Evaluating Airline-Transit Cooperation in Airport Rail and Remote Check-In Services: A Strategic Approach for Increased Ridership

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ABSTRACT

This thesis applies Lean Principles and Practices to the public transportation services sector. It is an innovative approach since the area of knowledge is most actively used in the production and manufacturing field. Other theories, Stakeholder Theory, Systems Theory, and Transaction Cost Economics, have been incorporated to complement lean thinking and create a strategic management framework for studying airport rail and remote check-in (ARRCI) systems as enterprises. The purpose of using lean and elements of these research areas is to better understand the relationship between two critical and most salient stakeholders, airlines and ARRCI operators. The underlying hypothesis is if the values and vision of these two stakeholders are aligned, then performance improves as the friction impacting the cooperation is structural waste eliminated.

The framework for analyzing ARRCI systems is mostly lean thinking. An original development in this thesis is the integration of transaction cost economics to the lean methodology allowing a better comprehension of the interactions between airlines and rail service operators. The new association was applied to three ARRCI cases. Together they provide a source of experiences which should be considered as examples for new systems in the future. Several important observations and conclusions, an analytical framework for understanding airport rail systems in general, and recommendations were derived using the approach demonstrating its advantages and capabilities.

Public/private ventures to create ARRCI systems are under development in United States’ cities and elsewhere. The public interest is clearly defined, with social benefits justifying this policy. What remains, and is pursued here, is the identification of the benefits for the airlines involved since their active participation is important for successful implementation, and their passengers are the end users of the service.

Thesis Supervisor: Frederick P. Salvucci
Title: Senior Lecturer, Massachusetts Institute of Technology
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To Dad, Mom, Lee, Lorena and my loved ones, whose support and love has been there always. And to my loyal fish Lorenzo, who silently observed as I worked day and night.
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Section I: Beginnings

CHAPTER 1 – Introduction

In 1998 the British Airports Authority (BAA, Plc.) inaugurated what became a benchmark for modern and seamless ground access services to major metropolitan airports worldwide, the London Heathrow Express. The service was comprised of a high-speed, dedicated link connecting Paddington Station with London Heathrow Airport in a record time of less than twenty minutes and a downtown station with service for passengers to check their luggage to their final destination or pick it up upon arriving to the city. The convenience for passengers within the vicinity of Paddington was – and is – superb. But the cost of the project was nearly half a billion UK Pounds, covered mostly by the private operator BAA; and to date, the operating revenues have not sufficed to recover the capital investment or even been enough to cover ordinary operating costs.

Shortly afterwards, cities across Europe and Asia followed the initiative by improving or creating dedicated rail services to their large metropolitan airports with check-in services in downtown districts and other locations. In Europe, for example, Germany’s AirRail connects Frankfurt Airport with the downtowns of Stuttgart and Cologne, and Spain’s Metro de Madrid Línea 8 subway extension takes passengers from Madrid’s business district to Barajas Airport. The project costs and operating revenues dilemma also haunts these services just as is the case of London. However, justifications for these services exist and have included environmental needs, such as Stockholm’s Arlanda Express; geographic constraints, as the Japanese airport island of Osaka/Kansai; and even political leverage, as was the case for a London Gatwick and a Stansted Express enabling BAA to proceed with a third runway at Heathrow Airport.
As Europe developed convenient airport to downtown rail services, with convenient stations in airport terminals, and high frequency/high speed rail to convenient central stations with check-in capacity in places as Brussels, Zurich and Amsterdam, the U.S. generally lagged behind. The United States today has no such facilities. Some cities understand the importance of possessing these public services to address problems as space limitation, road congestion, and other community concerns. However, only Chicago, Washington, D.C. and Atlanta have in-terminal presence of metro services and nothing more. At present, Chicago is the first to consider the novel product as the region steadily prepares to expand its massive O’Hare International Airport, one of the Nation’s most important transportation hubs. In this effort, significant consideration is being given to the ground access and public transit component, with a proposal to enhance the existing connection of the city’s downtown business district, or “Loop”, with O’Hare and Chicago’s other major airport, Midway. An alternate non-stop fast train service with remote check-in facilities, known as the Chicago Airport Express, is being viewed as a step toward a more convenient and reliable service, similar to the most advanced and renown systems around the world.

In this study, these dedicated airport/downtown rail systems briefly described are termed Airport Rail and Remote Check-In (ARRCI) services, and though they are great examples of a seamless collaboration and interface between transportation modes and agencies, serious problems exist. A reason for this is the organizational complexity of the task at hand. Airport rail and remote check-in systems require many groups working closely and efficiently to succeed, both during the planning stages and in later day-to-day operations. In the simplest form, key players include the airport operator (providing one end of the service and the link between the airplane and the train), the rail operator (serving the en-route connection), the rail station in downtown (providing the other end of the service and the first or last contact for the passenger), federal inspection services (if the product serves international passengers), and of course, the passenger using the system. At the same time, another important group must be considered when devising ARRCI systems. Passengers use airport/rail services to go and come
from airports, for multiple reasons (to travel, pick up or drop off travelers, work, deliver, etc.), but the main feature about being at an airport is that all business there is related to the airlines serving the facility. Hence, the end-users of the ARRCI system (i.e. the traveling public), are all closely related to the airlines for one reason or another.

Synchronizing these groups to all collaborate and gain benefits is, indeed, a daunting task. As a consequence, airport/rail connections with or without remote check-in services have varying, but overall low passenger utilization numbers, especially in the United States. A look at the Transit Cooperative Research Program’s Report 62 demonstrates this fact and raises questions for planners as to why the trend exists (see Figure 1 and Figure 2). Nevertheless, the planning and operational difficulties are one side of the problem. From the user’s perspective a more disturbing reality is that some airport/rail connections do not even have the “seamless interface” common in most European and Asian cities. This is particularly true of the U.S. airport/rail scenario.

Figure 1: Public Transportation Market Share at Large U.S. Airports
At first, the low results can be attributed to poor service architecture and less-than-critical mass of passengers at the interface platforms of the downtown station and the airport. This is most notorious in the United States where major environmental characteristics affecting airport rail services generally include:

- Small proportion of passengers ending their travel in downtown areas
- Demographics and population densities in urban areas
- Suburbanization of the U.S. landscape
- Little familiarity with transit systems and preference for the automobile
- Low frequency and deterioration of service
- Level of convenience at airport and non-airport stations
- Rules and types of business arrangements that airport operators establish to control and manage ground transportation operations

Further inquiry into ARRCI services across the globe reveals another fact however: That daunting task of synchronizing efforts among all the groups involved, and particularly the most important groups, is inhibiting the desired results simply because the task is not being fulfilled. Airport operators plan their services only to their departure and arrival roads, transit or rail operators assume all responsibilities from outside the airport to downtown, downtown stations are planned as multimodal islands without reasonable interface with everything else, and the airlines simply worry about their passengers once these reach their check-in counters. The main reason behind this chaos seems that the groups believe there is no benefit attained from working together. In other words, they think modally to satisfy their individual needs without realizing that they all add to the consumer's ultimate desire – to mobilize from one place to another.

This thesis proposes that all the relevant groups taking part in an ARRCI system must work closely from the early planning stages to the day-to-day operating life of the service. It further emphasizes the critical need to include specific groups (airlines, airports, rail operators, and station operators) since they are essential component in the airport rail and remote check-in enterprise. The logic supporting this belief is provided in Section II of this work with Lean Principles and Practices, Systems Theory, Transaction Cost Economics, and Stakeholder Theory, all schools of thought helping evaluate the strategic planning of complex systems with many parties, or stakeholders. A stakeholder, as defined in Chapter 5, is any group affected or being affected by the system in place. Hence, airlines, airports, rail operators, station owners and operators, communities, and the traveling public are just some of the stakeholders of an ARRCI service.
To illustrate the need to include all stakeholders, and especially key stakeholders, three specific cases are carefully reviewed in Section III: London’s Heathrow Express, Germany’s AiRail, and Madrid’s Línea 8. The reasons for their selection include:

- Their prominent reputation within the industry
- They constitute a taxonomy of types of airport-rail links most commonly found around the world today
- Access to available materials, information and resources to complete the study
- Demographic and income similarities with the United States

Each case serves as an example of the complex relationships between airports, rail operators, downtown stations, the traveling public, and especially the role of airlines in ARRCI products. The relationships are guided by individual and common goals affecting the venture. Therefore the relationships of these and other stakeholders mold the airport rail and remote check-in architecture (both physically and institutionally) and encompass the complexities of the framework wanting to satisfy their individual needs and expectations, but still attempting to produce value for an end user.

Section IV of this research assesses the ARRCI cases reviewed in order to determine commonalities and differences helpful to planners of future services in the United States and elsewhere. This is done using the Enterprise Value Stream Mapping Analysis (EVSMA), a tool useful in evaluating complex systems, their stakeholders and their relationships. The results are then applied to the U.S. scenario, taking one of the country’s current ARRCI proposals, the Chicago Airport Express. In the end, many points will be clear to the reader. Yet the most prominent of these is that all groups – together – must remember that the ultimate goal of transport service is to move people and goods from one place to another conveniently. And for a person or good to reach a final destination conveniently, seamless intermodal connections are required and can only be provided when modal collaboration exists.
CHAPTER 2 - Methodology

This work reviews how three European airport rail and remote check-in (ARRCI) services are performing today. The study presents an approach to planning public transportation to airports, emphasizing that airlines must be included in the early stages of the planning process if the effort is to include successful remote check-in services. The methodology consists of an exploratory research of three case studies (the London Heathrow Express, Germany’s AiRail, and Metro de Madrid’s Línea 8 subway connection), comparing their performance through time as well as their unique historic settings. In a sense, the project is a benchmarking effort seeking the best practices for future systems. However, it does not specify which of the cases is an industry standard planners should follow. Instead, the thesis illustrates their distinctive and common attributes extracting useful knowledge which could be transferred to strategists and planners in upcoming projects.

To accomplish this guide to best practices, the method combines the effectiveness and objectivity of benchmarking with the systematic and broad approach of lean principles and practices. Basic data from the cases is observed and measured, as would normally occur in a benchmarking study. But the analysis and end-results are attained using the Enterprise Value Stream Mapping Analysis, a tool extending the prevailing view of lean production as a framework for enterprise improvement and realization and which must consider all measures instead of just a few (see Figure 3). Lean thinking has seldom been applied to the transportation services sector and the EVSMA usage in this area is a first. For this reason, the methodology is modified later on to fit the research’s needs.
A Case for Benchmarking

Managers and policy makers often need to compare their operations or initiatives with another operation or initiative to see the results achieved. They do this by comparing vis-à-vis their own with the best in the class since that best sets a standard for expected performance. This process is known as benchmarking. The U.S. General Accounting Office's exact definition is:

"Benchmarking is a structured approach for identifying the best practices from industry and government, and comparing and adapting them to the organization's operations. Such an approach is aimed at identifying more efficient and effective processes for achieving intended results, and suggesting ambitious goals for program output, product/service quality, and process improvement."

the measures, collecting them from the sample in question, and finally analyzing them and ranking the operations or initiatives (De Neufville & Rojas Guzmán, 1998). This seldom produces definitive answers or explanations for the differences observed. However, it enables the managers and policy makers to focus and sharpen their investigation seeking improvement (Kaplan, 2001).

The benchmarking element of this research consists of three specific cases from where objective data is obtained for further analysis under the EVSMA. The cases considered for illustrating the approach throughout the research are London’s Heathrow Express, Germany’s AiRail, and Madrid’s Línea 8. The reasons for their selection are:

- Their prominent reputation within the industry
- They constitute a taxonomy of types of airport-rail links
- Availability to relevant data
- Geopolitical similarities with the United States
- Market and demographic similarities with the United States

Past airport ground access studies such as TCRP-62 and Air Rail Links: Guide to Best Practices have focused on the financial and service provision measures of systems everywhere (regardless of their location) to evaluate their performance. They make some reference to the geopolitical and market and demographic elements, but barely enough. Contrarily, this thesis looks at those two elements through the historical development of each system and the current organizational and operational environment in which they work today. The reasoning for this is that by systematically viewing the historic developments leading to the current organizational and operational environment, one can better understand the impact this has on the two most critical measures which define ARRCI system success: market share and airline service utilization. And eventually, both market share and airline utilization determine the ultimate standard, customer satisfaction, which may be partially captured as operating revenues.
The Enterprise Value Stream Mapping Analysis

*Lean Thinking* consists of defining value for the end customer and identifying the value stream involved in delivering that customer value. The value stream consists of a series of steps and processes the stakeholders of an enterprise must perform in order to produce a good or service for a customer. Lean, as discussed in Section II, first emerged in the product manufacturing sector—specifically the automotive industry in Japan—then extending to industry wide practice, and beyond the automobile world into areas such as aerospace, computers and telecommunications. Value-creation, as presented in the book *The Machine That Changed The World*, constitutes the enterprise value stream. But unlike traditional value streams or value chain models, the lean value stream process is more general. It integrates multiple processes as well as multiple stakeholders. It covers not only the product life cycle processes, but also the support functions and the executive/leadership functions. Chapter 3 explains the basics of lean in further detail.

Understanding and creating value for stakeholders is a critical aspect of being a lean enterprise (Murman, et al., 2002). Therefore, methodologies to realizing this have become the key framework of many large ventures. One of these methods is the Enterprise Value Stream Mapping Analysis (EVSMA), a recent tool developed by researchers at MIT’s Lean Aerospace Initiative\(^2\) for diagnosing and improving the performance of systems. It does this through eight phases illustrated on the following page:

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\(^2\) The Lean Aerospace Initiative is a partnership between industry, government, labor, and academia created in 1993 to help transform the U.S. Aerospace Enterprise. The effort was launched in response to the challenges the industry faced with rising costs in the United States. LAI parts from the founding works of a previous five-year research initiative at MIT, the International Motor Vehicle Program (IMVP). More information will be provided in Chapter 3.
1: EVSMA Set-Up
Provide motivation for the team as well as outlining roles and responsibilities through a team charter. Ensure the team is knowledgeable and prepared for the analysis in the following phases.

2: Stakeholder Value Exchange
Identify the enterprise stakeholders, their contributions to the enterprise and what value they expect to be delivered in return. Identify the relative importance of each stakeholder value to the enterprise and how the enterprise is delivering on that value.

3: Strategic Objectives
Identify and quantify the strategic objectives for the enterprise.

4: Enterprise Processes
Define the enterprise processes specific to the enterprise being analyzed.

5: Enterprise Interactions
Assess flow in the enterprise by looking at the interactions among processes and stakeholders.

6: Enterprise Waste
Identify enterprise level waste in the current state of the enterprise.

7: Future State
Create a vision for how the enterprise should look and behave two to three years into the future.

8: Improvement Plan
Prepare a plan for closing the gaps that exist between the current state and future state by prioritizing opportunities for improvement.

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The EVSMA is intended for evaluating existing systems, suggesting a timeline for implementation as noted vertically in the previous figure. Consequently, applying this tool to the airport rail and remote check-in scenario requires some creative adjustments and changes to the steps themselves and their deliverables, and also modifications to the time frames necessary for the analysis. The resulting variant of the tool can then evaluate and extract those elements most useful in the existing services while setting some guidelines for future developments.

**Justification**

The benchmarking component of the study consists of gathering and prioritizing available basic data in each case through a standard approach. This systemized method then permits an objective comparison of the services which will be done using the EVSMA (see Figure 4). The attractiveness of the Enterprise Value Stream Mapping Analysis lies in its ability to identify the enterprise value while helping establish the multiple interrelations among all the parties involved in the endeavor, two fundamental notions of lean analysis. Once complete, the stakeholders will better understand how the enterprise relates to their objectives and what benefits will the project provide them, making value delivery a more clear and natural process. If, on the contrary, the results prove that there is no benefit to all the stakeholders, there must be a mission reassessment and how this new mission can be achieved.

Benchmarking is a popular approach in many fields. Works of this sort include studies of best practices in public administration and scientific research (106th Congress, 2000), management practices (Axson, 2003), and even at macro-scales such as national competitiveness and economic growth (Hämäläinen, 2002). Airport rail systems, as was first described in the previous chapter, have also been the subject to previous benchmarking efforts. Lean thinking, however, is a different case. Most efforts have concentrated on the development and production sector, with very few examples in the services world. Therefore, ground access services to airports as evaluated through lean analysis, and specifically with the EVSMA microscope, is a new approach on the subject. And though there are many differences between
an ARRCI service and a manufactured good, the following commonalities from both enterprises support the approach:

- ARRCI services and the manufacturing of a product, from a microprocessor to a satellite, are systems comprised of an agglomeration of many institutions each providing information, materials, and resources throughout the entire life of the product, from planning to operations to delivery to system upgrades.

- If non-existent, both services and products can begin as public/private ventures in order to develop expensive infrastructures (including the fixed and mobile components and the organizational setup). Later on, operations and upgrades will depend on what was initially created and any adjustments will require significant investments which may again involve both the public and private sectors.

- The initial planning and design, as noted in Section III, strongly defines the entire project. Therefore, because planning requires multiple parties for the execution, communication processes are complicated and unique as they define the business/policy strategy that will lead the enterprise to succeed.

The benchmarking technique with EVSMA in this thesis does not "improve the performance of the ARRCI systems reviewed". Rather, the methodology provides a series of observations and points useful to business planners and policy makers considering such an endeavor, especially in the United States. The experiences of the three existing systems analyzed are a used as a source of knowledge and information. Taking advantage of them will enable positive gains throughout the entire industry. The procedure described attempts to accomplish that, providing some insight for creating sustainable operations and services in new venues in the future.
This chapter explains the lean thinking mentality along with some of its fundamental concepts, principles, and practices. Further observations describing where lean thinking is complemented by systems theory and transaction cost economics are also presented. The chapter concludes with a proposition as to how lean production can be applied to public transportation, serving as interesting insight to combining theory and practice later in this research.

Lean Thinking

Lean thinking came about as a response to the needs of Japanese auto maker Toyota shortly after the Second World War. With little resources in what was left of the devastated country, the company searched for a way to produce many models in small quantities in order to rival the mass production giants of the United States (Ford Motor Company, General Motors, and Chrysler Corporation) that were dominating the market. These efforts were based on the fact that Toyota could not sustain a competitive position with the industry’s traditional mass production concepts. What resulted was the Toyota Production System, a completely new business plan focusing on efficiency and effectiveness, propelling the once small manufacturer to the front ranks of the automotive industry (Womack, Jones & Roos, 1991).

3 This chapter is based on the groundbreaking works of the MIT International Motor Vehicle Program (IMVP), which first introduced lean concepts and principles in the mid 1980s and early 1990s. Current research from MIT’s Lean Aerospace Initiative (LAI), a subsequent effort which began shortly after the IMVP, also served as a foundation for this chapter. For further insights and references, please visit their Web site http://web.mit.edu/lean/.
The Machine that Changed the World, by Womack, Jones and Roos⁴, presented the lean mentality to people outside of the Toyota Production System. The book’s authors stated that lean production principles meant “building what would only be supported by orders from the marketplace” (1991). This view quickly gained acceptance by production and supply specialists across the entire automotive sector. With time, lean thinking began permeating other activities and areas of the organization, transforming itself into what is known today as the lean enterprise approach (Murman, et al., 2002). Womack and Jones’ second work, Lean Thinking⁵, expanded the lean production mind-set to include the entire enterprise comprised of individuals, functions, and the legally separate but operationally synchronized institutions and their units. They declared that lean was more than a process. It was a way of thinking about an organization and all the activities taking place inside, how to provide this system with functional strength, and how to make that strength sustainable through time.

Lean Principles
The term lean is associated to little fat or fat free, similar to an athlete who has only the necessary physical attributes to succeed in a sporting competition, or a yogurt with the right amount of sugar making it sweet yet still a healthy dessert. It was employed in the manufacturing context because lean production methods used less of everything when compared to mass production methods: less material inventories, less time to develop a product or service, less time and space required to build and inspect, and so on (Grossi, 2003). In short, lean refers to utilizing less than what is normally required to fulfill a specific task – a fraction of the human effort, development speed, investment, and time to provide products and services.

⁵ Lean Thinking, by James Womack and Daniel Jones. 1996
Anything in the organization beyond what was considered necessary was termed process waste, or *muda*, in Japanese. Hence, the primary objective of lean thinking is the search and elimination of this waste at every level of the enterprise. The types of muda found are as extensive as the lean enterprise itself. Waste comes in the form of mistakes in the production process, overproduction of parts, excessive motion of people, waiting times, and more. As will be discussed later, waste becomes a pivotal issue of lean theory since it creates ambiguities that translate to poor business and policy decisions. An example of this is the erroneous belief that lean thinking is equivalent to simple cost reductions in processes. Often, firms engage in staff reductions, technological upgrades to shorten development cycles, or plain emulation of Just-In-Time manufacturing (Clinton & HSU, 1997) which, in the long run, create more structural inefficiencies (a type of muda consisting of inappropriate organizational structures, policies, business model structures, alignment, or strategies) harming the enterprise.

Womack and Jones introduce five principles that drive the lean thinking process: specifying the value of the product or service, identifying the value stream of the product or service, making the value flow without interruptions, letting the customer pull value from the producers and service providers, and the constant pursuit of perfection throughout the enterprise.

To begin, products and services must provide some sort of value to customers. A product is of value to people when it satisfies their needs at a reasonable price and time. The established value of a good or service will depend on its series of characteristics or attributes, the customer's willingness to pay, and the actual production cost of the good or service (Gómez Ibáñez, 1999). Value is not limited to what the end consumer gains from the enterprise, however. As contended at the beginning of this study, for the enterprise to be sustainable value must also be created for all the parties involved with the production of the good. Therefore, value creation is the ultimate reason for why the enterprise is formed. And value can mean different things to different stakeholders, sometimes coinciding and sometimes not.
A value stream consists of a series of processes, activities and operations for developing a product or service from its definition to its final delivery to the end consumer. The value stream is the heart of lean theory. Processes, activities and operations impact the product or service in three ways:

- They create or add value to the end product or service
- They create no value but are necessary to support the value creation activities
- They create no value and do not support any other activity in the value stream.

Thus, enterprise value-creation surfaces as the champion of lean thinking and it is the basis for value stream analysis, a three phase methodology consisting of value identification, value proposition and value delivery. The value stream analysis constitutes the steps for assessing enterprises in the lean model.

Something flows when it moves or runs smoothly, with unbroken continuity, as a fluid. Ideally, the value-creation steps must flow through the enterprise in a way that interfaces between each are seamless regardless of where the exchange takes place within the system. Anything causing resistance to the flows of the value stream will constitute waste.

Toyota planners believed that demand was something pulled by the customer and not pushed onto the customer. Pull, therefore enabled the flow of the products and services through the production process based upon real demand and requirement. This principle, theoretically, ensures no unwanted inventories throughout the value stream.

Management definitions constantly exhibit the words plan, coordinate, lead and control. In a sense, lean thinking seeks these same objectives as a strategic management framework would. However, unlike the traditional approaches where periodic revisions take place through time, lean thinking diverges by an intense pursuit of perfection. The lean organization continuously
seeks improvements to make on-going and substantial change in their business (Maskell & Baggaley, 2001). It is a dynamic entity proactively seeking change instead of reactively awaiting it. Surely, consequences emerge from this live form, but if well handled, the learning process for the members of the organization can help maintain that desired sustainable competitive advantage.

**Enterprise**

Catchy words and phrases are a common theme of management theories and practice since they create a culture and identity, based on a language, for members of a group useful to outlining their goals and tasks. Lean thinking is not much different from Total Quality Management, Six Sigma, Management by Objectives, and other schools on this matter (only that its talk is in Japanese which, for simplicity has been omitted almost entirely in this work). Nonetheless, the critical aspect of being a lean enterprise, and what makes it an attractive methodology for this study, is that processes and operations should create value to all the stakeholders involved and this requires a broad, systematic focus of the endeavor to understand all the interactions and exchanges or at least most of them. Cost cutting and optimizing one part of a process rather than optimizing an entire enterprise is against the value creation and value stream ideals of the lean mind-set. Both the terms stakeholder and system are presented with greater detail in chapters 3 and 4.

Defining ‘enterprise’ requires further thought. At times, for easier reading, the concept will be used interchangeably with that of ‘system’ unless specified otherwise. Conceptual and practical differences among the two exist and will be referred to later on in this study. More important, however, is the distinction between an enterprise and a firm or corporation. Normally, a business is referred to as enterprise. But in the lean context enterprise relates to something much broader: It is a systematic endeavor comprised of one or more organizations which

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are highly complicated and involve an element of risk. An enterprise is systematic because it has an array of related parts that work together toward a purpose. That purpose is only achieved with the serious work and determination of an endeavor. Serious work and determination are necessary given the high stakes resulting from difficulties and complications, skewed reward structures, and high probabilities of failure which add to the overall risk.

Ignacio Grossi (2003), in his master’s thesis, integrates the stakeholder and enterprise concepts in a useful form. Therefore, until each are examined independently in further chapters, the following suffices the discussion of thinking lean:

"An enterprise is the interconnected whole comprised of one or more organizations having related activities, unified operation, and a common business...

An enterprise is formed by all the internal operative entities of a firm plus all the organizations that help in the process of value creation. All these different entities constitute what is known as the stakeholders of an enterprise: those entities that hold a ‘stake’ or a legitimate interest in the results of the operations and strategies of the enterprise."

An enterprise can be seen as a sophisticated system with a process architecture set up around core activities (see Figure 5) that are designed to have all components integrated toward the satisfaction of the stakeholder needs. It must be emphasized that an enterprise is not a corporation or government, or a laundry list of institutions alone. It is not the beast created to tackle a problem or some venture. Instead it is the venture itself and all those who come together and support its fulfillment.
Value

Value, as defined by the authors of *Lean Enterprise Value*, is how various stakeholders find particular worth, utility, benefit, or reward in exchange for their respective contributions to the enterprise. It is what the stakeholder wants to get out of the venture it is getting into, while orienting the enterprise to its ultimate desire of *customer value*. But like all things in lean thinking, this definition leads to a dynamic framework where value can evolve as stakeholders change their priorities, their own willingness to pay or contribute resources, and the time horizons in
place which, in the end impact the value to the consumer. Without a comprehensive understanding of the value creation system, sub optimization can destroy the sustainability of the enterprise.

As is the case of ARRCI systems, understanding stakeholder value is difficult since there are times when their view of value is not identified with the value of the product (in this case, the service). Conflict arises here because, aside from the fact that stakeholder values differ among one another and change, these are embedded in the value stream of the enterprise and with ease can distort the value focus toward the customer.

For an enterprise to create value and eliminate waste, lean theory suggests a value-creation framework consisting of three phases: value identification, value proposition, and value delivery (see Figure 6). The first step, identifying the enterprise value, helps establish what the needs, interests and benefits are of each contributing member. At this point the enterprise value stream must be aligned to the values identified; establishing what activities and outcomes would add value to which stakeholders. This clarifies the second stage, the value proposition. Each entity will better understand how the enterprise relates to their objectives and what benefits the accomplishment of the project will provide them. The multiple relationships between all the parties involved and what they perceive as tradeoffs between contributions and outcomes are also a crucial element of this second phase. There must be a balance between the values of all the stakeholders since it enables a robust system less vulnerable to potential stress.
The last element of the value creation framework is the actual delivery of value or the implementation phase. This means production and deliverance through processes and operations in the enterprise. A process involves the flow of materials in time and space; its transformation from raw materials to semi-processed components to finished products. Operations are the work performed to accomplish this transformation, the interaction and flow of equipment and operators in a parallel, but interrelated, time and space (Shingo, 1989).

Satisfying the needs of all the stakeholders by creating value, providing a balanced and robust value proposition, and effectively and efficiently delivering the value all constitute the basic steps for eliminating waste and attaining the ultimate enterprise value in lean thinking.

**Applications to the Public Transportation Sector**

Today, the world is facing major challenges and achieving its needs in a very different mentality. With the industrial revolution, societies advanced from craft production to mass production.
This generated changes in production and operation techniques, modifying the economies everywhere. Lean thinking may accomplish changes of equal importance in all human activities impacting the way people live and work. But automobile manufacturing – and in fact, manufacturing in general – is very different from the public transportation sector. How, then, can services as these benefit from the lean mentality and culture?

The notion that lean thinking is customer-focused, meaning the customer provides the orientation for all activities of the endeavor, is sufficient common ground for establishing work practices with a pull approach. Customers drive the enterprise to pursue a desired service. The desired service will only exist when the contributions of all the stakeholders are felt and the knowledge they gain improves operations. Hence, services too can be viewed as a system of stakeholders with their own values impacting the enterprise. The value stream of the enterprise will consist of processes structured in an architecture that can be filled with waste as flows of information, resources and materials become more complicated. And a service without its human factors pursuing perfection is bound to lose any competitive advantage over alternative modes of transportation that have less complex flows, value streams and clearly established values. An example is the low-cost-low-fare air carrier with point-to-point operations when compared to a traditional hub airline with a more complex structure.

Perhaps there should be a shift in the way services are produced and provided to customers – to continue with this theory’s nomenclature – from mass servicing to lean servicing. Governments and transport providers will have to adapt to such change since thinking lean is already impacting the way people live today, generating new changes in the behavior and setting of societies and altering the economic characteristics and needs of communities everywhere. Public transportation, in all its forms, continues to try and accommodate mass production needs with a mass production insight while economic forces are shifting societal behavior and industrial potential toward the lean mentality.
The lean enterprise value approach helps determine how stakeholders are structured and organized in relation with the enterprise. The complexities of the structure, however, pose some of the greatest challenges to becoming lean and having only beef without fat. A systematic approach for reducing the threat of this waste is a step in the right direction. But to actually understand the effects of stakeholder interdependencies and structure, another powerful microscope must be used. And this is the focus of the next chapter, *theories of the organization.*
CHAPTER 4 – Theories of the Organization

“To translate a theory or world view into one’s own language is not to make it one’s own. For that one must go native, discover that one is thinking and working in, not simply translating out of, a language that was previously foreign…”

Thomas Kuhn, 1970

This chapter is devoted to understanding organizations and how they work. Lean enterprise theory is founded on the organization concept. Therefore, the analytical framework of the following pages is based on theories of the organization, particularly systems theory and transaction cost economics. Their importance is not limited to past contributions, however. Both fields continue to evolve, with complementing thoughts and approaches useful to lean thinking today.

Firms come in all shapes and sizes, with an authority and hierarchy in the form of a political structure responding to internal and external pressures. This arises because organizations have a mission or raison d'être, and to fulfill it they must possess that bureaucratic framework so necessary to acquiring and processing resources for achieving their goals. This chapter looks at organizations through two distinctive looking glasses: systems theory and transaction cost economics. Both are strategic management approaches, evolved out of organizational theory, discussing the existence and role of stakeholders in organizations. The two agree in the peripheral or subset status of the stakeholder but differ in its contribution and importance.

Comprehending these theories is essential to understanding the dominance of lean thinking. As will be presented, systems theory embraces the stakeholder as one of the many elements from a vast set of supplements to the organization. Lean theory, on the other hand, holds that all elements supplementing the organization are stakeholders. Transaction cost economics adopts the systems perspective where stakeholders are one of many groups. However, the theory specifies that it is shareholders (those with legal ownership of a firm or organization), and not
the stakeholders, who are of greater importance to the organization given their power and control of resources. It does, however, provide an essential point for lean theory advocates in that power defines the relationships between groups (with stakeholders sometimes influencing the needs of other stakeholders), therefore holding some more prominent and accountable than others. These concepts, as will be shown, are crucial to evaluating the organizations involved in ARRCI ventures and the strategies they implement through time.

The Study of Organizations
Knowledge attained from organizational studies is "as composite, hybrid, confused, paradoxical and multifaceted as the sociological, psychological, anthropological, economic, semiotic disciplinary bodies, and also business administration and management studies" (Strati, 2000). It is from this premise where organizational theory parts. Its roots date to the early twentieth century, with the works of sociologist Max Weber and continue to this day with ramifications toward systems theory, industrial organization, transaction cost economics, operations research and other fields, all a part of modern organizational theory⁷. Classical organizational theory identifies a large network of both stakeholders and their interconnections where collective strategies are formulated and the challenges facing them are resolved (Freeman and McVea, 2001) especially for large enterprises. It does not, however, explain the existence and nature of the organizations and their multiple components.

Despite the need for businesses and public entities to organize⁸, organizational theory did not receive serious consideration, as related to business, until the works of the Harvard Business

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⁷ Today Max Weber is clearly known as the father of modern sociology. His original theories related to the organization therefore remained exclusive to sociology and political science. It was shortly after the Second World War when numerical rigor and the works of Katz, Kuhn, Kahn and Thompson were incorporated with organizational theory leading to modern management science.

⁸ A convenient interpretation of what is meant by organizing a firm can be found in R.H. Coase's "Institutional Structure of Production" (Plunket, Voisin & Bellon, 2001). In it, organizing "describes how the activities undertaken within the economic system are divided up between firms. Some firms embrace may different activities; while for others, the range is narrowly circumscribed. Some firms are large; others, small. Some firms are vertically integrated; others are not."
School in the 1960s and ultimately Williamson in 1975. The Harvard research program comprised of Lawrence and Lorsch in 1967 established overall relationships between structure and strategy by analyzing poor and good performing organizations under different environmental circumstances (Hussey, 1999). Their findings corroborated the empirical notion that the right organizational structure of a firm depended on its strategy and mission. Williamson devised how alternative modes of organization influence the cost of transactions in sometimes counterproductive ways. This gave organizational study an analytical approach sufficient to gain the respect of businesses and researchers since.

**Defining an Organization**

Lean enterprise's primary building block is the organization. Organizations put together make the enterprise. But what exactly is an organization? Antonio Strati (2000) goes into the word's etymology to reach a semantic definition. The Greek word *organon* relates to a physical organ or instrument, and *ergon* relates to performance, work, execution and office. As a result, Strati yields “an instrumental view of the organization as a human artifact designed to achieve one or more objectives” (Ibid.). Looking at the Random House Dictionary of the English Language, organization has several functional definitions: a) a body of persons organized for some end or work; b) the administrative personnel or apparatus of a business and; c) the functionaries of a political party along with the offices, committees, etc. that they fill (Random House, 1987).

Both the library dictionary and Antonio Strati seem to revolve around the common theme of people and their functions. Consequently, one can say that organizations are a **human creation** comprised of humans with a set of tasks and – as mentioned earlier – with a bureaucratic framework and infrastructure required to accomplish a specific objective, be it business, policy, education, entertainment or other. This definition relates individuals with the organization through their jobs, defining an interaction and interpersonal relation that exist between the two. Members of the organization comprise working groups that seek satisfactory relationships among each other as well. They too have an internal set of
interpersonal relations influenced by norms, beliefs and attitudes (Lupton, 1983). An organization, therefore, is a system with many groups placed together where the primary element is human interaction.

The Systems Perspective
A systematic definition of organizations is best aligned with the enterprise concept used in this study. The systems approach was used in business management as far back as the 1970s by Kircher and Mason and has evolved since to the complex large integrated open systems (CLIOS) characterized by Sussman specifically for application in the transportation industry (2002). The systems theory, however, should not be the one, all-purpose theory used for understanding organizations. It is a tractable way of comprehending the intricacies they contain and a method to bind academic rationality with the sometimes “irrational” business environment.

A system is a “set of related parts which work together for a purpose” (Kircher & Mason, 1975). It is based on the scientific attitude where components have cause-effect relationships and there is a flow of resources across its boundaries to attain its purposes, with inputs and outputs (see Figure 7).

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9 In his book Introduction to Transportation Systems, Joseph Sussman introduces CLIOS as a “group of related units (subsystems), for which the degree and nature of the relationships is imperfectly known. Its overall behavior is difficult to predict, even when subsystem behavior is readily predictable.” In addition to CLIOS, 30 key points of analysis for transportation planners are thoroughly explained, reinforcing this notion of the systems perspective.
Kircher and Mason’s view limited inputs as coming exclusively from the environment and the associated outputs returning to it solely. None originated or terminated within the enterprise system, regardless of the multiple parties and the interactions involved.

Sussman, on the other hand, expanded by identifying related units (or subsystems) amplifying the degree and nature of the relationships taking place. Hence, systems, and especially transportation systems such as ARRCI, now presented the following characteristics:

- **Complexity**: multiple subsystems with increased communication processes and time-scales, adding ambiguity.
- **Large Magnitude**: a time and geographical frame for planning, development and operation extending many years and regions at a time.
- **Integrity**: the relationships between each and all subsystems are linked through feedback loops.
- **Openness**: multiple interactions with the environment which include social, political and economic aspects.

These characteristics brought forth critical issues including a rethinking of the input/output relationships taking place between the organization, its components and the environment. Moreover, the notion of tradeoffs emerged, therefore how they factored back into the original organizational setting also presented the advantages of the systems conception (see Figure 8).

![Diagram of External Components of the Transportation System](image)

**Figure 8: External Components of the Transportation System. J. Sussman, 2003**

The CLIOS approach places in evidence the problem of modeling the entire system, for the boundaries are almost inconceivable and only the relevant components must be chosen for such task (Sussman, 2002). The main discrepancy with lean thinking is that stakeholders are identified as "external components, people or organizations, which are not customers or suppliers but are nonetheless concerned" (Ibid.).
Contradictory to Sussman, Kircher and Mason, Williamson contended that shareholders deserved special consideration over other stakeholders because of their *asset specificity* in what is known as transaction cost economics (Freeman & McVea, 2001). Their stakes were specific, providing a direct and quantifiable relationship between inputs and outputs through equity and unlike the contributions of any other stakeholder. Such relationship should be emphasized by its Pareto efficiency\(^{10}\) and farsighted approach rather than by traditional conceptions of power. This is opposite to the organizational and systems perspective embedded in lean theory where all stakeholders are of significance. Nonetheless, the asset specificity and efficiency elements between groups are worth mentioning as they align with other elements of lean thinking and usefully depict the interaction between airlines and transit operators in ARRCI systems.

**Transaction Cost Economics**

One of the merits of the systems conception rests in its ability to internalize economic thought (Menard, 1997). Oliver Williamson used this to craft a methodology and approach that broadened the scope of organizational analysis. He scrutinized the firm by looking at its internal markets and hierarchies, eliminating the zero transaction cost postulate of transaction cost economics\(^{11}\), as alternative modes for internal processes of systems. Williamson reduced the significance of power in the study of contracts and organizations. The result was a method explaining how trading partners choose an institutional alternative that offers the greatest protection and lowest total cost (Shelanski & Klein, 1999). Transaction cost economics today is an important area related to organizational theory used mostly by private firms, particularly at the strategic management level to evaluate the interface between systems' units. Its rigor and acceptance prevails, perhaps, because of its observational standpoint, where contracting within a firm must be assessed from the perspective of total systems performance.

\(^{10}\) Pareto efficient allocations are those in which no one person can be made better off without someone else being made worse off, including the possibility of transfer of payments (Nicholson, 1995).

\(^{11}\) The zero transaction cost approach for understanding institutional and organizational processes assumes that the choice of governance structure is of no account since any advantage ascribed to one form can be replicated without cost by another.
Section II: Strategic Management Literature Review

Transaction cost economics sets the stage where economic thinking, business strategy, and organizational theory meet. Its focus is on institutional detail, rather than mathematical display. Contracts within a firm have a particular structure and particular features. Such negotiations carry considerable normative weight and is, therefore of great value to strategic management. What transaction cost economics explains is that efficient processes in a business are above political, institutional and cultural considerations, whereas the theory's opponents claim that efficient processes are subordinate to these (a point of much interest in later chapters).

Williamson's work applied to airport rail and remote check-in systems exposes an interesting fact: to an extent, it is true that the efficient processes in a business are above political, institutional and cultural considerations instead of the power elements existent. This is obvious in all three cases under examination since each has delivered an efficient service (or product) as it promised. Subordination to political, institutional and cultural considerations is also the norm, however, as is observed in the systems created where the setting hampers results and performance, specifically impacting low ridership and loss. The setting is what Douglas North described as formal and informal institutions (North, 1992). Formal institutions include laws, rules, policies and their actual enforcement, while informal institutions are the norms, values and mental models of the constituents who make up the system (Ibid.). Lean thinking is of use here since it goes beyond in its analysis, taking advantage of transaction cost economics and all the elements operating in a same environment to explain certain causal relations among groups in a system.

Williamson provided several crucial features contributing to strategic management (Williamson, 1993). Among them, those which are of interest to ARRCI systems planning include the following:

- the transaction is the basic unit of analysis;
the critical dimensions with respect to which transactions differ are frequency, uncertainty and asset specificity;

- each generic mode of governance is defined by a syndrome of attributes, whereupon each displays discrete structural differences of both cost and competence;

- each generic mode of governance is supported by a form of contractual law;

- transaction cost economics, always and everywhere, is an exercise in comparative institutional analysis – where the relevant comparisons are between feasible alternatives; and

- the environment induces changes in the cost of governance

In addition, Williamson defends that power relationships are recognized in any organization despite its diffuse and vague definition and are not as significant as the accepted relations where “because B is bigger than A, B enjoys a power advantage in the exchange relation between them. Or because A is dependent on B, B has a power advantage over A. Or if A and B were in initially on parity, but a disturbance has occurred that works in B’s favor, then parity is upset and B now has more power” (Ibid.). To this, he relates power and control between groups in accordance with the efficient transactional exchange taking place based on what he calls a farsighted systems view, which is a broad perception of all elements impacting the organization in the long run instead. Transaction cost economics therefore states that the relationship may be farsighted, deliberately incurred and supported with a safeguard dependency to the degree that it will have net benefits for all parties. Safeguards will then build up as asset specificity increases in the contract; with the extreme expression of this being unified ownership or vertical integration and the opposite being the multi-dimensional firm (Williamson, 1993).

The M-Form (Multi-Divisional Corporation) Example

Multi-divisional, or M-form, corporations provide an example for transaction cost economics. The objective of creating an M-Form firm is to improve capital allocation by exploiting the
informational advantages that internal processes have over external market processes (Carroll, Spiller & Teece, 1999). Examples of this in the ARRCI study are both the Deutsche Bahn structure and the British Airports Authority structure. DB is subdivided into five firms each conducting business with each other. Similarly, BAA has its Airports Division and its Heathrow Express Division, two sister companies that interact and exchange resources among each other in equal or greater amount than with the external environment.

The private sector benefits gained from this particular institutional setting are reduced since structures can be imitated with ease by competitors who follow. This is the case of BAA in the global airport management arena. Groups as TBI plc, Fraport, and Aéroports de Paris have attained significant market share in the past decade after shaping – and even improving – their operations to resemble the British M-Form. A government organization, on the other hand, achieves greater benefits when arranged in this fashion since competition is not a driving factor. Deutsche Bahn has divisions similar to BAA, working independently and interacting in a way that should reduce overall system costs. However, DB has specific authority arising from rights such as property and tax deductions, and regulation increasing the advantages of its multi-divisional setup. What is more, Deutsche Bahn can also gather private sector managerial practice and expertise when necessary targeted to specific divisions. A private firm as BAA can only seek government assistance to a certain extent.

Performance, according to Williamson, is only achieved when organizational arrangements are properly designed and astutely implemented (Williamson, 1991). An efficient system of corporate governance can and will make great difference as to whether an enterprise succeeds or fails. This is the mark of transaction cost economics. The power element, though present, will have more bearing on labor/management relations and the producer/final products market due to management's control of valuable information when conducting negotiations. It will have even greater importance in politics. The theory fails, however, to embrace the elements of incentives, skills and organization structure and the role of knowledge and knowledge
accumulation (Carroll, Spiller & Teece, 1999). Furthermore, in transaction cost economics there is the assumption that change comes in an orderly manner. Such criticism has been stated by Kay (1997), Carroll (1996), and Teece (1999). Thus, frustration exists as to how turbulence and innovation impact the organizational framework as a whole.

The modeling of organization systems today, far from its modest starts nearly one hundred years ago, has continued as planners and strategists extend these concepts toward quantitative areas as management information systems and operations management. Lean thinking and theories of the organization derived from classic organizational theory, specifically systems and transaction cost economics, all can provide valuable insight to the question of ARRCI performance. But it is important to consider stakeholder theory in order to develop this insight.
CHAPTER 5 – Stakeholder Theory

The lean enterprise is a system of interrelated stakeholders closely aligning their values toward a general proposition while satisfying their multiple needs. Systems and their interrelations have been addressed in the previous chapter, Theories of the Organization. The following pages now focus on the stakeholder element of the enterprise definition, more specifically who are they and how to define their boundaries and those of the enterprise. Once this is done, the chapter closes with the exemplary case of the airport/public transportation arena and the planning of ARRCI services. The most significant stakeholders of the ARRCI system are identified and their boundaries are established.

Introduction
There are many groups who have a stake in the success of an enterprise. Each of their interests must be understood in order to make the complex endeavor work properly and give the desired outcomes. Stakeholder theory, in essence, is this aggregation of groups noted above. It presents an approach similar to the traditional systems theory where an open system is part of a larger network interacting with its environment. However, the complexities managers face when dealing with choices and decision reveals a limiting conceptual difficulty of the systems perspective forcing a distinct approach: “there is no obvious starting or ending point for the analysis” (Freeman & McVea, 2001).

In the 1970s American firms embraced difficulties and problems which showed their vulnerabilities, particularly during the oil crisis of 1973 (DeLong, 1997). This turbulent environment presented to managers and executives increasingly became the norm and organizational theorists found the systems perspective somewhat broad and diffused for going

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12 Enterprises, as will be explained later on, rely on a centrally established guiding unit fulfilling these functions of leadership. Normally, and in single-organization enterprises, this unit is the management team.
in-depth when observing firms and institutions. Consequently, a new conceptual framework
eaching the role of stakeholders emerged with Freeman’s 1984 work *Strategic Management, a
Stakeholder Approach*. In this book the author established other members, aside from the
stockholder (the investor or owner), as contributing sources of continuity and life of an
organization. These groups were the stakeholders and they were defined as “any group or
individual who can or is affected by the achievements of the organization’s objectives.”

The concept of stakeholder is nothing new, nevertheless. During the last forty years stakeholder
analysis has been applied to many diverse areas of study and applications such as economics,
marketing, corporate governance, corporate social responsibility, business ethics, environmental
issues, organizational studies, and so forth (Grossi, 2003). The stakeholder definition evolved
from its origins at the Stanford Research Institute, now SRI International, to accommodate the
views and needs of researchers through time (see Figure 9). Still, the main argument remains:
managers need to understand the concerns of every group contributing to an organization
including the shareholders, the employees and their representative unions, the customers, the end
users (which sometimes coincide with the customers), creditors, society and even the
environment. Only this way would the objectives of the firm be properly developed and fulfilled
since each stakeholder would support those objectives. Sustainability and success, therefore, are
only possible when positive relationships exist between the many groups and the management
structure in place.

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<table>
<thead>
<tr>
<th>Date</th>
<th>Author(s)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>Stanford memo</td>
<td>“those groups without whose support the organization would cease to exist”</td>
</tr>
<tr>
<td>1964</td>
<td>Rhenman</td>
<td>“are depending on the firm in order to achieve their personal goals and on whom the firm is depending for its existence”</td>
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<tr>
<td>1971</td>
<td>Ahlsted &amp; Jahnukainen</td>
<td>“driven by their own interests and goals are participants in a firm, and thus depending on it and whom for its sake the firm is depending”</td>
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<td>1983</td>
<td>Freeman &amp; Reed</td>
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<td>Freeman</td>
<td>“can affect or is affected by the achievement of the organization’s objectives”</td>
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<td>Freeman &amp; Gilbert</td>
<td>“can affect or is affected by a business”</td>
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<td>1987</td>
<td>Cornell &amp; Shapiro</td>
<td>“claimants” who have “contracts”</td>
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<td>1988</td>
<td>Evan &amp; Freeman</td>
<td>“have a stake in or claim on the firm”</td>
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<tr>
<td>1988</td>
<td>Evan &amp; Freeman</td>
<td>“benefit from or are harmed by, and whose rights are violated or respected by, corporate actions”</td>
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<tr>
<td>1988</td>
<td>Bowie</td>
<td>“without whose support the organization would cease to exist”</td>
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<tr>
<td>1989</td>
<td>Alkhafaji</td>
<td>“groups to whom the corporation is responsible”</td>
</tr>
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<td>1989</td>
<td>Carroll</td>
<td>“asserts to have one or more of these kinds of stakes” – “ranging from an interest to a right (legal or moral) to ownership or legal title to the company’s assets or property”</td>
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<td>1990</td>
<td>Freeman &amp; Evan</td>
<td>Contract holders</td>
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<td>1991</td>
<td>Thompson et al.</td>
<td>In “relationship with an organization”</td>
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<td>1991</td>
<td>Savage et al.</td>
<td>“have an interest in the actions of an organization and… the ability to influence it”</td>
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<td>1992</td>
<td>Hill &amp; Jones</td>
<td>“constituents who have a legitimate claim on the firm… established through the existence of an exchange relationship” who supply the firm with critical resources (contributions) and in exchange each expects its interests to be satisfied (by inducements)”</td>
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<td>1993</td>
<td>Brenner</td>
<td>“having some legitimate, non-trivial relationship with an organization [such as] exchange transactions, action impacts, and moral responsibilities”</td>
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<td>1993</td>
<td>Carroll</td>
<td>“asserts to have one or more of the kinds of stakes in business” – may be affected or affect…</td>
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<td>1994</td>
<td>Freeman</td>
<td>Participants in “the human process of joint value creation”</td>
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<tr>
<td>1994</td>
<td>Wicks et al.</td>
<td>“interact with and give meaning and definition to the corporation”</td>
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<td>1994</td>
<td>Langtry</td>
<td>The firm is significantly responsible for their well-being, or they hold a moral or legal claim on the firm</td>
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<td>1994</td>
<td>Starik</td>
<td>“can and are making their actual stakes known” – “are or might be influenced by, or are or potentially are influencers of, some organization”</td>
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<td>1994</td>
<td>Clarkson</td>
<td>“bear some form of risk as a result of having invested some form of capital, human or financial, something of value, in a firm” or “are placed at risk as a result of a firm’s activities”</td>
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<td>1995</td>
<td>Clarkson</td>
<td>“have, or claim, ownership, rights, or interests in a corporation and its activities”</td>
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<tr>
<td>1995</td>
<td>Nasi</td>
<td>“interact with the firm and thus make its operation possible”</td>
</tr>
<tr>
<td>1995</td>
<td>Brenner</td>
<td>“are or which could impact or be impacted by the firm/organization”</td>
</tr>
<tr>
<td>1995</td>
<td>Donaldson &amp; Preston</td>
<td>“persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity”</td>
</tr>
</tbody>
</table>


Figure 9: The Stakeholder definition evolving through time
The table's definitions range from simple and concise to large and ambiguous. Nonetheless, the key point to remember is that stakeholders are many groups combined to achieve a purpose, some with greater influence than others. They will include inside members of firms as well as elements from outside the organization. And the consequences of their participation can range from economic and operational to environmental, political and social. As long as these groups follow Freeman's premise — anyone affected or who can affect the organization's outcomes — the range of stakeholders can be very large.

**Identifying Stakeholders**

The stakeholder view, as was explained, features the same tacit problems as systems theory in that too many components exist and are immensely difficult to evaluate. This similarity, however, also provides the basis of their departure. Stakeholder theory, by stating that "all affecting and affected groups are stakeholders"; must assess who are those groups actually affecting and being affected in the enterprise. Furthermore, the theory determines the boundaries of the enterprise in terms of which are the most relevant groups to consider (i.e. who are the salient stakeholders from the set of all stakeholders, something not done in systems theory.

Identifying the degree of importance of each stakeholder is a massive task since stakeholders are interrelated in complex networks, particularly in enterprises comprising multiple organizations. Mitchell, Agle and Wood (1997) suggest recognizing and classifying stakeholders by the presence of three attributes: the stakeholder's power to influence the firm; the legitimacy of the stakeholder’s relationship with the firm; and the urgency of the stakeholder claim on the firm.

As is the case of any firm with a mission, an enterprise exists to survive, grow and succeed. It does this by satisfying the needs of all its stakeholders through the value creation process described in chapter 2 which leads to the accomplishment of the enterprise mission. Those who can affect the enterprise must have power to do so. They rely on physical resources as coercion and utilitarian (power in exchange of materials or resources) and symbolic means to impose their will among
other stakeholders in the relationship (Grossi, 2003). Their abilities are not limited to having a direct impact over other groups. They can influence actions and decisions, indirectly, in the form of pressure groups which exert their power on the managerial assembly of the firm.

**Legitimacy** is perceived by stakeholders as the partner’s reputation in a given industry or area (Oliver, 1990). This reputation is built on the assumption that the actions performed by the group are desirable, acceptable and appropriate to what the sector agrees to as the norm. For instance, the legitimacy of a service is relevant for convincing users that they are paying appropriate prices for it. If there are government subsidies being provided, taxpayers must view these as contributing to social objectives (Berg, Pollitt & Tsuji, 2002). The legitimacy of a stakeholder will constantly be evaluated as its own performance varies and the elements defining the normal environment gradually change.

Mitchell, Agle, and Wood describe **urgency** as the dynamic characteristics of a relationship or claim between parties. These are the *time-sensitive* nature of the interaction pursued and the *importance* or *criticality* the action has with regards to the operation and/or strategy. Grossi, however, redefines the urgency attribute simply as *criticality* since the term involves both urgency and importance. Firms in an enterprise can have urgency, importance or either two.

Applying this identification and classification methodology toward multi-organizational enterprises is as valid as doing so with a firm or a single-organization system. But a plural enterprise requires the insertion (or definition) of a group with a leading management capacity and obliged to provide a mission along with a course of action to sustain it. Thus, an enterprise **leading core** must emerge within the system. It must work as a hub, integrating the multiple relationships and objectives that flow between all the stakeholders. It must also seek the equitable distribution of social benefits and risks among the parties involved. The leading core itself is a stakeholder comprised of members of one or more enterprise organizations and often carries one or more of the elements power, legitimacy and criticality. But, sometimes this group lacks power, legitimacy
or urgency (or a combination of the three) and their symbolic position then depends on other attributes of lesser intensity.

**Determining Stakeholder Salience**
When a stakeholder has power, legitimacy or criticality it is considered a relevant force in an enterprise and it requires attention. The impact exerted by this relevant stakeholder will define the enterprise's barriers and those of its components. The approach presented by Mitchell, Agle and Wood is useful in that it allows for system managers to establish the salience of groups they interact with and the impact these exert on the enterprise. Hence, stakeholder salience will be determined by how the leading core perceives stakeholders' control of some of the attributes of power, legitimacy and criticality (Grossi, 2003). This leads to a model in which stakeholder salience is determined by both the cumulative number of attributes and the intensity or relative strength of each.

The result of this approach is reflected in three stakeholder levels constantly changing due to the subjectivity of the management group classifying them (see Figure 10):

- **Latent Stakeholder**: these are stakeholders with only one out of the three attributes (power, legitimacy and criticality). This level includes dormant, discretionary and demanding stakeholders.
- **Expectant Stakeholders**: Stakeholders with two attributes are termed expectant. They include dominant, dependant and dangerous.
- **Definite Stakeholders**: When a level has all three attributes, they are highest in the hierarchy and are known as definite.
Each level allows the stakeholder to modify its condition by acquiring or losing one of the attributes through time. When this takes place, the leading core of the enterprise (or the management group) must take note and respond accordingly. The convenience of the theory also permits non-stakeholders, or potential stakeholders, to increase their importance and impact on the system. In a sense, the enterprise is a market environment where groups interact through complicated transactions exchanging information, materials and resources. And because of this,
lean enterprise, transaction cost economics and stakeholder theory all fit properly to evaluate airport rail and remote check-in systems.

The Stakeholder Challenge of ARRCI

In a very simplified sense, the United States' public transportation planning framework is an emblematic example of a convoluted and dynamic stakeholder system where, despite the 'public service' mission in mind, the stockholder mentality continues to dominate in a very non-lean fashion. Indeed, public services and infrastructure do not have the shareholders or stockholders of private firms. Nevertheless, through the appropriations and budgeting processes of the federal government legislators have a sense of property and ownership over the systems they support, and the say of other contributing groups are very weak and sometimes null. The appropriations process serves as a set of actions determining the attributes of a project from a single financially capable group or shareholder. The actions are shaped in lengthy negotiations of several years between many agents controlling decisions and financial resources at the government level. Those groups influencing the process demonstrate the traits of power, legitimacy and criticality. And the impact, of course, is felt on the entire public transportation enterprise.

As U.S. transportation systems head toward Intermodal planning with infrastructure and interfaces between separate modes, the shareholder mentality intensifies and greater problems emerge. This organizational structure (specifically the U.S. Department of Transportation, though common also at the state and local levels including of port authorities and metropolitan transit agencies) is part of the heritage from the evolution of policies, technologies and industry, which allowed for sustained development of each system separate from one another and little connectivity in between. Consequently, objectives are pursued by each modal agency with little coordination among each. The result is a series of independent agendas without the robust value proposition suggested in the previous chapter.

14 Interview with Mr. Mortimer Downey, Former Deputy Secretary of Transportation
This is slowly changing as technology, policies and equipment are set in place so that services are provided where users do not distinguish a change from one mode to another or that, if present, the exchange is felt at a minimum. The ARRCI service is one of these cases with surface transportation meeting air transportation for the benefit of the public. By 1991 consensus in the political scene emerged and a series of policy statements were incorporated into law celebrating the intermodal approach. Thus, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Office of Intermodalism in 1992, two landmark results of public works and social policy, came into existence (Coughlin, 1997). Nonetheless, the framework lacked institutional mechanisms to actually improve integration and connectivity, a key point for an ARRCI to succeed (as is noted in sections III and IV). There remain interests and objectives of particular transportation bureaus and political constituencies which are in tension with the idea of intermodalism. What is more, ownership of facilities, the importance of parking revenues for airports, the precarious financial situation of airlines and the aftermath of the 9/11 attacks, airport security delays, reduced federal subsidies for transit agencies, different leadership characteristics, private sector relationships, and other pressures are also some of the challenges multiple agencies pose to the airport access question. Each group is a stakeholder with its own interests and agenda (or, as will be demonstrated, each is a system of stakeholders with many secondary agendas), and each wants to go its own way.
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Chapter 6 - London Heathrow Express

What Is and What Is Not
In the words of Cato Institute's Deroy Murdock:\(^{15}\):

"Journeys begin at Heathrow Central Station, a short walk from Terminals 2 and 3. A clean, sleek, well-lit entryway opens onto a ticketing area. User-friendly machines with multilingual, computer-touch screens sell tickets and accept credit cards as well as dollars, pounds, marks, francs, yen and euros. The one-way, 12 pound fare roughly equals $19.00. Up to four children under 16 can accompany each paying adult for free. Frequent riders can buy 10 fares for the price of eight...

Returning to Heathrow, a passenger on American, British Airways and 14 other airlines may check his luggage at Paddington Station two or more hours before departure. He then either may sight-see [ ] baggage-free [ ] or grab a boarding pass and walk straight from the train onto his plane. Like magic, his suitcases travel independently from Paddington to the luggage carousel at his final destination."

London’s Heathrow Express has been revered around the world as a leading example for a successful airport rail and remote check-in system. Its quality of service and on-time performance, high passenger counts, environmental and safety record, and financial performance have all been mentioned at one time or another by ARRCI enthusiasts. In fact, and to conclude his thought, Murdock argues that Heathrow Express’ accountability to stockholders and bankers should be followed “to make Gotham’s (i.e. New York City’s) airport links as modern as London’s.”\(^{16}\)

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\(^{16}\) Ibid.
In the Heathrow example, the efforts to its accomplishments are not solely from the private sector. Indeed, the system was a £450 million project which began construction in 1993 as a joint venture between the British Airports Authority (BAA plc), a private entity, and British Railways, later privatized in 1996. Furthermore, upon completion a wholly owned subsidiary of BAA, Heathrow Express Ltd, was formed to operate the service, eventually taking over once inaugurated in 1998. Nonetheless, planning, designing and executing the development required effort going as far back as the 1950s in what were then public agencies. Thus, as is the case with every system reviewed, Heathrow Express is the result of a unique historic setting with a series of common elements visible in every ARRCI system.

In 1987 the British Government took the bold step to privatize the British Airport Authority (BAA). It became the first significant commercial airport operation in the world to undergo such transfer. The reasons have been researched extensively by authors as Ashton and Winston, Doganis, De Neufville and Odoni, and Wells, and they are not the focus of this thesis. However, one important justification of airport privatization concerns airport rail and remote check-in facilities and that is the cost of capital when proceeding with capital improvement programs.

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\[17\] In today’s figures, this is approximately USD740 million.
The capital costs required for the maintenance and improvement of airport infrastructure are high. Therefore, like with most transportation systems throughout the world, it is uncertain whether operating revenues can recover the capital investment, placing operators and owners in financial difficulty\textsuperscript{18}. That airports are natural monopolies further intensifies problems for owners and operators. Their ability to seek creative revenue sources and funding mechanisms can be limited by governmental processes and regulations. Britain's BAA was – and still is - no exception to this. Aside from the studies, analysis, and development approvals that a business would normally seek when beginning a large project, the government owned BAA also had to take steps to acquire funds in the forms of subsidies, grants and even operating revenues such as user charges and fees (Gómez Ibáñez and Meyer, 1993).

These and other reasons led to the creation of BAA plc, responding to a private Board of Directors. The British government, however, held a \textit{Golden Share} until May 2003 when the

\textsuperscript{18}This is mostly evident in transit systems. For further information, please read TCRP-62, mentioned earlier.
European Court of Justice declared it illegal\(^{19}\). This gave the Government exclusive rights for major decisions. Nowadays, though there is “freedom of action” and a right to residual income, the U.K. Government has designated Heathrow (along with three other major airports in the country also owned by BAA) for detailed controls under the Competition Commission and the Civil Aviation Authority (CAA), making this one of the most sophisticated regulated systems in the world (De Neufville and Odoni, 2003).

All this leads to a main point: U.K. railways, London Underground, Heathrow International Airport, and even the country’s flagship carrier British Airways, all critical stakeholders, were all in the public sector when considerations for a Heathrow Express first began in 1985. Only after 1987 did private interests control BAA and afterwards a significant portion of the Heathrow Express enterprise. And still, because of the Golden Share, the public policy element of decision making in BAA really persists at least through 2003 and beyond. Furthermore, unlike the other cases being reviewed later on, both the airport authority and the ARRCI service operator belong to the same corporate structure.

\(^{19}\) According to the European Court of Justice (ECJ), the Golden Share restricted the free movement of capital within the single European market and allowed excessive political “grip” from the Government. (May 13, 2003) http://news.bbc.co.uk/2/hi/business/3022809.stm
Service Overview
The private railway operator Railtrack, now Network Rail (after several failed private efforts), and BAA have a franchising agreement for the Heathrow Express. BAA signed a 25-year agreement with Railtrack for the use of the 12-mile main line (Great Western Main line) stretch from Paddington to Airport Junction near Hayes. Here, Heathrow Express trains leave the main line to enter a five-mile tunnel continuing underneath the airport complex. BAA is responsible for the five-mile underground section from Airport Junction to Terminal 4, via the central area (see Figure 12 and Figure 13). There are two stations, one serving Terminals 1, 2 and 3, and a second, four miles away, serving Terminal 4. Paddington station, the London terminus, has two platforms dedicated to Heathrow Express, and full airline passenger and luggage check-in facilities.

14 four-car Class 332 trains traveling at 160km/h (about 100mph) are used by Heathrow Express. These were engineered and built by Siemens Transportation Systems in Germany, in partnership with CAF of Spain. The train, with first class and express class cabins, provides a travel time estimated to be 15min. (one way), with 15min. headways. Such travel times are the best any mode of transport can provide from downtown London to Heathrow Airport. The Piccadilly Line takes between 45 minutes and 1 hour, and the buses and taxis take about 1 hour and much longer in rush hours. As for tickets, they can be purchased in many ways:

• Online
• On board the train
• At touch-screen ticket machines at both Heathrow Airport and Paddington Station
• At any underground ticket counters
• At the different Heathrow Express desks located in Paddington Station’s concourse, the arrival halls at the airport (Terminals 1 and 4), and at the Heathrow Express Central station at Heathrow Airport.

Airlines do require, however, 2 hour advanced arrivals prior to boarding for baggage check-in purposes. They also operate from 5:00 a.m. to 9:00 p.m. daily. Baggage is handled by Airport Express personnel who load and unload at Paddington Station and at Heathrow Airport, placing it into the distribution system that reaches the airlines. In other words, the process includes airline check-in personnel, Heathrow Express personnel, and the multiple ground handlers servicing airlines at the airport.

At present, eight airlines provide check-in services from Paddington Station to Heathrow Airport. This has not always been the case, since the facility allows for up to 27 carriers at a time. A review of available services since 1998 shows the high uncertainty the facility faces with regards to airlines and their participation (see Figure 14). Airlines seem to “come-and-go” with great ease, causing disruptions in passenger traffic and operating revenues.
Section III: From London to Madrid by Train

Airline | Jan. '03 | Apr. '03 | Sep. '03
--- | --- | --- | ---
Air Canada | yes | yes | yes
Austrian Airlines | yes | yes | yes
Australian Airlines | yes | yes | yes
British Airways | yes | yes | yes
bmi | yes | yes | yes
Finnair | yes | yes | yes
LOT | yes | yes | yes
Lufthansa German Airlines | yes | yes | yes
Qantas | yes | yes | yes
SAS | yes | yes | yes
Singapore Airlines | yes | yes | yes
Sri Lanka Airlines | yes | yes | yes
Thai International Airways | yes | yes | yes
Varig Brasil | yes | yes | yes

Total Airlines Present | 14 | 12 | 8

Figure 14: Changes in airlines providing service at Paddington Station. Data available from BAA, plc, and tabulated by the author.

The reasons behind each airline's decision to withdraw the service follow the overall woes of the industry, with an economic downturn in late 2000, world affairs in 2001 and 2002, and most recently, Severe Acute Respiratory Syndrome in 2003. Even British Airways, who has been an active supporter and participant since 1998 and is the carrier with majority interest and most passenger traffic in the region, suspended its services:

"Our Paddington check-in facility is being withdrawn from 31 July 2003. The decision follows a thorough review and is just one of a number of difficult business decisions British Airways has had to take in the current climate. We're withdrawing it as passenger demand for this service has greatly reduced."

British Airways spokesperson in an interview with the BBC, June 2003.

But just how much is attributed to bad economic times?
Facts and Figures
Heathrow Express began as a joint venture between BAA and the then public British Rail. Their contributions were 70:30, meaning that BAA provided 70 per cent of the initial investment while British Rail provided 30 per cent. Railtrack had the liability to construct as far as Airport Junction (with construction costs funded up to a capped limit by BAA) and the BR Board retained the benefits of the future income streams. Part way into the implementation, the railway also was restructured and then privatized (in 1996). As a part of this process, those benefits were sold entirely to BAA giving them full ownership of the system (though not the entire track).

In its 5-year duration complications in the project emerged, as would happen in any Large Engineering Project with 130 contractors. At times, cost projections were off by 68 per cent (BAA, 1998); forecasts were wrong; the Heathrow Tunnels collapsed in 1996; and little dialogue between the airport and the airlines using the service existed. This last point reflects the relationship between BAA and its customer airlines at the time. And even after the Heathrow Express began operating, low service standards were brought forth to the Civil Aviation Authority in May 2000 in a request by British Airways and other signatory airlines for improvements. The report, part of a broader effort to better regulate the private entity, demanded better measuring techniques for maintenance of servicing facilities (baggage tunnels, carrousels, belts, etc.) and a proactive approach rather than a reactive approach to facility operations and development (CAA, 2000). This all has happened despite the fact that Heathrow Express personnel comes from airlines and hotels, and rail operators possess a unique labor contract which separates them from the Associated Society of Locomotive Engineers and Firemen (ASLEF), the U.K. union for train drivers and operators in all rail transport.

An environment where tenants and airport operators clash constantly is not uncommon in the airline industry. It happens every day, in every airport, and with every airline. This is because
organizations are constituted through the daily actions of their members and of the people they deal with in the environment, directly or indirectly (Groth, 1999). However, when these problems threaten to strain relationships, success of any large project with a high risk becomes easily questionable. Not only does the system begin to experience problems while trying to be successful at that moment in time, but any necessary future expansion and innovation requiring further consensus and support from stakeholders becomes even more difficult to attain.

All this reflects in the airline’s desire to maintain a service that “does not add value to the product” and, of course, the passenger figures using the system since inaugurated in 1998:

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21 Heathrow Express has just recently experienced another legal confrontation with TWA Airlines LLC (now American Airlines Inc.). In this occasion the U.S. National Arbitration Forum overturned TWA’s complaint stating that the name ‘Heathrow Express’ was their registered trademark dating back to 1980. The panel dismissed the complaint finding that TWA had engaged in Reverse Domain Name Hijacking. For further information, visit http://www.arb-forum.com/domains/decisions/102956.htm
In its first nine months of operation (1998-1999), Heathrow Express reported an operating loss. This quickly changed the following year, as the service became more popular and gained recognition. The service, however, may take some time to reach the 50 per cent market share for all Heathrow Airport traffic as BAA wants. Overall passenger counts at Heathrow Airport are significantly higher. In the same period since the ARRCI system began operation, total operating profits for retail services alone ranged between £378 million and £398 million, and total BAA profits were close to £1 billion:
The tables reveal that Heathrow Express is a minor fraction of the BAA operation, even when compared to Heathrow Airport alone. What is more, the bulk of profits coming from the passenger are independent of how they arrive to the airport. The true gain comes from what services are offered at the airport passenger buildings. And Heathrow, like many other hub airports around the world, has a significant portion of transiting passengers who are flown in by the airlines themselves.

An argument that services at Paddington Station include retail for travelers can surely be made. However, this only extends the retail operation of the airport to the remote check-in, increasing
overall costs since two sites now serve the exact same passenger base while revenues don’t increase but simply fragment between both locations. The analogy is similar for the airlines, only with service provision instead of retail and concession stands. Airlines close their operations at Paddington station because the cost of sustaining them is higher than at the airport itself, and no value to the airline was extracted from the added passenger convenience.

Adding further uncertainty to Heathrow’s ARRCI revenue streams, in November 2001 Britain’s Competition Commission expressed interest in revising surface access revenue allocations within BAA. Currently, the Heathrow Express Operating Company Ltd activities are closely linked to the airport operator Heathrow Airport Ltd (both sister companies under the BAA plc umbrella). The airport operator owns nearly all the assets associated with the Heathrow Express, from the airport to Paddington Station. BAA’s Profit Center Reporting (PCR) for Heathrow has two profit centers splitting infrastructure from train operations. The assets associated with rail operations (i.e. the trains themselves) have been transferred to the non-regulated business unit ‘Train Operations’, so that the cross-charge for the trains running the service falls within standard commercial business units, a common practice. The only problem with this picture, as seen by the CAA, is that there is no cross-charge between the business units of BAA. All that exists is a Heathrow Express management charge made to Heathrow Airport for carrying out the train operating services. This recharge covers the trains operating costs amended by an added 10 per cent profit uplift. Thus, under this system, Heathrow Express Operating Company Ltd (as a stand-alone vertically integrated rail entity) would fail to break even only with the revenues from the fare box (CAA, 2002).

In the end, the picture is bound to improve given the regional effort for increasing travelers’ usage of the airport rail system. Already BAA is evaluating a new train service between

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22 RRCB Implementation in the British Airports Authority, November 2001. This report addresses the CAA’s agenda to implement a new reporting structure within the authority better splitting airport assets and their corresponding capital expenditures and allocations of cost and revenues within the regulated and unregulated domains.
Heathrow Airport and St. Pancras Station (due to open early in 2004). The stop would benefit from major connections from both local and long-distance services on the Great Western Main Line. It also has the backing of other stakeholders – though not necessarily the airlines – such as the Government Office for London, Stockley Park Consortium Limited and the London Borough of Hillingdon. Difficulties will remain though, with stiff competition in the London-Heathrow route as private bus operators, taxi, and other services continue to emerge.

Further plans to increase passenger counts include the green travel initiative for customers to arrive to Paddington Station and the Mayor’s Transport Strategy in London. This service is in cooperation with Network Rail and the Licensed Taxi Association. Passengers share a taxi if they have similar destinations, paying a flat rate which is lower than the usual fare. The Transport Strategy seeks to better integrate the National Rail system with London’s other transport systems, specifically those of Transport for London (TfL). The partnership among rail operators is aimed at providing better service frequency, standards for station facilities, infrastructure for mobility-impaired people, and the development of increased capacity on radial and tangential routes. Furthermore, the plan to increase the overall capacity of London’s transport system includes public-private partnerships for added airport access routes by creating the Docklands Light Railway extension (which already has commenced construction), similar to the Gatwick Express and the Stansted Express provided by BAA.
CHAPTER 7 – The German AiRail: “Zug Zum Flug”23

The Restructured National Railway
The experience of Germany’s railway infrastructure throughout history best resembles a roller coaster ride at an amusement park. The system went from a network of interwoven regions created in the mid nineteenth century to a heavily centralized establishment that later fragmented when the Federal Republic of Germany and the German Democratic Republic both emerged in 1949.24 The fall of the Berlin Wall rearranged the railway system again under a central authority (momentarily), and now preparations for its full privatization are underway.

Railways in Germany faced their most significant alteration with the country’s political division shortly after the Second World War. Rail operations in the Federal Republic of Germany fell under the Deutsche Bundesbahn and in the German Democratic Republic these functions were assumed by the Deutsche Reichsbahn. By 1994, shortly after the country’s unification, both rail operators were merged for a brief period under the General Railway Restructuring Act of 1994 forming a federally owned joint-stock corporation. The final objective, however, is the full privatization of the service by 2004 when the firm is expected to be floated in the stock market. Today Deutsche Bahn AG or German Rail (renamed in 1997 and also known as DB) is the owner and operator of the public rail services and stations in the country (see Figure 17). The public corporation is divided into five business subsidiaries, each focusing on a specific branch of the operation and with an even number of representatives in the group’s Supervisory Board.

23 This chapter is the result of interviews with representatives of Deutsche Bahn and Deutsche Luftansa AG. There were also visits to the facilities in Frankfurt and Stuttgart. Zug zum Flug, in German means: train to the plane.
24 In his book “The Rise of Rail-Power in War and Conquest”, Edward A. Pratt explained with detail how the German government structured its national rail system in accordance to a greater imperial strategy, making it the backbone for an effective military logistics apparatus. France and Russia, like other powers with expansionist interests in the late 1800s, also supported their warfare capabilities through a centrally controlled rail plan. However, they did not suffer the fragmentation Germany did after the defeat of 1945.
In accordance with social priorities set by the Federal government through national policies and legislation, municipal and urban rail operations are also managed by state and local governments responding to DB’s Regio. This creates a national system in the form of a matrix between the separate Landen (major political divisions, equal or resembling states in the United States), allowing fast and convenient travel while contributing to the overall economy and organizational characteristics of all the regions and their stakeholders (Nees, 2001). The Landen have control of regional, local, and non-state owned rail services. For these last ones, however, the Landen must ensure that their fares are adjusted to DB levels.

The stations providing the interface between urban and intercity services are handled by Station&Service. This particular arrangement was already in place in West Germany since the 1970s when the transit infrastructure began to emerge in cities and municipalities. It was then
adopted as the main structure during the 1994 reorganization. As a result, user interface and systems integration has not been a shocking process carried throughout a long period and with multiple parties with conflicting interests. Rather, it was an integrated effort toward a transit system with a social agenda clearly aligned by the federal and local governments which sustained the total cost and maintenance of the railway network. It must be emphasized that of all five business units, only Reise&Turistik is involved in the AiRail. Furthermore, it is the only DB division which operates at profit, meaning that all other branches of the agency are subsidized by the German government.

This organizational setting allowed for a seamless and broad national service almost exclusive to the German state and with direct access to nearly every major airport. Hence, for this and other reasons the OECD and the European Union have found many European nations lagging behind in infrastructure by almost 30 years, justifying the more than half of the European Investment Bank’s resources for countries in the region with infrastructure deficiencies, including transportation.25

Figure 18: The German National Rail Network

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25 Since the 1950s transportation efforts in Europe have been coordinated through the European Conference of Ministers for Transport. It was not, however, until the early 1980s when the member countries devised the Trans-European Networks (TENs) policy in conjunction with the European Community’s Single Market. Free circulation of goods and persons was decisive to implement the Single Market that led to European Union. Thus, differences in quality in transportation systems needed to be addressed immediately. Decades of neglect and under-investment in some countries were seen as a barrier to future economic growth and job creation.
The relevance of the historical evolution of Germany's railway infrastructure with the AirRail service is clear: The effective and reliable connection between airports and rail networks (both local and national) has been a common theme in German public policy. As such, attempts to create a rail product intended for aviation travelers appear more easily feasible in Germany than in other places of the world.

**AirRail and the Plane-To-Train Link**

Before thoroughly explaining the German AirRail, it should be noted that this service is different from London's Heathrow Express, Madrid's metro extension or any other ARRCI considered in this study where check-in facilities are in the same downtown area as the departing airport. AirRail is a unique business model integrating trains and planes resulting from a distinct value creation framework. It is considered in this study due to its service characteristics and the fact that the stakeholders involved coincide with those of the more traditional ARRCI services observed.

AirRail is a service provided by Deutsche Lufthansa AG (Lufthansa, or LH) Germany's flagship airline in cooperation with Deutsche Bahn AG (DB). This effort is the result of two decades of cooperation between DB and the air carrier, after desires from the German national government to promote a truly intermodal service for the public.

The first attempt to create such a service was in a very different institutional environment. In 1982 the intermodal concept was forced by the Federal Republic of Germany, making the Lufthansa Airport Express trains the first long-distance trains from the Frankfurt railway hub to the northern city of Düsseldorf almost 200 kilometers away. Known as the first cooperation between Lufthansa and German Railways, the relationship was somewhat easier due to their affiliations with the government. Both companies were government owned. Nonetheless, Lufthansa did not have sufficient interest in the project and the service, aside from being a
tremendous cost (the rolling stock belonged to the airline), had low ridership and was therefore cancelled after almost ten years of operation26.

Today’s organizational structure is distinct. A Memorandum of Understanding in 1998 led to an Air/Rail Task Force comprised of Lufthansa, Fraport AG (Frankfurt Airport’s owner and operator), and Deutsche Bahn creating the new AiRail service. These firms are all separate in terms of ownership and operation, the first two being private and the last still operated by the national government (as mentioned above). The agreement was based on a governmental effort to bring intermodalism to Germany’s transportation system and further enhance Europe’s continental infrastructure in accordance to the EU’s Trans-European Networks policy. It was also a step toward reducing capacity constraints at Frankfurt International Airport (FRA), the continent’s third largest hub. Working closely with DB and Lufthansa, Fraport with this move sought to shift up to 10,000 short haul flights per year to rail services. This allowed Lufthansa to enjoy the newly available slots created at Frankfurt for a greater number of long-haul flights in their network.

Service Overview

"The cooperation between Lufthansa, German Railways and Fraport in this form is unique worldwide. It sets standards for the networking of rail and air traffic, of transport systems and an efficiently operating hub which supplement themselves with their different strengths…

...Now we can also offer our customers fast and optimal connections from Köln [Cologne] to our hub in Frankfurt by rail. It is a logical extension of our joint project which we initiated on the Stuttgart-Frankfurt route. We want to cooperate with our partners in order to advance our ambitious aim of further integrating the transport systems in a network and in the long term shifting short-range traffic to the rails."

Ralf Teckentrup, Executive Vice President Network Management and Marketing, Deutsche Lufthansa AG

26 In an interview with Lufthansa Chairman and CEO Wolfgang Meyrhuber, it was learned how the carrier perceives the rail effort as “not part of our [Lufthansa’s] main line of business”. Airplanes and airports are the heart of the airline’s work.
In May of 2003 a new AiRail route began operating between Frankfurt International Airport and Cologne Central Station. The service, though similar to the Frankfurt/Stuttgart product, was created on an entirely new high speed track belonging to German Rail. The Cologne service provides sixteen trains a day, with eight in each direction allowing passengers to connect with thirty destinations within the Lufthansa network. The Stuttgart service only provides ten trains daily, with five in each direction and fifteen destinations for passengers to connect. The discrepancy in the amount of connecting flights between the two routes is attributed to the fact that Frankfurt/Cologne is aligned with the air carrier’s airport bank times whereas the Frankfurt/Stuttgart service has not been as efficiently integrated into the airports peak hours of operation due to German Rail’s network limitations. In essence, both have the same characteristics. However, focus will remain exclusively on the Frankfurt/Stuttgart service since it began in 2001 and there are greater resources available for analyzing the system.

The service between Frankfurt International Airport and Stuttgart (downtown) has been fully operational since early 2001. For International Air Transport Association (IATA) purposes, the station at center city Stuttgart has its own airport code 27, ZWS, though it remains a normal rail station under Station&Service’s control. In it there are check-in facilities for the exclusive AiRail service. The check-in space is rented to Lufthansa and the personnel serving there are Lufthansa employees trained and assigned for this unique position. Baggage at Stuttgart is loaded onto the train by German Rail employees and when it reaches FRA, it is unloaded by their personnel and taken to the baggage distribution facility which finally delivers it to the Lufthansa flight. 28 Several high-speed InterCityExpress trains (ICE) operate the ZWS-FRA route. However, just some of these trains are dedicated for the Lufthansa flight (normally five round trip services during business days). Of these trains, one passenger compartment is for

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27 Airports around the world are known by a unique three-letter code, referred to in the aviation industry as the location identifier.

28 It is important to note that ground handling operations in Europe differ slightly from one country to another despite EU efforts to create a free market environment. Frankfurt Airport’s baggage handling is mostly done by the facility operator, Fraport. The implications of this element in the U.S. environment will be discussed later.
Lufthansa’s exclusive use while baggage containers are placed in a separate, closed compartment away from all passengers to guarantee that they remain sterile (in contact solely with authorized personnel). The airline can schedule travelers to use this service only if their minimum connect time at Frankfurt is 45min. In essence, the product exclusively belongs to Lufthansa German Airlines, with some coordination taking place between Deutsche Bahn and Fraport at the city station and the airport since they are the interface points. Specifically, aside from the fact that Fraport covered a portion of the building costs of the new station at the airport, baggage handling is a key point in the relationship between DB and Fraport.

**Facts and Figures**

InterCityExpress trains are an essential part of the DB system, operating in most parts of the country since 1991. They provide hourly services between cities all across Germany, including Switzerland and Austria, traveling at speeds of up to 280 km/h. The train has several first class and second class coaches for the traveling public. But, as was mentioned before, one of these first class cabins is exclusive for Lufthansa’s AiRail customers. AiRail service began in early 2001, with a targeted ridership of 60 per cent. However, when inaugurated, ridership was approximately half, roughly reaching 30 per cent. As the year progressed, more passengers used the service until the events of September 11th, 2001 just six months after the inaugural ceremony. Since then, both Lufthansa and DB have faced the immense challenge of increasing load factors to the 60 per cent target (see Figure 19).

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29 Unlike other trains in the Deutsche Bahn network, market share figures for the AiRail include only the compartment pertaining to the Lufthansa passengers. In other words, though the train carries multiple customers, the figures aforementioned only reflect those travelers with a Lufthansa passenger ticket.

30 Load Factor is a measurement unit standard in the airline industry. It represents the actual utilization of seats in an aircraft.
In all, German Rail can manage the 45min connection time required by Lufthansa for AiRail passengers, baggage remains sterile, customs and immigration at the stations work, and passengers who use it have a satisfaction rate of 95% (Deutsche Bahn, 2002). Marketing the product and allowing for connectivity with the airline’s network have also been successful efforts between the three stakeholders, Fraport, Deutsche Bahn and Lufthansa German Airlines. Nevertheless, the service continues to face serious problems of acceptance and attitude. Germany, like any industrialized nation, is confronted with increasing usage of automobiles and highways. The annual number of passengers traveling through the DB network has continued to drop (OECD, 2002). The main difficulty, however, resides in the image the train has with regards to the airplane. Passengers purchase an airline ticket and
expect to fly on a plane. If they are not informed by the selling agent or establishment, the surprise is shocking and even annoying.

With regards to operating costs, the service is seen as a manageable expense with limited risk for Lufthansa. The carrier now has two stations requiring staffing, materials and resources in one city (the airport and the downtown area), with the personnel at the center city station serving almost an exclusive purpose. They cannot be reallocated or substituted because of the specific training and skills. Baggage liabilities are also increased since, under the Memorandum of Understanding, DB transfers all liabilities to Lufthansa. However, the relationship has remained strong in this sense because the rail operator has responded in accordance to the airline's operating standards.

Despite the low utilization figures, AiRail's ICE trains will continue to be a competing factor in the 1 to 2 hour short-haul travel market. Deutsche Bahn, Fraport, and Lufthansa are already discussing plans for service extensions into Düsseldorf and Nuremberg, cities within this flight range from Frankfurt airport. The enterprise's value added to the airline is simple: the train is still cheaper to operate than a flight from Frankfurt plus the opportunity cost of the used slot at the facility. No other ARRCI service, thus far has created this value to such critical stakeholder. Hence, no other ARRCI service, thus far has generated the commitment of an airline as Germany's Zug zum Flug.
Until very recently, Spain's political and economic environment differed greatly from that of Britain and Germany. It had other trade partners, limited domestic industries, and archaic institutions and systems. This all reflected in the nation's infrastructure and economic capability. When compared to its European neighbors, Spain lagged in transportation services, financial mechanisms, and technological prowess. Even today, the country's market and regulatory framework is behind, affecting such areas as aviation and surface transportation.

Chapter 8 describes the Spanish environment and how it influenced the Madrid airport rail and remote check-in system. Emphasis is given to the ARRCI's creation and current state, where salient stakeholders are closely interconnected. The service has been fully operational since spring of 2002. Therefore, data to evaluate its financial performance is still not available.

A Local Need with National Imperative

At Madrid's historic Puerta Del Sol downtown junction lies the zero kilometer marker uniting eight streets. This spot, in theory, is the geographic starting point of all roads in Spain connecting the metropolis with the countryside, the coasts and its European neighbors. The Iberian Peninsula's shape and the capital's central location serve as the best example of a hub and spoke transportation layout unlike any in Europe, and perhaps the world.

Spain is a constitutional monarchy divided into regions known as Autonomous Communities. Madrid, apart from being the nation's capital and political center, is also an Autonomous Community comprising the city and its surrounding municipalities (see Figure 20). Autonomous communities are under the control of the national government, but enjoy broad political,

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3) The following is based on the historic archives provided by Metro de Madrid, S.A. and by the supporting help from Mr. Javier Aldecoa, member of the organization.
economic, and social freedoms. These freedoms are visible in the exercise of railway management and planning practices, which differ from community to community according to regional needs and available resources. The Community of Madrid, however, is a case in point. Because it was the country’s first subway system, it served as an experimenting ground for the government. What is more, the region’s industrial importance attracted a vast number of immigrants to Madrid and the surrounding towns and villages prompting the national government to closely monitor and control the Community’s public transportation services (Metro de Madrid, 2003).

The Madrid Metro began as a private entity which owned and operated the service and was heavily regulated by the national government (similar to the BAA in the United Kingdom discussed in Chapter 6). By 1955 the small capital comprising less than one percent of the country’s territory had over one and a half million inhabitants, more than five per cent of the country’s thirty million total. The community eventually grew and the national government

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12 Spain is roughly 505,990 square kilometers large. The Community of Madrid is 7,995 square kilometers, roughly one and a half per cent of the country’s total area. Statistical information provided by the Instituto Nacional de Estadísticas (the National Institute of Statistics), INE, shows how Madrid city quickly expanded in
was impelled to change the metropolitan transit institutional framework in 1956. That year it passed the Shared Regime for the Financing of the Madrid Metropolitan Company Act, a law creating a Compañía Metropolitana de Madrid (renaming the old Madrid Metro to Metropolitan Company) with a different funding and control structure. Under this new statute, the Spanish state allowed the local governments to assume responsibility for developing the infrastructure of new metro lines while the Compañía Metropolitano (which remained a private firm with the State having the right to regulate fares and salaries) supplied the rolling stock and operation of the service while receiving an operating subsidy by the national government in accordance to need.

After several attempts to improve the slow and delicate economic performance of the Madrid Metropolitan Company, the national government took control once again in June of 1978 and created an Intervening Council which eliminated the direct participation of the local governments. This situation remained until March of 1986 when the City of Madrid and the Autonomous Community of Madrid regained full control of the Madrid Metropolitan Company from the central government and created an Administrative Council. Ownership of the firm, however, was transferred to the Consorcio Regional de Transportes (Regional Transportation Consortium, CRT), created to operate and develop the transit system under the council’s supervision. In this consortium, the Community of Madrid, the City of Madrid, neighboring municipalities, users, unions, the Spanish government and private firms were all represented. The CRT worked in a fashion similar to the authorities created in London, Paris, Stockholm and Hamburg, having a truly intermodal agenda with the capacity for unified planning and development. Yet, unlike those agencies outside of Spain, the CRT remained within close reach of the nation’s government (Metro de Madrid, 2001).

the years following Spain’s Civil War (1936 – 1939), attracting immigrants from the heartland. For further information, visit http://www.ine.es/.
The CRT was an independent organization with the ways and means necessary for achieving full regional integration. Its charter was to coordinate all the existing local rail systems, fix any deficiencies, and eliminate the excess capacity. To do this, CRT was granted the power to assume and designate functions across the different political entities within the autonomous community. It had its own auditing capability and had control of its own treasury. However, the firm’s legitimacy came from its managerial structure. The entity reported to the community’s Department of Public Works and Transport and to the national government’s Ministry of Industrial Development (Ministerio de Fomento). Board members were senior executives from all levels of government, with the president of CRT being the head of the Public Works and Transport Department. What is more, private sector firms were given administrative and business process autonomy, though without any budgetary freedom.

By 1989, the CRT and the Madrid Metropolitan Company had accomplished a broad series of infrastructure projects connecting the capital with the region and the entire country. The metro operator, however, was heavily dependent on the Ministry both politically and financially. Therefore, it was able to work closely with RENFE, Spain’s national rail operator which functions under the same Ministry, creating important service links at several stations. Only after this relationship was well established did the Community of Madrid and the City of Madrid transfer their remaining stock of the Metropolitan Company to the CRT, leaving the
metro service under total control of the consortium. With this transaction, the company once again changed its name to Metro de Madrid, S.A. but still faced severe economic hardship as the subsidies from the national government didn’t decrease.

When the 1986 contract creating the CRT finally expired in 1990, the financial situation of Metro de Madrid was precarious and uncertain. The improvements in physical infrastructure, service quality and interfaces with other rail services had been achieved but at a very high price. The situation deteriorated when the national government (through a series of reports and initiatives) encouraged the CRT to begin coordinating efforts with the autonomous community’s bus consortium Empresas Madrid Transporte (EMT) to provide integrated fare recovery systems, and to work closely with AENA (Spain’s national airport operator) for a potential connection to the country’s most important gateway, Madrid’s Barajas International Airport. What resulted was the massive Spanish and European commitment to improve the important gateway.

**Line 8 and the Nuevos Ministerios Station**
The Nuevos Ministerios station is located in what is known as the AZCA Urban Project. AZCA, or Association for Commercial Zone A, was part of a broader vision for modernizing Madrid established during the late 1960s under General Franco’s Government. The project’s aim was to create a world-class entry to the heart of the city’s financial district (also known as Madrid’s Manhattan), completing an effort to reconstruct the capital’s image after the terrible Civil War (Carvajal, 1998). Hence, the planning efforts which created a facility for RENFE’s regional network in 1967 and allocated a section of the surrounding land for future railway development were heavily supported by the national government. With time, the station

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33 From 1939 till 1975, Spain was under the dictatorial control of Francisco Franco. Throughout this fascist regime, the Spanish state was strictly centralized in Madrid and remained isolated from Europe and the world. Only after the United Nations Organization recognized the dictator’s government in 1955 did Spain begin to interact with its neighbors.
evolved, including Metro de Madrid’s connections with Lines 6 in 1979, Line 10 in the mid 1980s and Barajas International Airport in 2002 (see Figure 22).

![Metro de Madrid layout](image)

**Figure 22: Metro de Madrid layout. Source: Metro de Madrid, S.A.**

Madrid/Barajas International Airport is Spain’s largest and the fifth busiest facility in Europe. The airport is owned and operated by Aeropuertos Españoles y Navegación Aérea (AENA), a government-owned corporation created in 1991 and also under the regulatory authority of the Fomentation Ministry (as is RENFE). Close collaboration between Metro de Madrid and AENA during the 1990s resulted in the first section of the subway’s Line 8 which extended from Line 4 to the airport. The service, inaugurated in early 1999, provided baggage-friendly trains and stations unique in the metro network and a modern facility at the airport’s Terminal 2 (coincidently, the location of Iberia Airlines’ domestic operations). The Ministry, along with the Autonomous Community of Madrid and the City of Madrid considered the airport connection
project of national significance and went forth with its development, investing over USD300 million (Ministerio de Fomento, 2003).

AENA, Metro de Madrid and the Ministry defined the project a “transnational transportation infrastructure program”\(^{34}\), making it eligible for European Union (EU) funding. After the Spanish government presented the formal request to the EU, Brussels committed to paying more than 85 per cent of the total costs (El País, 2000). In similar fashion, the European Union considered and approved more funds for the project’s full realization, which included the remaining sections of Line 8 from the Nuevos Ministerios Station to the Airport. The downtown remote check-in facility portion of the project was funded by a Service Leveling Fund, created by the autonomous community and backed by the Spanish state. These funds are common throughout Spain and serve as a national financial mechanism to help the thousands of municipalities of the country.

**Service Overview**

Nuevos Ministerios provides a fast and reliable interface between Madrid and its airport. The intermodal facility connects Barajas International with three subway lines, a regional railway line, ten bus routes managed by the EMT, taxi services, and an automotive parking facility with access to the city’s most important highways. Technically, there are two stations at Nuevos Ministerios: one belonging to RENFE and a second one underneath belonging to Metro de Madrid. Metro trains from the station to the airport have headways of 5 minutes and the total travel time is of 12 minutes. The area providing service to passengers headed toward the airport is at the Metro de Madrid station. This “remote check-in” is owned by the subway operator, but its design and specifications are based on AENA’s guide lines for airports used throughout the entire country.

\(^{34}\) Funds for transnational transportation infrastructure programs are provided through the European Structural Funds Policy. This program is intended for infrastructure projects within the member countries of the Union providing the resources for a sustainable economic development beneficial to all of Europe. For further information, visit [http://europa.eu.int/comm/secretariat_general/sgc/aides/index_en.htm](http://europa.eu.int/comm/secretariat_general/sgc/aides/index_en.htm)
On May 6th, 2003 a Collaboration Agreement between the Community of Madrid, the Fomentation Ministry, and AENA was signed marking the beginning of the ARRCI service. Since then, AENA administers all check-in counters using Common Use Terminal Equipment (CUTE), a standard operating practice across all Spanish and many European airports. CUTE run on simple operating systems integrated into Local Area Networks (LAN). They enable reliable communications between airline and airport end-user stations permitting multiple carriers to use a same gate or counter within a limited time-frame. This reduces the costs of ownership to the airlines since the actual equipment at the counter belongs to the airport operator and is rented, for a limited time, to the airline. The arrangement is customary in most European airports, whereas in the United States the predominant setup is that airlines own their gates and check-in counters, and sometimes the entire passenger building (de Neufville & Odoni, 2003).

The Metro-AENA agreement allows the airport operator to manage the facility just as it would any other airport. Therefore, airlines only rent the space for a limited time period and staff the area with their own personnel in similar fashion as in Barajas Airport. Baggage to and from the train is handled by AENA and is responsibility of the airport operator until it is handed to the airline. Spain’s baggage handling market is limited to a few major service providers contracted by the air carriers. It was not until 1994 when the national government liberalized the market, allowing new entrants to compete with Iberia, which provided most baggage handling for domestic and international carriers. Upon arrival to the airport, the baggage is scanned for safety and security purposes by the country’s Civil Guard and is then placed on the airport’s centralized automated sorting system, which distributes most baggage at Barajas International.

There are 34 available counters though with the CUTE systems more or less airlines can be accommodated at any given time. However, since its inauguration in 2002, the facility has attracted a limited number of carriers; mostly domestic operators (see table xx). Service is
provided between 6:30 am and 10:00 pm, and passengers are required to check in no later than 2 hours before their flight.

<table>
<thead>
<tr>
<th>Airlines</th>
<th>Counters Used</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Europa</td>
<td>2</td>
<td>domestic carrier</td>
</tr>
<tr>
<td>Air Nostrum</td>
<td>2</td>
<td>Iberia low-fare carrier</td>
</tr>
<tr>
<td>Alitalia</td>
<td>4</td>
<td>Italian Airline, government owned</td>
</tr>
<tr>
<td>Iberia</td>
<td>2</td>
<td>Spanish Airline, government controlled until 2001</td>
</tr>
<tr>
<td>Ineuropa Handling</td>
<td>4</td>
<td>domestic handler operating since 1994</td>
</tr>
<tr>
<td>Newco (domestic handler)</td>
<td>2</td>
<td>domestic handler operating since 2002</td>
</tr>
<tr>
<td>Portugalia Airlines</td>
<td>2</td>
<td>Portuguese private carrier</td>
</tr>
<tr>
<td>Spanair</td>
<td>2</td>
<td>International low-fare carrier</td>
</tr>
</tbody>
</table>

Figure 23: Airlines at Nuevos Ministerios Station. Data available from AENA, and tabulated by author

**The Iberia Factor and Europe**

Airline deregulation has been present in the aviation industry for over thirty years. However, it was not until the early 1990s (and finally 1997) when European Union nations followed the American initiative and liberalized their aviation markets. A step in this process was the privatization of each country’s flagship carrier. Spain’s Iberia is among the latest national airlines to undergo a public offering. First, the firm was transferred to the Sociedad Estatal de Propiedades Industriales, SEPI (State Group of Industrial Properties) in 1995. This government entity is responsible for managing for-profit state assets which, under EU legislation, must be privatized (SEPI 2003). Afterwards, Iberia slowly gained private capital. Yet it was not until 2001 when the national government’s majority stake was reduced to 5.4 per cent (Iberia, 2003).
The government’s control over Iberia coincides with Metro de Madrid’s ARRCI efforts during the 1990s. What is more, Iberia’s strategy during that time was heavily supported (and outlined) by the national government. Diplomatic activities went hand-in-hand with business initiatives such as the takeover of national airlines in the Americas as Argentina’s Aerolineas Argentinas, Colombia’s Avianca, and Venezuela’s Viasa. As a result, the ARRCI enterprise considers the carrier’s value, creating a service tailored to the domestic traveler flying Iberia. Other modes of transport reach the airport at each terminal (taxi, bus, and auto). Nevertheless, the rail service reaches Iberia’s domestic counters ideally, making the service unsuitable for competitors (see figure xx).

Figure 24: Madrid/Barajas International Airport

Even today, with some foreign ownership and private management, the airline continues to plan closely with national entities, especially AENA. Iberia’s 2003 strategic plan, for instance, clearly specifies how new runways in Barcelona and Madrid (its hub) and investments in air traffic control will enable its growth during the year. Despite the industry-wide benefits these improvements will have, the carrier denotes them as “opportunities” and builds its business
plan around these events (Dupoy de Lome, 2003). Other carriers in Europe and the United States do consider airport expansions and national air system improvements beneficial to their operations. Contrarily, they do not relate these as competitive advantages over other airlines.

Spain’s reality clearly resembles the British and German cases explained in the previous chapters. National interests defined the political forces that empowered and legitimized salient ARRCI stakeholders. It is important to emphasize that the Madrid product is different to the Heathrow Express and the German AiRail. In fact, they all are completely different products. However, the three have similar relationships between airlines, airports and rail operators, where contractual arrangements have defined the institutional setup and strategy pursued in each service. They all include similar technologies and face the same challenges and environments. Other ARRCI experiments continue to be discussed elsewhere, in the United States and in Asia. What they reveal, so far, is not much distinct from what is seen in Britain, German and Spain. But the ultimate success of each case will only become evident as time goes by.
Chapter 8 reviews the ARRCI systems from Section III, observing their present state to extract commonalities and differences for a desired-future state. Each case is an example of intermodal collaboration with similar attributes. However, they all provide different final products to the traveling public: a high-speed dedicated link from a downtown to the local airport, an intercity connection between a downtown and another city’s airport, and a specialized metro line extending from the subway network to the locality’s airport.

The lean principles and practices from Chapter 2, along with the concepts from Chapters 3 and 4, are used for evaluating the three services. Key elements indispensable for the success of future systems will be found and presented. This chapter is outlined by the first phases of the Enterprise Value Stream Mapping Analysis (EVSMA), a tool created and implemented by MIT researchers. Lean thinking has seldom been applied to the transportation services sector and the EVSMA usage in this area is a first. For this reason, the methodology will be modified to fit the research’s needs.

ARRCI Analysis Overview
As mentioned in Chapter 2, the Enterprise Value Stream Mapping Analysis is a tool consisting of eight phases used for improving an existing enterprise. This chapter will use the tool to analyze existing systems and create a guideline for future systems. The cases will be treated as an

35 The Enterprise Value Stream Mapping Analysis (EVSMA) methodology serves as an integrated framework for diagnosing and improving overall enterprise performance, by identifying enterprise-level waste and enhancing the value delivery to enterprise stakeholders. The objective is to optimize the value stream as a critical element in formulating the strategic business plan and transforming it to a lean enterprise.
aggregate group. The results are then generalized and presented as recommendations derived from each phase.

**Phase 1 – EVSMA Setup**

Phase 1 of the Enterprise Value Stream Mapping Analysis states the need to create a leadership team devoted to accomplishing the enterprise goals. The phase also ascertains that this team establishes a boundary for the analysis as well as a quantitative and qualitative characterization of the system. The adapted EVSMA step for this study limited itself to observing how the leadership efforts took place, what their business model was, and what improvements can be sought for future leadership groups. Chapters 5, 6 and 7 provided an overview of the ARRCI enterprise, explaining the historic context, strategic issues and displaying relative data for each ARRCI type.

A leadership group oversees all necessary functions and responsibilities based on their desired goals and available resources. Normally, in an enterprise production value stream the team includes the corporate management of the entity selling the product (Hagel & Singer, 1999). Transportation services, especially intermodal services, bring together multiple management groups each representing the separate organizations with operational jurisdiction over the service. This assembly of transport representatives will be called the *leadership core* of the enterprise. The German AiRail’s leadership core serves as an example. The Memorandum of Understanding created an *AiRail Task Force* comprised of Lufthansa, Fraport and Deutsche Bahn meeting every two weeks to overview the project and discuss its operating technicalities. The firms are separate in terms of ownership, mission and operation, with Lufthansa and Fraport being private entities and DB still managed by the German government. Nevertheless, like Heathrow Express and Metro de Madrid, AiRail began as an effort conceived by a strong national government. A centralized leadership prioritized and enabled all parties to work together despite regulatory changes, privatizations, political cycles and more.
Leadership cores must possess a political will and the necessary tools to succeed in the provision of an ARRCI service. As a unit guiding all stakeholder efforts, the leadership core must:

- Devise an initial system design that includes funding mechanisms such as subsidies, operating revenues and private capital
- Understand and act upon the strategic implications of the decisions made
- Understand how results provide critical direction
- Be familiar with the existing operation and the strategy facilitating changes
- Motivate and outline the roles of all the stakeholders
- Support all stakeholders by allowing them to act as process owners

Heathrow Express, AiRail and Metro de Madrid all possess some form of leadership core. The respective governments enabled an executive body providing the strategy and vision for the endeavor along with an initial system design which includes funding mechanisms such as subsidies, operating revenues and private capital. With time, as the systems took shape, other stakeholders have been incorporated or represented in this leadership core. The decision as to which enterprise member should be a part of the leading team will be discussed later.

In each ARRCI case, the leadership core established necessary elements for the service to operate and succeed. An overview of the most striking features from the three experiences is provided below. No one system covered all these items. Even so, managers and policy makers should give considerable thought to these points in future cases:

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36 In his book “Leading Change” (Harvard Business School Press, 1996), John Kotter distinguishes leadership from management. Leadership skills include establishing direction, aligning people, motivating, and often producing dramatic change. Management, on the other hand, involves the traditional functions planning, organizing and controlling processes in a predictable environment.
1. **Benefit assessment** – It should be clear for all the members of the leadership core that any lean planning efforts should benefit the enterprise by:
   a. Reducing development costs throughout the project
   b. Reducing the risk to stakeholders
   c. Improving the cooperation and value definition for all parties
   d. Increasing revenue returns for system operators
   e. Making the system robust with good service quality (including seamless interface between modes)
   f. Making it a customer generator for rail owners/operators and airlines

2. **Enterprise description** – Airport rail and remote check-in services are dedicated rail service for passengers who wish to reach the airport quickly, comfortably, and economically. To accomplish this, the enterprise must be planned and achieved considering certain boundaries and service attributes:

   a. **Enterprise boundaries**
      i. airport facilities
      ii. guide-way and rolling stock (trains)
      iii. downtown check-in facilities

   b. **Service attributes**
      i. reliable service line with seamless interfaces between the modes, done either as a cooperation of many operators or as a sole operator
      ii. Market segmentation adjusted to transit operator’s cost realities and airlines’ focus on passengers groups (business, economy, etc.)
      iii. Major competitors and market position, such as other access modes to the airport (affected by the catchment area of stations)
iv. Substantial sales volume for the transit operator and the airlines providing downtown service to allow service to break even

v. Workforce make-up and size provided either as an exclusive enterprise workforce for improved interfaces or as a closely coordinated effort among all the organizations involved

**Phase 2 – Stakeholder Value Exchange**

Lean principles focus on value identification, value proposition, and value delivery. This constitutes the enterprise value stream described in Chapter 2. But, unlike traditional value streams or value chain models, the EVSMA’s second phase assesses the multiple exchanges between stakeholders. Thus, identifying enterprise stakeholders and their value propositions ascertains how value is exchanged and if the enterprise meets the desired needs. The figure below, from the EVSMA, serves as a useful description of this important step:

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37 Conventional value chain or value stream theories take the value defined by the end user as the primary driver for the business. This creates a narrow perspective and vision scope for all stakeholders where the value chain does not consider the needs of all other stakeholders (Murman, et al, 2002).
In a normal enterprise environment, the leading firm’s unions, suppliers, leadership and partners would be considered in the value stream analysis. A public/private venture for an intermodal transportation service, however, includes the unions, suppliers, leaders and partners from all the entities contributing to the service. In a sense, there is now double the amount of parties involved. Phase 2 reveals the following generalized value exchange between the parties identified in the ARRCI cases studied:
### Value Expected from Enterprise

<table>
<thead>
<tr>
<th>Value Expected from Enterprise</th>
<th>Stakeholder</th>
<th>Value Contributed to Enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Simple and efficient service</td>
<td>Customers/Airlines&lt;sup&gt;38&lt;/sup&gt;</td>
<td>- Airline Origin-Destination market</td>
</tr>
<tr>
<td>- Affordable operating costs</td>
<td></td>
<td>- Company image</td>
</tr>
<tr>
<td>- Leverage for airport capacity increases</td>
<td></td>
<td>- Multiple destinations for travelers</td>
</tr>
<tr>
<td>- Reliable</td>
<td>End User/Traveling Public</td>
<td>- Service utilization</td>
</tr>
<tr>
<td>- User-friendly (seamless)</td>
<td></td>
<td>- Word of mouth marketing</td>
</tr>
<tr>
<td>- Convenient service</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Career path</td>
<td>Direct Employees</td>
<td>- Productivity</td>
</tr>
<tr>
<td>- Work-life balance</td>
<td></td>
<td>- Tacit knowledge</td>
</tr>
<tr>
<td>- Adequate compensation</td>
<td></td>
<td>- Improvement suggestions</td>
</tr>
<tr>
<td>- Respect/recognition</td>
<td></td>
<td>- Customer service/image</td>
</tr>
<tr>
<td>- Adequate compensation</td>
<td>Sub-contracted Employees</td>
<td>- Productivity</td>
</tr>
<tr>
<td>- Respect/recognition</td>
<td></td>
<td>- Tacit knowledge</td>
</tr>
<tr>
<td>- Work-life balance</td>
<td></td>
<td>- Improvement suggestions</td>
</tr>
<tr>
<td>- Work conditions/compensation</td>
<td>Unions</td>
<td>- Customer service/image</td>
</tr>
<tr>
<td>- Management trust</td>
<td>Leadership Core</td>
<td>- Political activism</td>
</tr>
<tr>
<td>- Fair business practices</td>
<td></td>
<td>- Communication and negotiating capability with management</td>
</tr>
<tr>
<td>- Revenue growth</td>
<td>Shareholders/Appointees</td>
<td>- Capital and risk absorption</td>
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<tr>
<td>- Sustainability</td>
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<td>- Political support</td>
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<tr>
<td>- Benefits to users</td>
<td></td>
<td>- Protection from opponents</td>
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<tr>
<td>- Industry recognition</td>
<td>Partners/Developers/Suppliers</td>
<td>- In-house technology and assessment</td>
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<td>- EPS growth</td>
<td></td>
<td>- Specialized workforce</td>
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<td>- Financial accountability</td>
<td>Airport Operator</td>
<td>- Engineering and development skill</td>
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<td>- Predictability</td>
<td></td>
<td>- Facilities for interface from train to airline</td>
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<td>- Political gain and sound policy</td>
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<td>- Operation support personnel</td>
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<tr>
<td>- Co-development</td>
<td>Train Operator</td>
<td>- En-Route service</td>
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<td>- Trust</td>
<td></td>
<td>- Train schedule planning</td>
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<tr>
<td>- Intellectual Property (IP)</td>
<td>Station Operator</td>
<td>- Facilities for interface from access modes to train</td>
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<td>and knowledge enhancement</td>
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<tr>
<td>- Leverage to retain customers and increase profits</td>
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<td>- Positive social/environment view</td>
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<tr>
<td>- Space/Capacity increases</td>
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<tr>
<td>- Revenues</td>
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<td>- Increased market share</td>
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<td>- Increased revenues</td>
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<tr>
<td>- Greater passenger throughput</td>
<td></td>
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<tr>
<td>- Concession revenue from airlines</td>
<td></td>
<td></td>
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<tr>
<td>38 Airlines are an integral part of the ARRCI when delivering end value to the traveling public. They are treated as customers because most airport rail and remote check-in systems involve airlines as customers contracting a service provided by the rail operator. This group is different from the &quot;end user&quot;, which is the passenger.</td>
<td></td>
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</table>
The table includes most stakeholders and it is based on the three cases used in this benchmark. Each stakeholder will pull (and be pulled) in a separate direction due to their needs and values; therefore, a balance must be sought among the competing parties. Yet balancing the forces between stakeholders can only be achieved when each group’s attributes are properly identified and assessed.

In lean, all stakeholders are important to the enterprise. They contribute with resources in return for an expected benefit satisfying their needs. Power, legitimacy and criticality, as viewed in stakeholder theory, create a hierarchy of enterprise stakeholders. Yet they are not the only characteristics of groups providing services. The German AiRail case of Chapter 5 shows how the customer perception of who is providing the service also becomes an essential attribute. Hence, of all the stakeholders identified, only a few possess all four qualities (See Figure 27).
Figure 27: Stakeholder classification in accordance to stakeholder theory. The groups outlined are definitive stakeholders perceived by the customer as service providers with an associated brand, therefore having all four attributes. They are definitive and visible stakeholders.

The assessment identifies fourteen stakeholders in an ARRCI service. They possess certain characteristics, with some groups having one or two elements while others encompassing all the attributes. The airline, the airport operator, the train operator and station operator are the only groups with all four qualities. They are the visible and definitive members of any airport rail and remote check-in enterprise, meaning that their brand name, interactions and inputs will steer the overall service outcome (Grossi, 2003). This does not mean all other groups are ignored. On the contrary, any assumptions or lack of understanding of their roles is a terrible mistake by the leadership core. Nonetheless, the actions of the dominant and visible stakeholders will profoundly impact and guide the entire system.

In these cases, the organizational structures of the four key stakeholders varied with their environment. However, the groups were under government control at one point in time. It was only in the last two decades that the services were fragmented into public corporations, public/private ventures, and private entities. The U.K.’s British Airport Authority, for instance, owns and operates the airport and the train going between Heathrow and Paddington Station in
two separate business units (Heathrow Airport Ltd. and Heathrow Express Ltd.). This structure is highly complex and regulated by the Competition Commission, with separate rules applying to the different components (regulations for the airport, the rail track, etc.). The opposite of this is Germany’s AiRail, with a much simpler structure. The guide-way, tracks, stations, and trains are all owned and operated by DB business units. This greatly reduces the organizational complexity, limiting all decisions to DB, Fraport and Lufthansa. Madrid, as was observed, is a hybrid case somewhere in between Heathrow Express and AiRail.

The last action in Phase 2 of the EVSMA is to evaluate how the enterprise is performing relative to the values desired by the stakeholders, especially the key definitive and visible stakeholders. This is done with a value comparison template as the next:
Stakeholder Value Prioritization

**Airline Values**
- A1: Simple and Efficient Service
- A2: Low Operating Costs
- A3: Leverage for Capacity Increases at Airport

**Airport Operator Values**
- B1: Future Growth/Profits
- B2: Positive Social/Environmental view
- B3: Space/Capacity increases

**Train Operator Values**
- C1: Operating Revenues
- C2: Increased Market Share

**Station Owner Values**
- D1: Operating Revenues
- D2: Passenger Throughput
- D3: Concession Revenues

Figure 27: Stakeholder Value Prioritization. Source: Discussion with parties and literature review.
Phase 3 – Strategic Objectives
ARRCI systems have major strategic objectives which, if not properly addressed, become major strategic problems. Furthermore, quantifying and providing metrics that can be flowed down to other parts of the organization in a logically and consistent manner can be a complicated task (Kaplan, 2001). The systems reviewed pose the following objectives and problems:

1. **Ridership and revenues** – As noted early in this work, ARRCI market share is substantially low in most parts of the world, impacting operating revenues. Stimulating demand without decreasing fares is the main objective of the enterprise. The provision of subsidies in order to reduce fares is a policy matter of much discussion.

2. **Airline collaboration** – For a remote check-in service to succeed the service provider must have airline support because the persons traveling the route ultimately want to board the airline’s plane, greet someone from a flight, or work at the airport. Baggage handling must work seamlessly and with minimal liability to the parties. Few airlines are comfortable with the baggage handling issue. Measuring airline trust or acceptance can be done by determining the length of contractual agreements between carriers and the service operator, the number of passenger complaints, baggage mishandlings, airline satisfaction, and even the overall consistency of airline schedules with rail services. These indicators must be monitored constantly if they are to reflect changes in airline attitude through time.

3. **Modal competition** – The automobile is a dominant transportation mode in today’s world, making it the airport rail’s biggest challenge. A car is versatile and comfortable for traveling to the airport from any location, at any time, and with many heavy bags. It also provides a strong revenue stream for the airport operator in the form of short-term and long-term parking, something passengers on an ARRCI system would not normally provide. Proving that airport rail and remote check-in is an economically viable alternative for the airport would require quantifying the benefits of reduced space needs for the airport in terms of
parking and car rental facilities. As for the passengers, the comfort of checking in baggage closer to their work or home could help deter the usage of cars.

4. **Capital and operating costs** – ARRCI systems are extremely costly and cannot be funded by one entity alone. Their infrastructure is indivisible, meaning that the project cannot be broken into parts to reduce capital expenses since the service only succeeds when it is highly utilized, with frequent schedules (Salvucci, 2003). Therefore, operating cash flows are essential to sustain the enterprise. Traditionally, large engineering projects (LEP)\(^3\) such as an ARRCI do not recoup their capital costs through the operating revenues they generate in a lifetime (Miller and Lessard, 2000)\(^4\). What is more, the significant operating costs airlines must embrace for an “add-on service feature” further limits the system’s ability to generate revenues.

5. **Seamless interface** – In order to broaden a station’s catchment area and increase passenger throughput, all connections from the customer’s origin point to the airport must be as simple and convenient as possible (IARO, 1998). Potential measurements could be the types of modes available at the station, the number of interfaces between each mode, the time it takes to reach the check-in counters from the drop off area, or other performance data commonly used for econometric analysis of travel behavior and airport passenger buildings.

6. **Brand value** – Product differentiation and reputation usually lead to customer loyalty (Day and Reibstein, 1997). Airline image varies across different market segments. Network carriers label their brand a high end product while low-cost-low-fare carriers are famous for no frills and minimal service. Public rail operators, by themselves, have a different brand

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\(^3\) Miller, Roger and Donald Lessard, *The Strategic Management of Large Engineering Projects* (Cambridge: Massachusetts Institute of Technology, Copyright 2000).

\(^4\) According to Miller and Lessard, LEPs are projects whose complexity, scope and present political and socio-economic context are such that the stakeholders bare intensive risk jeopardizing the project’s future as well as their own existence.
value also. The low-cost-low-fare airline business model does not align with the added service of a remote check-in, whereas the network carrier may find it difficult to affiliate with the rail operator because of stigmas and stereotypes affecting their brand capital.

7. **Institutional setup** – The internal makeup of a firm defines the processes by which it operates on a daily basis. A simple structure with few organizations involved in service provision seems less costly and more efficient since the ARRCI operator can provide a tailored service with little complications for the customer airline and its passengers. Hence, the low organizational complexity of systems as AiRail provides greater process efficiencies because liability, regulatory constraints, and institutional interactions are reduced in the business model. In other words, *too many cooks in the kitchen ruin the soup.*

**Phase 4 – Enterprise Processes**
A simplified and generalized value stream map for an airport rail and remote check-in system is shown below:
The objective of lean principles and practices is to drive waste out of the enterprise. In this case, however, it must be emphasized that the enterprise spans many organizations with different internal components. The easiest way to portray it and seek waste is by defining the service in three sections: the downtown station, the guide-way and train (en-route), and the airport. Many stakeholders exist in each of these blocks. For instance, at the downtown station baggage handling is provided by a contractor, check-in counters are staffed by airlines, security services may or may not exist, concessions are subcontracted, and the station itself is managed by another party. Similar groups exist in the en-route and airport portions, each with their own

Figure 28: System overview of the airport rail connection for passengers from the station to the airport. A similar figure would exist for passengers proceeding in the other direction.
array of players. It is important to note that the airline remains visible and participative in all three sections.

The service output at each section is the passenger and baggage transfer, from station to train to airport to plane. Each transfer is a hand-off between different entities. Thus, for a customer to feel a seamless service the stakeholders must all work in a synchronized fashion. Airlines believe the end service is getting the passenger to their final destination as conveniently as possible. The rail operator believes the end service is getting the passenger to the airport. And the station operator considers good service at the beginning of the journey their objective. All these views must coincide with the general perspective of the passenger, who travels to get somewhere. Therefore, the end value of the enterprise is to see the passenger reach the airport to fulfill a specific need (depart, work, etc.).

Two issues reflected in the value stream map become evident:

1. Queues play an important role in ARRCI service. Hours can be devoted to queuing in different lines waiting for service. When the service is fragmented among too many parties more queues exist, constituting system waste since they do not add value to the customer. The consequence is the passenger’s feeling that they spend more time waiting for the service than the actual service itself requires.

2. Processing times at value added steps (such as check-in, boarding, airline ticket counters, etc.) deteriorate as the communication between agencies increases. Such communication can be an exchange of information, resources and materials and it is usually dependant upon the structural framework created to run the service. Real changes in regulatory and operating setup will reduce this structural inefficiency.
Solving these two bottlenecks requires the alignment of values of all the stakeholders involved in air and rail transportation (government agencies, developers, public and private operators). Once accomplished, the benefits will extend to all the parties and improves the overall level of service so that passengers feel that at every step of the process something is being accomplished.

Value creation will depend on all the stakeholders and how they agree on processes and interactions. What must be emphasized is the importance of four main groups: the airlines, the station owner, the airport operator, and the rail service operator. These four stakeholders have the criticality, legitimacy, power and visibility to make the endeavor succeed.

Phases 1 through 4 summarized the realities of ARRCI systems and demonstrated the main points stakeholders must consider. The final four phases of the EVSMA now take another step. They build on this reality to improve the enterprise. As was mentioned initially in this chapter, there is no service that will be improved. Rather, the objective will be to provide a series of best practices based on what has been observed and gained from past experiences.
Chapter 9 continues the review of Section III's ARRCI systems using a variant of the Enterprise Value Stream Mapping Analysis. Until now, this tool has focused on the current state of airport rail services, extracting common elements from each case and elaborating on these characteristics. Looking beyond, or outbound, is now the purpose of the remaining phases of the EVSMA. Phases 5 through 7 revise critical stakeholders, processes, and interfaces in order to eliminate system waste. The end result, in phase 8, would be an improvement plan for the ARRCI service. However, following the previous need to alter the methodology; this thesis instead concentrates on gathering the concepts learned and creating a general strategy for new systems.

**Phase 5 - Enterprise Interactions**

Definitive and visible stakeholders were first discussed in phase 2 of the EVSMA. For an airport rail and remote check-in system these groups are the airline, the airport operator, the station owner, and the train operator. They all possess power, legitimacy, criticality and visibility, essential characteristics giving them primacy over all other parties involved in the enterprise. The interactions among these groups and how they impact ARRCI service provision are the purpose of phase 5. Among them, information, resources, and materials flow from one end of the value stream to the other, usually without much notice. However, when there are flaws in this interaction, value does not flow well and the consequences immediately reach the passenger.

At this point of the study it is necessary to stop and ask an important question: **Why does a customer use an airport rail and remote check-in service?** Passengers will use an airport rail and remote check-in service for (a) traveling to or from the airport and (b) checking in their
baggage away from the airport provided there is a service for transporting them and their baggage to the airport. In other words, under the assumption that the ARRCI system has none or few intermediary stops (as the AiRail, Heathrow Express, and Metro de Madrid), the only people using such service are those interested in reaching the airport with or without baggage. **Stakeholder interactions, therefore, must exist solely if they help satisfy the customer's ultimate objective of reaching the airport.**

Nevertheless, the passenger goes to an airport for a reason, to board a flight. The flight is a service provided by the airline. Hence, an even more important question emerges: **Where does the flight service begin, at the airport with the airline or at the moment the passenger commences the journey to the airport?** The ARRCI faces this challenging dilemma. And how this question is answered will determine all exchanges and stakeholder relationships.

Asking where the passenger's flight "begins" helps determine the role of stakeholders, especially the airlines in the ARRCI system. Traditionally, as seen in Section III, carriers refuse to participate in any airport rail and remote check-in service because they find no value in joining the enterprise. The passenger will travel with an airline not because it is easy to get to the airport from where the airline departs but because the carrier flies to a given destination and there are incentives to select that one airline out of all available suppliers. Under this stance, interactions between airlines and the rail service provider are limited and any seamless interface instead seems less of an interface. This happens because no communication exists between the two and information and resources are not delivered from one stakeholder to the next. The rail operator receives no input from the carriers regarding the customers it intends to serve. No information is provided as to which flights the passengers are taking, special needs (wheelchairs, food, VIP considerations, language, etc.), their departure and arrival times, or even the baggage limitations.

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41 This axiom is later challenged in this thesis with Continental Airlines' example at Newark International Airport and the New York City metro area.
they must comply with. Such information can be crucial marketing data for improving the train service and stimulating ARRCI ridership.

Remote check-in is a component that requires a further step in the communication process between stakeholders. Baggage handling, aside from increasing the exchange of information, also demands an intense exchange of resources, especially human resources. Checked baggage must go from the counter where it was first dropped off to the train and finally to the airplane. On the way, multiple stops include security prior to loading the train, security prior to entering the airport sorting system, and the sorting system. More stops can be added if the flight route includes international legs or destinations. This means that the airline must work closely with the rail operator and the airport to ensure that the baggage is securely placed on the same flight as its owner. Any faltering in this flow makes all remote check-in efforts futile.

The flows between the airlines, the airport, and the rail operator must be stable, timely, accurate and complete in order to be effective (EVSMA, 2003). When the passenger first reaches the station to check-in baggage, flight and airline information must be available and the system must be capable of handling the baggage accordingly. While on the train to the airport, real-time airline information should be at the reach of the traveler and service amenities must exist to justify the mode selection. Finally, when the train reaches the airport both the passenger and the baggage must continue their journey through the stressful terminal environment. Any failure in one or more of the station, en-route, or airport sections of the ARRCI service will result in an enterprise failure.

Phase 6 – Enterprise Waste

As mentioned earlier, waste comes in many shapes and colors. Fundamental types unearthed in airport rail and remote check-in services, according to lean principles and practices include:
1. **Waiting and delays** - Excessive waiting in queues while reaching the ARRCI station and then the airport. Government inspection and security functions have greatly increased the number of queues and their waiting times as well, especially during high-season travel periods. ARRCI systems would help reduce these queues provided that they serve passengers with security checkpoints at the rail station, then relaxing future inspections at the airport. The tradeoff, however, is the increased operating costs this would cause because of the duplication of functions, a problem similar to what airlines face already.

2. **Excessive transportation** – Unnecessary information transfers between the parties involved, long baggage transfer processes, and too many tickets or travel vouchers for the passengers are types of transportation waste. With so many entities participating in the ARRCI service, information can overwhelm the workforce and clog communication channels. Baggage routes can be cumbersome and inefficient. And passengers face increased “paper in their pockets”, with a ticket for the train, another for the airplane, timetables, station maps, airport maps, etc.

3. **Inventory** – Unnecessary enterprise resources such as train capacity, ticket counters, and schedules. Contrarily, insufficient enterprise resources may also be waste. This includes not enough passenger information, customer service agents, baggage handlers, station space for passenger flows, and more.

4. **Defects and service inefficiencies** – Repetitive cases of lost baggage, double bookings, broken baggage, missed flights, and poor customer service.

The aforementioned categories relate to operational levels of waste and they will be unique to each ARRCI system. However, they all lead to a greater source of waste identified at the strategic planning level of the cases reviewed, structural inefficiency.
ARRCI actors today are increasingly different despite their fundamentals and common heritage. Rail and transit operators have a public agenda whereas airlines (and even airports) are for-profit services. This duality is imminent in the missions of each group and is a source of structural inefficiency because it sometimes reduces the clarity of asset specificity in the transactions taking place. Public transit agencies intend to satisfy the needs of all taxpayers and, often, depend on local government subsidies. At the same time, cities are fiercely struggling with virtual workplaces, globalization and urban sprawl (United Nations Organization, 2001). There is a push to revitalize metropolitan economies through incentives that attract businesses to downtown areas. Airports and airlines, on the other hand, normally disregard the entire issue of how passengers reach the airport grounds and, in fact, prefer that passengers use cars since parking fees are a significant source of revenue useful for future airport development (DeNeufville and Odoni, 2003). What is more, airlines will engage in transaction and negotiations providing them some type of competitive advantage over other airlines in an origin-destination market (something rail operators and airports don’t face in similar a manner).

Ideological differences in ARRCI services lead to organizational complexity which hampers efficient systems architecture. As more public and private entities get involved in the planning and design of an ARRCI service, Pareto efficient allocations disappear while power increases in importance and becomes the predominant driver of the institutional setup. This phenomenon is heavily reinforced with the provision of funds for the investment. Funding sources have the ability to limit contractual specifications of the service, later causing disruptions during the day-to-day operation of the system.

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42 In the period 1975-2000, as overall rates of population growth declined in an increasing number of countries, the number of cities experiencing low rates of population growth rose – with few exceptions as Mexico City and São Paolo. Roughly a quarter of all cities with at least 750,000 inhabitants are estimated to have grown at rates of less than 1 per cent per year. Furthermore, it is expected that during 2000-2015 more cities will experience low rates of population growth, with almost a third projected to have growth rates lower than 1 per cent per year.
Excessive interactions between multiple groups with ideological discrepancies have a great impact on any strategic effort of the magnitude of an ARRCI system. What is more, these large engineering projects are difficult ventures with much at stake. There is a high probability of failure since development costs are high, operating returns are low, and there is little use for them beyond their original intended purpose (Lessard and Miller, 2000). Thus, the crucible is embedded with uncertainties that stress the parties and reduce their competency and logical thinking, especially when there are constant shifts in the formal and informal environment such as in the past few years where the aviation industry has been affected by business cycles, terrorism, health crises, and even restructurings of market legalities.

Centralized planning is perhaps the most important feature of the organizational structure of ARRCI systems. What was observed in all the cases reviewed is that a strong national body will determine the level of organizational complexity in a system by controlling ideological discrepancies among the groups involved and their interactions. The figure below demonstrates this relationship:
Centralized coordination of ARRCI planning efforts will determine the organizational complexity of the system and, hence, the level of structural inefficiency. Madrid’s Línea 8 shows perhaps the most balanced relationship between the two characteristics, translating into very low structural inefficiency whereas London’s Heathrow Express suffered from the full privatization of BAA, British Airways, and even the track operator, spreading decision-making to many parties and increasing the complexity of the enterprise. What happens after the optimal point in this relationship (the valley of the graph) may be a reversal effect. Centralized planning of airport rail systems may very well lead to an increase in organizational complexity if the governing body does not carefully review its operating strategy. Further research of more cases could indicate if the increased centralized planning of ARRCI systems eventually leads to greater complexities and, thus, more structural inefficiency. Due to the limitations of this study, however, the question is left open for further inquiry.
Phase 7 – Future State

The ARRCI descriptions of phases 1 through 4, the interactions of phase 5, and the enterprise level waste identified in phase 6 all lead to the main point of this work: **Airport rail and remote check-in services require intensive planning which, from the start, must consider the relationship between the airlines involved and the rail service operator.**

ARRCI systems are intended to transport passengers and baggage (and maybe even cargo) between a downtown facility and an airport; and these passengers are all related to the airlines flying in and out of the airport. Therefore, any interest in providing a mass transit service for the airlines’ passengers must involve the airlines if it intends to succeed.

Whether ARRCI services are provided by a public entity as Metro de Madrid or a private group as BAA, their efforts are severely damaged if active airline involvement does not exist. But airlines are independent firms and their values often conflict with those of the rail service operator. Getting them to willingly cooperate is a difficult challenge; and getting them to cooperate at the right time is even a larger test. The *train of dreams* myth, where ‘if you build it, they will come’ is certainly flawed and must be abandoned. An airport rail and remote check-in system will not attract airlines or their passengers unless the airlines see value to the endeavor. Furthermore, the value of this endeavor should best be defined at the start of the planning process and not after all capital investments are done. This is because a carefully thought business model must position both the airlines and the rail operator as strategic partners before creating the service. Consequently, future ARRCI systems must observe the airline needs identified in phase 2:

1. **Profit need** – The service must generate additional revenues rather than fragment the existing revenues of the airlines proving remote check-in services. This is done when operating costs remain acceptable and the customer base for the airline in that origin-destination market increases.
2. **Low risk and liability need** – Operational challenges regarding passenger and baggage transfers must be minimized in order to reduce airline liability and the risk of damaging the carrier’s brand name and image.

3. **Airport capacity increase need** – The service must coincide somehow with airline views for airport expansion projects increasing its presence. This is especially important for majority-of-stake airlines, or airlines with the highest market share at a site, operating at their airport hubs.

Based on this, an ARRCI system best satisfies both the rail operator’s interests (be it public policy or profit generation) and the carrier’s needs when there is regional competition between airport hubs and their respective airlines. AiRail is a clear example of this point. Lufthansa understood that its venture with Fraport and Deutsche Bahn could counter the presence of Schiphol Airport and KLM Royal Dutch Airlines in Amsterdam, Brussels Airport with SNBrussels Airlines, and Zurich Airport with Swiss International Air Lines\(^4^3\). Travelers departing from Stuttgart and Cologne have the option of flying with any of the three airlines and connecting at any of their three airport hubs when traveling to a third location. Thus, improving service provision between Frankfurt and the two German cities could only increase the customer base for all the ARRCI stakeholders, satisfying their values and needs. At a smaller magnitude, with shorter distances, the same can be said of multiple airport systems within a metropolitan region. As will be shown in the final chapter of this work, when several airports serve a city or region and they have different airlines flying out of each, the ARRCI service can result in a competitive advantage for carriers trying to increase their market share as long as the service does not exist for *all* the airports and airlines. Alternatively, if it exists for all the airlines, it may be possible to generate motivation among competing airlines to not be left out of an opportunity to improve customer service. This, of course, would require the assumption that

\(^{43}\) Cologne is equidistant to Brussels, Amsterdam and Frankfurt and within ground traveling range. Similarly, Stuttgart is equidistant and within ground traveling range to Zurich, Switzerland.
the carriers are competing equally in a specific OD market and the passenger’s decision depends on the convenience to travel one or another airline.

This is not to say that ARRCI systems cannot successfully emerge without airline involvement. A few cases demonstrate that ridership and operating revenues, regardless of any airline participation, is significant when the rail alternative is indeed the most reliable and convenient transport mode. This, however, depends on geographic and demographic circumstances unique to those cases. For instance, Asian airports in Kuala Lumpur, Malaysia and Tokyo/Narita, Japan both have reasonable load factors. This is mostly attributed to the very high population densities of the cities they serve (IARO, 2003). Similarly, Japan’s Osaka/Kansai Airport and Norway’s Oslo Gardermoen Airport have high passenger counts due to their distances from Osaka and Oslo respectively. The first is a man-made island several kilometers off the coast of Japan and with limited access capability while the second is almost 50 kilometers away from the city in a remote area and isolated area.

All this leads to a lean ARRCI vision where high value alignment among stakeholders and low organizational complexity are the most desired attributes. Represented graphically, an airport rail and remote check-in service would need to be in the upper left quadrant of a two-by-two matrix if it were to increase ridership and operating revenues (see Figure 30). This model would thus explain why AiRail’s results are higher than Heathrow Express’ figures. It also seems to position Metro de Madrid in a slightly advantageous position when compared to the British enterprise, though still not as successful as the German case.
Figure 30: ARRCO typology and classification according to stakeholder value alignment and organizational complexity.

**Phase 8 – Implementation Plan**

The final stage of the EVSMA would provide a road map for improving the existing airport rail and remote check-in enterprise. Obviously, and as was explained, the intention of this research is to seek best practices for future systems based on the ones currently in place. Therefore, the variant methodology for this thesis ends by stressing the different types of waste identified in the cases reviewed and providing some suggestions for their elimination.

1. **Waiting and delays** – Security and other functions can be transferred to check-in and gate agents as long as methods comply with government security protocols. This reduces the number of queues customers face and, though it increases the processing time at the points where service is provided, it gives the impression that something is being accomplished. Unions would have to understand the initiative to improve the value stream of the service
and reclassify job tasks. But, more importantly, security and operational effectiveness must be safeguarded regardless of the need to reduce queues and waiting times.

2. **Excessive transportation** – Standardization of procedures and interactions between the parties can help reduce information, resource, and material flows. Already e-ticketing, CUTE, and computer reservation systems have helped the aviation industry. Such advances should be integrated into the rail operator’s infrastructure. Also, careful design of facilities should be considered, following the practices of airports and other public areas prone to large queues and crowds.

3. **Inventory** – Forecasting is always a difficult subject to approach in any industry, especially transportation services. These efforts should be done in coordinated fashion between the rail operator, the airport and the airlines to reduce variances in their forecasts. Also, the rolling stock (or train) should allow for flexible planning, with seats being available for the different types of customers based on the demand and the type of service being provided. Passenger servicing areas (check-in counters, lounges, etc.) should also have this flexibility so that the airlines can staff the positions based on fluctuating demand. Again, for inventory improvements, standardization of procedures and technologies can help.

4. **Defects and service inefficiencies** – Repetitive cases of lost baggage, double bookings, broken baggage, missed flights, and poor customer service can only be reduced with close monitoring and control. In addition, when revising procedures there should be close communication between front line employees and management. Those involved in the day-to-day-operation are always in the best position to recommend what works and what doesn’t and it is up to management to realize this valuable source of knowledge and reward it properly. This improves the enterprise by empowering the workforce and also sending a positive message to workers that their contributions are essential a good service.
Finally, a methodology for a lean ARRCI enterprise requires reducing structural inefficiencies conducive to operational waste. This is done through a sound strategy involving the definitive and visible stakeholders from the early stages of the planning process. The groups must understand the sense of urgency in committing their efforts to a simple, yet efficient system. Simplicity means facilitating operational and managerial tasks by reducing all interfaces between the parties as well as the number of parties involved. Only this way will the stakeholder feel empowered and be capable of pursuing improvements through time. And when all this is done, the lean, well-seen public transportation enterprise will most likely deliver the value to the end user: the traveling public.
Chapter 11 – Closing Remarks

The past chapters discussed the most pressing issues of ARRCI systems as seen through Lean Principles and Practices, highlighting the importance of key stakeholders and their relationships in order for these enterprises to succeed. The review focused on three European nations all with differences and similarities. But ARRCIs are not limited to the European landscape. Many places, including some in the United States, are considering similar product in the future.

One system under consideration in the U.S. is the Chicago Airport Express (CAE), connecting the city’s O’Hare and Midway international airports with the downtown “Loop” business district. Airport-transit connections between the airports and the Loop already exist and are provided by the Chicago Transit Authority (CTA). The airports are owned and operated by the City’s Department of Aviation (DOA). No remote check-in is currently in place, but there are plans to develop the City’s Block 37 and create baggage check-in facilities for passengers traveling to both airports and for cargo deliveries also. A reason for this study is to apply its findings to the CAE project. Yet to do this, the knowledge obtained from the reviewed ARRCI systems must be assessed understanding the distinct U.S. environment.

This chapter concludes by reviewing the U.S. environment and identifies two main characteristics. It then discusses the Chicago ARRCI system, suggesting a stepped approach intended to create a successful service benefiting all the parties involved. Potential challenges in the CAE are also mentioned. The section closes this thesis with a few words and comments hoping to leave the reader with ideas and potential questions for further research, if desired.

The U.S. is Different
In the United States places as Boston, Chicago, New York City, Philadelphia, San Francisco, and Washington, D.C. all have transit connections to their local airports intending to provide
convenient access for the traveling public. These systems, however, face difficulties and constraints caused by the different institutional, demographic, political, socio-cultural, geographic, and economic characteristics distinguishing the U.S. transportation environment from Europe and elsewhere. Nevertheless, it is the common themes stressed throughout this work’s case studies -- active airline participation and intense political support at the national level -- which seem to be absent almost entirely from the American scene. Thus, while in Germany and Spain (and to a lesser extent Britain) airlines and national governments play a major role, in the U.S. it is not the case.

Active airline participation, for instance, is noted only at one of the aforementioned American cities, New York. New York City’s Airtrain Newark has the consent and support of one air carrier, Continental Airlines. When the development of Airtrain began, the airline’s management considered the product a competitive advantage by which their passenger base could increase since a more convenient connection to “their” airport would capture travelers going to JFK International Airport and LaGuardia Airport (Continental Airlines, 2003). Otherwise to this positive relationship, at other sites (even in New York City itself, with the JFK Airtrain) there has been stiff opposition by airlines, particularly the Air Transport Association, who consider the development of ground access to airports a matter not concerning airports or their tenants (the airlines themselves) since it diverts precious financial resources from other more pressing aviation-related needs (Horowitz, 2003).

In a similar fashion ARRCI services in Europe do not resemble the current airport-rail systems in the United States because of their institutional and political characteristics. The idea behind ARRCI is intermodal service (as defined by the EU TEN policy), and to achieve this there must be intense collaboration between public and private entities along modal lines all benefiting from the product being offered, as discussed before. Traditional planning and operations in the

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44 Continental Airlines is the airline with the largest operation at Newark International Airport (EWR). Recently, the carrier invested nearly $1 billion to refurbish the passenger facilities and supported the creation of Airtrain.
United States reflect an ill-advised institutional framework limiting the efforts for a truly efficient Intermodal system with efficient and seamless interfaces for the passenger. This point was made in 1994, when the U.S. Department of Transportation and the National Commission on Intermodal Transportation (NCIT), intended to promote Intermodalism more thoroughly across the federal, state and local governments, presented to Congress Toward a National Intermodal Transportation System, a report identifying three significant barriers at the federal level affecting Intermodal development: (1) planning and policies do not encourage and accommodate Intermodalism both at the public and private level; (2) funding of transportation programs falls short of authorized levels and is directed modally; and (3) Institutions are organized along modal lines and without public-private cooperation.

Many other differences exist between the United States, Europe, and other parts of the globe. The vast distances between cities in the U. S., the nearly inexistent long-distance passenger train network, the citizen’s affinity with the automobile, and the convoluted national air system (with multiple hubs and airlines making it the most complex aviation arrangement in the world) are just some examples of unique factors impacting airport rail and remote check-in services in North America. However, to elaborate on these would require further time and resource, perhaps even later research to better understand these variables. Hence, only the two most relevant matters identified using the EVSMA in this work are discussed in this final chapter.

The Chicago Airport Express
Despite the differences between Europe and the United States, cities and regions continue to pursue the ARRCI objective for many of the reasons explained in Chapter 9. The City of Chicago and the Chicago Transit Authority are an example of this, with their CAE initiative envisioned to be operational by the year 2006. The current plan includes an improved transit connection between the loop and both airports with an Express train and facilities for downtown check-in services for passengers traveling to and from downtown (CTA, 2003).
Given all that has been discussed, a suggested approach for CTA and the City would be to focus first on the simplicity of the existing service and extend the collaboration toward other key stakeholders progressively. In other words, a simple physical connection already exists with the rail and station operator being the same entity (CTA) and both airports controlled by the same municipal department (DOA). With both CTA and DOA effectively functioning as city agencies, because of this there is only a transit agency modestly coordinating airport ground access matters with the City’s Department of Aviation, keeping organizational complexity relatively low. The first progressive step is to establish a strategic alliance between CTA and DOA, with the relationship focusing on improving the seamless physical interface between the two entities. This would require shared and limited capital investments to decrease walking distances between station and the airport terminals, provide all stops throughout the existing lines with baggage-friendly access points, improving communications and public information displays, and even creating some marketing mechanisms to stimulate passenger usage of the service. This improved existing service does not consider the remote check-in component, however, because airline collaboration is not yet required, but can be the objective of a next two phases.

The second step toward a fully functional CAE with remote check-in demands the involvement of airlines from the early stages of the planning process. Airline relations with CTA must be, at the least, comparable to the existing relationship between the air carriers and DOA with an efficient contract defining service provisions and tight quality controls, costs and liabilities to each side, and even the basic understanding that passengers utilizing the service really are customers of the airlines. Only this way will the airlines feel more comfortable collaborating with “another public agency”. Physical collaboration may not be sought at this level. The second step could simply involve strategies for sharing real-time information, intermodal ticketing (already available with Continental Airlines and Amtrak in the New York area), and streamlining different products for tourists and business travelers not familiar with Chicago. These small, and perhaps insignificant, actions can have a very positive effect on travelers since
it helps save time and effort, reducing stress and improving the travel experience for the passenger, an ultimate objective of all airlines, airports, and transit operators.

The relationship between airlines, CTA, and DOA must guarantee benefits to all the parties, in accordance to their unique needs before pursuing the ultimate level of collaboration where a remote check-in service is actually in place. For this, air carriers need to feel there is a gain in creating a CAE with remote check-in, such as the ability to reduce operating and capital costs caused by building more terminal space at the airport site. DOA must consider the benefit of reducing ground access congestion at its airports to prevent passengers and airlines from diverting to competing regional airports as Milwaukee’s General Mitchell International Airport. CTA, obviously, must find the increased ridership as a greater source of operating revenues. All public policies and private needs must be addressed realistically and in accordance to what each stakeholder truly seeks.

The final step is the most complicated, for it addresses the delicate balance between group needs and individual agendas. The remote check-in of an ARRCI service involves significant capital expenditures and closely coordinated operating procedures in order to work efficiently and effectively. Germany and Spain resolved the capital investment problem with public funds coming from their central governments and Brussels. BAA, on the other hand, raised the funds through equity and debt markets, assuming all risk. Regardless of who assumes the risk, the recovery of the capital cost depends mostly on the quality of the operating procedures, since they can repel or attract passengers. However, as was noted, in all three systems operating cross subsidies are a common theme, meaning that the revenues generated have not even covered the operating expenditures, much less the capital costs. Therefore, when remote check-in services are considered, the harsh truth that what is invested may not be recovered must be kept in mind. All this means that the remote check-in must be devised to perform at its best to increase operating revenues if it is to gain the acceptance of stakeholders and, above all, the traveling public. But here is the most difficult task.
Getting airlines and airport operators to accept the remote check-in despite the negative historic realities of such services is the dilemma of the third step in the CAE example. Government agencies should not, and cannot, force airlines and other stakeholders into participating because the results would be catastrophic, with hostilities between the parties mounting until the ultimate collapse of the service. Therefore, the service planners must emphasize other values gained with the project, as the ones mentioned in Chapters 9 and 10. By finding tangible reasons, other than immediate gain from revenues, the airlines and DOA will have a desire to work with CTA toward the remote check-in objective. And when this is done properly, with the input of all stakeholders from the early planning stages, those advantages gained from creating an ARRCI service – in the end – will all translate into the desired outcomes each party seeks.

CAE Friction
The success of an airport rail and remote check-in system in Chicago will depend on the stakeholders and the quality of their relationships, especially the relationships between key groups: airlines, CTA, and the City of Chicago (DOA and other pertinent agencies). These relationships should focus on eliminating the institutional barriers that limit the flows of information, materials and resources caused by jurisdictional controls of each group. Hence, the Chicago Airport Express needs to have an identity of its own, distinguished as a new and alternative product resulting from the combined efforts of multiple parties. Doing this allows the service to have a leadership core independent of the existing agencies and firms, yet representative of them all, making it capable to move flexibly during decision making and negotiating processes.

To do this, the government agencies involved in ARRCI services must work closely to become permeable matrix organizations. In other words, CTA, DOA and all other related City departments need to better understand the strengths, weaknesses, opportunities and threats each agency has. For instance, until CTA realizes that a major DOA strength is automobile parking and learns how to capitalize on this, the relationship among the two will not improve.
CTA, therefore, could attract travelers using cars to a remote check-in facility where cars can be parked and customers can then use the rail service while distributing the parking revenues with DOA, the ARRCI alternative would receive greater support from both agencies.

The private and public elements of the CAE must agree to collaborate and seek mutual benefit. A strategy without airlines for airport rail and remote check-in services, as was shown, may lead to nowhere. Rather than having a dependency relationship where airlines have all the power to control the success of the enterprise, CTA and DOA must figure how to counter this dependency and transform it into interdependency. This could be accomplished by targeting the CAE product to a captive market, the employees. CTA and DOA’s ability to provide a reliable and convenient service to airlines and their difficult operating schedules could benefit the air carriers and their personnel. In return for this added benefit to their workforce, the airlines could promote the usage of the ARRCI service among its passengers, providing special perks or benefits to their elite travelers.

In any event, each player’s ability to understand and adapt itself to the needs of other players will depend mostly on its desire and ability to do so. Entities planning and working closely on multiple projects, sharing data, interacting at all levels, and even assessing contingency measures will accomplish much more than isolated units focusing only on their side of the system. But to do this, the leadership core must realize that a good collaborative strategy starts with an open mentality for negotiating trade-offs.

9/11 and its Aftermath
The attacks on New York, Pennsylvania, and Washington, D.C. caused a tremendous impact in the transportation community. Passengers now face longer waiting lines, airlines have increased operating costs, and the U.S. Federal government went through its largest restructuring in nearly fifty years. The consequences of the new order are yet to be seen. It will be up to ARRCI planners in America to take this to their advantage. If planning and inter-institutional
coordination is properly sought, the airport rail could be a solution to many of the transportation industry’s problems. Improved ground access to airports with remote check-in services can help decrease waiting times for passengers and ease the congestion at airports, eliminating the “hassle factor” so common today. On the other hand, if planning continues focused along modal components (without airlines, transit agencies and airports communicating), then ARRCI services could transform themselves into a huge risk and even the weakest link of a regional transportation system. Collaboration among stakeholders will, once again, prove the critical point of the ARRCI endeavor.

A Final Note
Airport rail and remote check-in services have a promising future as long as they are carefully planned and operated. The needs and desires of the customers and all other affecting and affected stakeholders must always be assessed in order to provide a true north by which the enterprise can proceed. What was found in Britain, Germany and Spain is that (to one degree or another) there was an integrated transport effort commencing at the national level and extending to the many local and modal branches involved. Only this way was the ARRCI experience achieved. Workers, management teams, planners, policy makers, and even the traveling public all perceived the ARRCI as a needed and useful enterprise based upon their individual needs. Nevertheless, the transportation objective of moving persons and goods from one location to another as conveniently as possible remained the common theme throughout all the efforts which took place.

The realities of the United States are different from those of Europe, Asia and elsewhere, where ARRCI systems are already in place. However, close collaboration between airports and transit agencies, then extending to other stakeholders, until ultimately including airlines in this venture is perhaps the best approach for any community seeking to enhance its transportation system. The plan and experience is there. What ARRCI needs is a little help from its friends.
INTERVIEWS

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