").

- The Express Delivery Council, which has common-user facilities in Delhi and Mumbai, has not expressed interest in setting up a facility in Nagpur ("Nagpur logistics").

- The associated special economic zone, which has existed for eight years, only had one company operating in June 2010. Sixty-two companies purchased land in the project, but other companies had not yet made decisions on their investments at this point. This could point to a lack of initiative by the Maharashtra Airport Development Company in following-up with potential tenants ("8 yrs on").

Despite these setbacks, local officials maintain that developments are moving forward. In late January 2011, it was announced that Boeing would begin setting up its projects soon ("TCS and Boeing"). Boeing projects at Nagpur include maintenance, repair, and overhaul facilities ("Boeing MRO at Nagpur"). Also in January 2011, Dr Sanjay Mukherjee, the chairman of the project, said they were focusing on private-public partnership developments on the outside of the city to facilitate overall growth of the city ("TCS and Boeing").

Christoph Remund, CEO of DHL Lemuir Logistics, India says the volume of traffic determines where hubs are located. Currently, most traffic is bound for major metropolitan areas, increasing time in transit. Remund says the Nagpur facility would be beneficial for companies that handle cargo actually bound for Nagpur. Because Nagpur is not a major
destination, the success of the hub would be largely contingent on the success of the attached special economic zone. Additionally, Gautam Nath, CEO of DPD Continental, said the quality of roads connecting Nagpur and major cities would need to be improved in order to make Nagpur's use as a hub feasible. He also said border checkpoints would need to be removed in order to allow for efficient flow of goods to and from the Nagpur facility ("Nagpur Multimodal Hub Skepticism").

However, sending cargo through a hub at Nagpur would not be practical for cargo which originates in and is and bound for major metropolitan areas. Mahendra Agarwal, managing director of Gati, an express cargo operator, says Nagpur would only be used where volumes do not justify point-to-point flights. Point-to-point flights are more cost effective when there are sufficient volumes between two cities, and this arrangement reduces the chances of damage and loss of goods. Despite this possibility, Tushar Jani, chairman of Cargo Service Center, said most cargo traffic movements are from South to North and West to East. Traffic in the other direction is not in equal proportion, making a hub in Nagpur have no benefits. When hubs are used, ideally they are in locations with significant origin/destination volumes. Without a successful special economic zone, Nagpur would not have volumes of a significant enough level ("Nagpur Multimodal Hub Skepticism").

Additionally, with the growth India is experiencing, it is likely that multiple logistics companies will need to have hubs in different locations ("Mihan is here to stay"). Therefore, a hub of the scale of the Nagpur project might not attract the high level of volume it is designed to handle.

Other multimodal projects

While the Nagpur intermodal project, like many projects in India, has been slow to get off the ground, there are many examples throughout the world of successful intermodal hub projects as well as projects under development with direct stakeholder involvement.
Intermodal transportation is beneficial because it allows shippers to utilize the speed of air transport when necessary, but to utilize less expensive methods (such as rail or truck) for feasible parts of the shipment’s journey. Utilizing intermodal transportation can cost half the cost of air freight alone, yet move much faster than if only surface transportation were utilized (Gooley). Additionally, providing additional modes of transportation can help ease congestion problems present in other modes.

**Euro Carex**

Initiatives have been underway in Europe to divert cargo from feeder flights and trucks to high-speed rail to ease congestion at airports and on roads, and to address environmental concerns associated with air and road transportation. Euro-Carex, an initiative supported by Fedex, Air France Cargo, La Poste (France’s postal service), TNT, UPS, and SNCF (France’s national rail operator) (“Taking Europe’s Air Cargo”), hopes to link Paris’ Roissy (Charles de Gaulle) Airport with Lyon, Amsterdam, Liege, and London by 2015. The group hopes to expand service to Frankfurt, Strasbourg, Bordeaux, and Marseille by 2018 and Italy, Spain, and further into Germany by 2020 (Euro Carex). The fact that so many different companies are involved in this initiative again shows the importance of buy-in from the relevant stakeholders. This is something these companies see as a need and are willing to invest in it. Rather than being built and hoping people will utilize these facilities, they are being developed with the direct participation of the firms that will be utilizing them.

Carex trains are currently under development, and will possibly be loaded with air cargo containers. This will allow the containers to be taken right off the airplane and put directly onto the train with no processing necessary between the two modes. The interiors of the trains will be fitted with roller systems to facilitate movement of the containers, just as aircraft currently are. Each train will be able to carry 120 tons of freight, which is equivalent
to one Boeing 747-400 cargo, one MD-11 cargo, three Airbus A310 cargo, seven Boeing 737 cargo, or six to seven trucks (Euro Carex).

Carex terminals, which are currently being designed, will be designed to accommodate the transfer air freight containers and pallets onto the high speed trains. The group plans for these terminals to consist of:

- Four tracks, each flanked by two 400 meter platforms
- Platform width of up to 20 meters to support tractor-drawn “dollies,” if needed
- Storage for empty containers and less urgent freight awaiting dispatch
- Truck receiving terminal
- High density, secure road directly connecting airport facility and railport
- Customs clearing facilities
- Private Road Access Inspection and Filtering Station (security check for incoming freight)

(Euro Carex).

**Frankfurt, Germany: Cargo City South:**

The Frankfurt Cargo City South project was developed with the goal of reducing pollution and congestion by moving cargo that would otherwise continue by air onto trains (“Gooley”). This station is currently not in use but could be used for the Euro-Carex project (Euro Carex).

**Leipzig/Halle facility**

While the current status of the project is unclear, according to a December 2009 Payload Asia article, German air freight carrier DHL was involved in a project to develop a service called “Air Cargo Express,” estimated to launch around 2015. Air Cargo Express would initially connect the Leipzig/Halle airport with DHL’s Frankfurt airport facility and in later stage Hamburg, Munich, and Dusseldorf’s airports. In December 2009, the airport had
already built an on-site freight train facility and was testing it. Dierck Nitther, the managing
director of Leipzig/Halle airport, explained how the airport wanted to turn itself into a tri-
modal hub, rather than a “belly” hub such as Frankfurt (where freight is focused primarily on
airplanes). They built the rail freight station early on to make the idea more of a reality from
the beginning. Nither said it was clear that industry partnerships would be key, and DHL was
committed to the project from the start. As of December 2009, the airport was working on
forming partnerships to operate the train service, and recruiting “co-loading” customers
(including non-air freight) to utilize any excess capacity DHL does not need (“Taking
Europe’s Air Cargo”).

The Leipzig/Halle airport also entered into a partnership with its primary ground
services company, PortGround Aircraft Handling Services, to develop and promote the
airport’s capacity to handle incoming and outgoing shipments and associated transfers
between aircraft and trucks. (“Portground RFS Network”)

Features of the facility include:

- “More than 8,000 square meter warehouse space within the airport security area
- Direct access to cargo apron
- State of the art equipment and vehicles
- Integrated cargo duty office for documentation
- Parking space for trucks and transporters
- Diverse special storage facilities (VAL/VUN, HUM, ICE, COOL, DGR)
- Located next to customs office
- 24/7 operation”

(“Portground RFS Network”)
Additionally, the airport’s trucking service offers the following services:

- **Outbound:**
  - Daily co-loading, any destination in Europe (for loose cargo)
  - Daily rollerbed truck connections (for aircraft unit load device cargo), any destination in Europe
  - To-door services to destinations in Germany, Poland, and Czech Republic

- **Inbound:**
  - Scheduled overnight service from any Germany destination
  - Service from any European destination upon request

(“Portground RFS Network”)

**Intermodal Applications to Pune**

I believe there is potential for Pune to develop into an international air cargo hub due to its proximity to Mumbai. It could be especially promising for handling excess capacity as a hub both as a reliever for current congestion in Mumbai, and for new entrants to the market who could not be able to base their operations at Mumbai. Pune is well-connected to Mumbai through the Mumbai-Pune expressway.

Elements of the successful intermodal hubs could be implemented at Pune. When developments of this type are considered, planners must decide whether they want to follow a revenue model or a development model. Under a revenue model, projects are built to satisfy current demand and result in revenue. Under the growth model, the government provides subsidies to help the project, hoping that the project will stimulate economic development (“Multi-modal airports”). This “if you build it they will come” philosophy seems to be how MIHAN has been approached. Dr. R.C. Sinha, director of the MIHAN, project, says that MIHAN cannot be replicated everywhere because not every area has the potential to drive growth.
Potential for a region’s growth is a combination of a kickstart and a natural, organic growth that may already be brewing in the region over time. If the government wants private players to participate in airports, it must make the projects profitable and viable. That would be the realistic approach to take. Even more important is that it should use a case-by-case basis to evaluate multi-modal airport projects and not run into a one-model-fits-all approach ("Multi-modal airports").

Based on the difficulties faced in getting these types of projects off the ground (evidenced by both MIHAN and the development of a new Pune airport), I question whether any area can assume that it has the potential to drive growth (like Nagpur) without working with supply chain partners to gauge interest in using the area to help strengthen the supply chain. The Nagpur project is being developed and there seems to be relatively little interest among supply chain firms. I believe these types of developments should be developed at a sustainable scale, based on the needs of supply chain firms in the foreseeable future. However, it would be wise to build facilities that are expandable to meet additional demand should further growth occur. Therefore, it is very important to integrate potential supply chain partners into plans while they are being developed. If supply chain partners (airlines, freight forwarders, warehouse operators, prospective special economic zone tenants etc.) were fully integrated into the plans from the beginning, it is likely that the industry’s needs would be more apparent from the beginning, and a project could be put together that meets the needs of all of these firms. The airport and facilities would be developed to the level of demand (and allow for future expansion when needed), preventing the project from becoming of such a large scale that it could not be afforded. Having facilities that meet the supply chain’s current needs and planning for future growth will allow the economy to reach its full current potential and smoothly grow into the future.
Shafran and Strauss-Weider give a number of recommendations for how municipalities can consider existing hub access requirements into transportation planning (i.e. building of roads, etc.) This framework can also be applied, with some variation, to planning of an intermodal hub facility itself because it involves carriers and development planners. I will explain these recommendations, and make comments about related issues specific to Pune on a number of these steps.

1. “Analyze existing conditions and historical development” (64-65)

This step involves developing a summary of the current state of the freight industry in the area and an “understanding of the role of the intermodal facilities and cargo hubs in the area, the hubs’ major carriers and support functions, and their competitiveness.” In the case of Pune, the authorities would need to look at all of the freight transportation operations in the region, including air, truck, and rail. They would probably want to focus more on current needs of trucking and rail carriers, and survey potential air freight users to learn more about their needs. At this step, they would also want to analyze the Nagpur development, and learn from the successes and failures during the development of that project. Additionally, the group should analyze the performance of the local rail and truck facilities to determine what can be improved to facilitate more efficient operations, particularly in an intermodal sense. Additionally, analyzing other Indian air freight facilities (such as Mumbai) and the problems associated with it (congestion, lack of space, etc.) would be recommended. Financial approaches should also be examined in this step.
2. **Study the existing problems or issues and propose solutions (66)**

This step is especially important in Pune, because there are so many existing constraints that affect carriers. At this step, the planners should work with carriers to determine:

a. What existing constraints they are facing

b. What their needs would be for capacity and facility features. A particular focus here would be how a facility could facilitate integration among the three modes of transportation.

c. Develop a report on the carriers’ current requirements for an ideal facility and future requirements of what would be required of that facility. Apply these findings to step two.

3. **Develop demand projections (65-66)**

At this stage, planners would first want to analyze the area’s development goals and options. Then, they should analyze the competitive position of other area facilities (i.e. Mumbai, Nagpur, etc.) as well as carrier expansion plans and “competitor” terminal development/expansion plans. A carrier’s expansion plans under the current scenario might be much different than they would be under current infrastructure conditions. After estimating demand for a new facility, planners should also plan accordingly for facility access and capacity in order to reduce the chance for congestion. Studying other facilities and their problems (and potential resolutions) could also be helpful.

4. **Project selection criteria/methodology (66)**

The National Cooperative Highway Research Program report states that, at this step in urban planning, it is important to determine “project selection criteria explicitly and formally include measures that reflect the structure of the area’s cargo
hub facilities and the important needs of its major carriers” (66). In planning for an actual hub itself, it is important that specifications for the development be explicitly laid out, and that stakeholders be consulted to ensure all their needs would be met.

Some things to consider are:

a. Airport location. Because airplanes can only access airports, and the location of an airport cannot be easily changed, this is the most constraining factor. Roads can be built and rail tracks laid much more easily than building a new airport. This could particularly complicate the situation in Pune, as the development process for a new airport is dragging on and on. Because of this, the director of Pune’s airport said planning must be made for the existing facility, as the new airport does not seem to be coming to fruition. Planners would need to work with the planners of the new airport and become integral in pushing the airport project forward, or determine if the current airport can meet the needs of carriers and the new facility. Alternatively, they could make larger scale plans for the new airport and implement them on a smaller scale temporarily at the current airport.

b. Rail access: If there is not currently rail access to the airport location, planners would need to arrange to have track allowing for the appropriate amount of capacity to be laid. In the case of a new airport development, the intermodal facility planners could work with the airport planners to work this into the airport’s master plan.

c. Truck access: If sufficient roads do not currently exist, planners would need to arrange to build roads allowing for the appropriate weight and volume of trucks to access the facility. As with rail access, in the case of a new airport
development, the intermodal facility planners could work with the airport
planners to work this into the airport’s master plan.

d. Facility features requirements: Determining specifications for facility features
would be based on industry “best practices” and the carrier needs identified
previously in the process.

c. Cost constraints

5. **Develop alternative system strategies and select an alternative** (66)

This step would involve developing different plan possibilities for the hub. In
Pune in particular, there would be a number of variations of this plan, including the
following factors:

a. Location (plan for new airport, plan for old airport, or plan for both)
   i. Specific location of airport and its cargo facilities

b. Capacity levels

c. Combination of features (sorting equipment, ULD loaders, warehouses, office
   space, etc.)

How the needs and priorities identified are addressed should be explicitly
identified within the alternative plans

6. **Evaluate alternatives and recommend a preferred alternative** (66)

Evaluate how well each project meets the evaluation criteria in step four.

Selection should also take into account how each of the alternatives meets the overall
economic goals of the area

7. **Select strategies for implementation** (66-67)

At this stage, planners should draft a recommended plan and present it to all
stakeholders, and then revise the plan if needed.
Summary of recommendations

In summary, the transportation planning process should incorporate the perspective of cargo hub access needs explicitly and formally in all steps. Data gathering, analysis of the current situation, identification of problems and solutions, criteria to select projects and initiatives that address the identified needs, and evaluation of alternatives should all be carried out to ensure that cargo hub access needs are adequately considered in the technical analysis and methodologies used. Similarly, the policy committee, technical committee structure, public participation process, and other mechanisms to gain input from various stakeholders and community representatives should be set up so as to incorporate representation from key cargo hub operators, carriers, and major shippers in the area. Special efforts (e.g., information meetings, focus groups, or workshops) to involve operators, carriers, and shippers should be added to ensure that the cargo hub access perspective, needs, and priorities are acknowledged throughout the process responsible for defining transportation needs and selecting the recommended approach to meet those needs.

Conclusion

In conclusion, Pune is a city that has a lot of potential for improving its air cargo infrastructure. Doing so could facilitate a lot of growth for the region, especially if multiple modes are combined into one facility. With the current infrastructure that is in place, the region’s economy will not reach its full potential. There are a number of ways the area could proceed to improve the infrastructure.

1. Form a task force, made up of current airport administrators, new airport development representatives, government representatives, and logistics industry representatives (carriers of a number of different modes, logistics services companies, etc.) It could also be wise to include representatives from local businesses that currently ship high volumes, or would if there was better access to freight services.
2. Determine whether to proceed with a project at the current airport, future airport, or both. This would be based on the development timeframe for a new airport, and whether those plans are likely to ever come to fruition.

3. By working as a group, gain opinions and encourage buy-in from all the interested parties. Set up a plan that would benefit all stakeholders in terms of
   a. Air cargo facility capacity and location
   b. Rail/truck facility: determine if integrated facilities would be beneficial, and, if so, location and connections to infrastructure (train lines, major highways, etc.)
   c. Warehouse capacities and locations
   d. Integrated air freight station locations
   e. Project time-frame and commitment to following it
   f. Financing of the project, including a determination of whether a revenue model or growth model would be followed.
      i. I recommend a combination of revenue model and growth model. If a growth model is strictly followed, there is less incentive to get buy-in from the industry and from potential users of the new infrastructure. However, if a revenue model is strictly followed, it might not be possible to raise the needed amount of capital because the firms are unwilling to take that big of a risk, or because the projected return on the firms’ investments is not attractive enough. Therefore, the government could provide subsidies as part of a growth initiative to complement the investment that is already being made by the industry.

Undertaking such a project will provide a number of benefits, both to the area’s economy and to the individual business affected by the project.
Economic Development:

a. Additional incentive for businesses to locate in the Pune area. Access to air freight stations and the close proximity of an international air hub can spur development in a number of industries that produce products that are distributed domestically or internationally. For example, cities such as St. Louis, Indianapolis, and Kansas City have all been able to attract logistics operations thanks to their superior infrastructure compared to cities they were competing with (Biederman). An intermodal hub would increase Pune’s advantages, as multiple mode transportation could result in a better balance of the needs for transit speed and cost reduction. Locating a hub also in turn leads to attracting additional businesses, such as manufacturers who wish to be close to a worldwide shipping location (Biederman).

b. Additional job opportunities, in the construction and operation of the facilities and the businesses that the new capabilities enable and attract new businesses because of these improved capabilities.

c. Increased global competitiveness due to improved logistics connectivity

d. India’s Prime Minister is trying to increase manufacturing from 17 percent of the economy to 22 percent. Having access to this kind of transportation infrastructure to facilitate trade can help in achieving this (Dhara).

e. India is open to development of special economic zones. Mahindra and Mahindra set up one for electronic hardware manufacturing and hardware-related research and development. Having access to a good transportation infrastructure is likely to fuel increased interest in SEZs in the Pune area.
Impact on business:

a. Being located close to a logistics hub can result in reduced logistics costs for businesses. Reducing logistics costs can have a direct effect on a business’ profits. Deloitte Touche Tomatsu in 2008 estimated “that companies must tack up to 5 percent onto the costs of doing business in India due to well-worn infrastructure.” (Cross).

b. Having good infrastructure can make doing business just plain easier. Logistics improvements “can’t happen soon enough for Hyundai Motor, Nokia, Dell, SemIndia, and the other companies that aligned early on with India to move its manufacturing capabilities forward (Cross).

c. The improved logistics coordination (air freight stations, off-site shipment processing, coordination between modes) can reduce costs even further

d. Being well-connected to other major metropolitan areas can extend these effects to businesses in other areas of the country as well

e. For all states in India, improvements in physical infrastructure have had a positive effect on output from the secondary sector. Therefore, improved infrastructure can help companies in the secondary sector to be more successful (Ghosh).

f. A reliable logistics system can help with implantation of a “just-in-time” system. According to Robert Lieb, Ph.D., a professor of supply chain management at Northeastern University, “If you’re trying to run a lean manufacturing operation, you will back up your production process with a lot of safety stock, which will make operating costs go up. In many cities, when production volume goes up, you have several hours every day of gridlock” (Cross).
Works Cited


<http://www.businessweek.com/magazine/content/10_49/b4206016219076.htm?channel=magazine+channel_news+global+economics>.


"Nagpur logistics: sweet or sour orange? Millions are being spent on new airfreight facilities in the very heart of India. Yet many analysts believe that despite congestion, existing hubs are a better bet." Air Cargo World 100.3 (2010): 24+. General OneFile. Web. 17 Feb. 2011.


Page, Paul. "Trading Hong Kong: Hong Kong has a high-gloss logistics strategy to go with its gleaming airport, but cargo competition is uncomfortably close. (Feature Focus:


