U.S. Postal Service Response to Logistics Disruptions Resulting From Terrorism: Its Effectiveness and Relevance to Other Organizations

by

Christopher J. Hamel
B.S., Business Administration
University of Rhode Island, 2002

Submitted to the Engineering Systems Division
in partial fulfillment of the requirements for the degree of

Master of Engineering in Logistics

at the

Massachusetts Institute of Technology

June 2003

Signature of author_____
Engineering Systems Division
May 9th, 2003

Certified By_____
Yossi Sheffi
Professor of Civil and Environmental Engineering
Professor of Engineering Systems
Thesis Supervisor

Accepted By_____
Yossi Sheffi
Professor of Civil and Environmental Engineering
Professor of Engineering Systems
Co-Director, Center for Transportation and Logistics

U.S. Postal Service Response to Logistics Disruptions Resulting From Terrorism: Its Effectiveness and Relevance to Other Organizations

by

Christopher J. Hamel

Submitted to the Engineering Systems Division
in partial fulfillment of the requirements for the degree of
Master of Engineering in Logistics

Abstract

Following the incidents of 9/11, the FAA imposed new restrictions on cargo to be carried aboard commercial aircraft. This had broad and immediate impact on the U.S. Postal Service, which has long depended on such flights to carry mail, particularly expedited services such as Priority and Express Mail. In fact, the USPS normally utilizes over 15,000 commercial flights daily to transport approximately one quarter of the daily mail volume—over 170 million pieces. In less than 3 hours on that September 11 in 2001, more than 4,500 commercial flights were landed immediately regardless of where they were or where they were headed. It was two days before mail began to move again aboard commercial aircraft, and restrictions persist 18 months later, including one prohibiting any mail weighing in excess of 16 ounces. It is this restriction in particular that most drastically affected movement of the mail.

There are many measures that the USPS has identified and/or undertaken since the onset of the aforementioned situations. Some of these measures were permanent and some temporary. While the USPS is different in some respects from other businesses or organizations in general, there are certainly many parallels as well. In lights of this, there may be valuable lessons to be learned from the experiences and actions of the U.S. Postal Service. By studying these actions--and determining their effectiveness in terms of delivery standards, financial impact, and effect on short and long-term strategy—other organizations may ultimately save themselves time and money by following the example of the USPS.

Thesis Advisor: **Yossi Sheffi**
Title: **Co-Director, Center for Transportation and Logistics**

Acknowledgements

I would like to thank my parents Richard and Elizabeth Hamel, for raising me to believe that I could do anything.

I thank God for my wife, Jennifer--with her love and support I can do anything. She did everything for me but my homework. Honest.

I thank my sister Mary and my brothers Richard, Bill, and Bob for being there for me and being my family no matter what I do.

Thanks to the rest of my family, and friends, who encourage me even when they aren't really sure what I'm doing.

Special thanks to Jim Masters, Director of the MLog Program and
Mark Lehrer (MIT '80) of the University of Rhode Island, for making me believe that I could do M.I.T.

Finally, good luck to my friends and classmates in the MLog Class of 2003. Over the past year I've learned a lot, worked hard and had a great time; you were instrumental in all of that. Thank you.

Table of Contents

1. Introduction

1.1 Mail On 9/11

The USPS normally utilizes over 15,000 commercial flights daily to transport approximately one quarter of the daily mail volume—over 170 million pieces.[10] In less than 3 hours following the terrorist attacks of September 11 in 2001, more than 4,500 commercial flights were landed immediately regardless of where they were or where they were headed. Additionally, following the incidents of 9/11 the FAA imposed new restrictions on cargo to be carried aboard commercial aircraft. This had broad and immediate impact on the U.S. Postal Service, which has long depended on such flights to carry mail, particularly expedited services such as Priority and Express Mail that are moved extensively by air. The more familiar types of first-class mail such as letters and business correspondence (including your bills) are transported differently depending on the distance between origin and destination and the corresponding service commitment. For mail that is destined roughly a thousand miles or more from the point of origin, the service standard is three-day delivery; this mail is flown. Generally speaking, the mail within the thousand-mile radius has a delivery standard of one or two days, and in either case is normally transported by truck. It was two days before any mail began to move again aboard commercial aircraft, and restrictions persisted 18 months later including one prohibiting any mail weighing in excess of 16 ounces. It is this restriction in particular that most drastically affected Priority and Express mail. As Paul Vogel, the USPS vice-president in charge of Network Operations Management said, while "there were contingency plans to move mail in times of network disruption, they were not designed to compensate for the loss of all air networks."[2]

The manner in which the USPS did in fact compensate immediately following 9/11, and perhaps more importantly how they have since planned and rethought their strategy are the subject of this thesis, and will be examined herein. In addition, this thesis will attempt to analyze these findings in order to determine what—if any—lessons may be learned for similar or even widely disparate organizations.

1.2 About The U.S. Postal Service

Although the U.S. Postal Service has existed in one form or another for virtually as long as the United States itself, it is only in recent years that it has taken its modern form; that of a modern, competitive business organization. The vast majority of changes have taken place since the Postal Reorganization Act of 1970, which itself included the seeds of the modern USPS. It was this Act that established the Postal Board of Governors (a de facto board of directors), and the Postal Rate Commission for rate-setting purposes. The latter also involved ending a direct taxpayer subsidy of postal activities, making the USPS self-sufficient. Political appointments were ended, with terms and conditions of employment within the USPS to be established through collective bargaining agreements. The insulation of the USPS internally from political intervention assured a continuity of management personnel, while the Postal Rate Commission providing much-needed adequacy in financing authority. These two aspects formed the basis for the successful evolution into a more conventional corporate entity.

The modern USPS does indeed, in many ways, resemble a large corporation. In fact, the Postmaster General (Jack Potter since June 1, 2001) is also given the title of CEO. It is certainly a large company, with well over 800,000 employees (the second largest U.S. employer after Wal-Mart) and 38,000 retail outlets. These retail outlets

provide services to over seven million customers every day. Three of the USPS' six product lines are actually large and successful enough to qualify for the Fortune 500. These are correspondence and transactions (traditional letters as well as bills, bill payments, etc. garnering $36 billion annually), Business Advertising (including "junk" mail--$16 billion worth) and Expedited Delivery (Priority and Express Mail Services combine to bring in about $6 billion).[10]

It is in the Expedited Delivery and Standard Package Delivery businesses that the USPS most clearly enters the arena of the competitive market. In particular United Parcel Service has seen fit to battle the USPS, both in a competitive sense as well as on Capitol Hill, where UPS actively lobbies and protests what it sees as government intervention in the marketplace. Regardless, it is clear that the USPS not only has become a business—it's big business.

The postal transportation network comprises an operation of a similar scale. The USPS handles over 40% of the total world volume in cards and letter mail. Mail is collected at over 326,000 collection boxes and delivered and picked up at nearly 138 million business, homes, and boxes. It does this utilizing a vast transportation network. This network primarily involves airplanes and trucks, but also includes boats and railroads. The USPS "private" transport and delivery fleet consists of over 215,000 vehicles, which travel well in excess of a billion miles a year.[10]

Until August of 2001, the airlift capacity of the USPS depended almost entirely on the contracting of cargo space on 15,000 commercial flights daily. At that time an alliance was formed with FedEx, which has substantially reduced the dependence on such contracting. This alliance, which is discussed in further detail later, has given the USPS

immediate access to 770 total aircraft—including 288 wide-body jets—which can be devoted to the carriage of mail.[1] This cooperative coexistence between two competing organizations may seem counterintuitive, particularly to postal labor unions that almost without exception protested such an agreement. But it will be shown that this agreement—which in turn allowed FedEx to place "drop boxes" in thousands of postal retail outlets nationwide—was critical to the USPS' ability to weather the post-9/11 storm.

1.3 Supply Chain Disruptions

Given the globalization of business (and indeed, society) and shorter product lives, it has become critical for organizations to optimize management of supply chains that grow longer every day. Today's supply chains span not only nations, but also often oceans or the continents. Clearly, the more elaborate and widespread such a network the more susceptible and vulnerable it is to disruption of any kind. Should these disruptions become protracted (such as the FAA's restrictions on mail cargo) or even permanent, the potential for damage--and thus the need for an effective response—is even greater. Unfortunately, at the same time that business climate has spawned supply chain networks that expand further and further, the political climate of the world has made the possibility of terrorist and similar attacks more and more likely.

Of course, there are other threats of disruption besides those posed by terrorists. For instance, there may be a business-related disruption. Businesses may have a critical supply chain partner who is the sole provider of a particular item or service. What happens if that partner should suddenly go out of business, or is even temporarily unable to fulfill their business obligations? Disruptions may come in the form of natural

disasters such as tornados or earthquakes that destroy physical plant assets, or hurricanes that disrupt shipping and related operations.

Even illnesses become a disruption if they are allowed to reach epidemic proportions. Witness the outbreak of Severe Acute Respiratory Syndrome (SARS) worldwide, particularly in China where it appears to have originated. Since March 2003 thousands of Chinese have been infected with well over 100 reported deaths within the first month of the epidemic. Such an epidemic—particularly in a region which hosts a large part of the manufacturing capacity for companies all over the world—can have devastating results on downstream members of the supply chain.

1.4 Topic Summary

There are many measures that the USPS has identified and/or undertaken since its own "supply chain" was disrupted on 9/11 and thereafter. Some of these measures were permanent and some temporary. While the USPS is different in some respects from other businesses or organizations in general, there are certainly many parallels as well. In light of this, there may be valuable lessons to be learned from the experiences and actions of the U.S. Postal Service. By studying these actions--and determining their effectiveness in terms of delivery standards, financial impact, and effect on employee and customer health and safety—other organizations can ultimately save themselves time and money by following the example of the USPS.

2. Literature Review

2.1 Lack of Prior Research

There has been no significant research or investigation into these issues to date, to the best of my knowledge. Much of the information necessary for this research is available electronically, albeit from a variety of sources. Information on the USPS, its procedures, and counter terrorism efforts are available from the USPS' public web sites and externally available reports, FedEx's web site, as well as a variety of supply chain publications. Another resource will be personal interviews with USPS staff including USPS Vice President of Engineering Thomas Day and Manager of Network Operations VP Pranab Shah. There may be additional perspective and insight gained from my own experiences as a mail handler and eventually an Associate Supervisor of Distribution Operations at the USPS Providence (RI) Processing and Distribution Center from 1997-2002.

While many of the above cited (as well as others) will contribute to my findings, they are ultimately of only limited value due to their disparate nature, both in written focus as well as the organizational/individual biases and agenda of the respective sources. It is the unique purpose of this particular research to gather all of the available information and integrate it into a holistic and comprehensive view of the interaction between government, business and public interests. In particular, questions that will be addressed are as follows:

What were the physical characteristics of the postal transportation network before and after 9/11?

What were the strategies and priorities of this network before and after 9/11?

What were the short- and long-term impacts of the events of 9/11 on postal operations?

How effective were any changes in the network with regard to addressing the immediate impact of 9/11, as well as lessening the impacts of future disruptions? And how, if at all, can other organizations gain from studying the reaction of the USPS to post-9/11 disruption to transportation network operations in both the long and short terms?

2.2 Focus of Study

2.2.1 Changes in the USPS Ground Network

Prior to 9/11 in 2001, the USPS utilized a HASP (Hub And Spoke Program) network for moving first-class mail by surface transportation (truck and rail) between various areas of the country. Roughly 75% of all first-class mail was transported via surface means, with the balance going via contracted space on commercial aircraft. For the expedited product offerings, Priority and Express mail, the split between air and surface transport is roughly 50/50. The HASP operated as a typical hub and spoke system, with hubs located in 13 areas throughout the country. Following what is for the most part conventional demographic wisdom, these hubs were concentrated in the Eastern half of the U.S., with the only exceptions being the Southwest Area HASP, and the Van Nuys and Sacramento HASPs in California. Current HASP/Hub locations are shown in Appendix 4. The Midwest, Plains and some Northern states have no hubs but were instead serviced by the farthest-reaching "spokes" of the Chicago hub as well as the three hubs previously noted as being west of the Mississippi. Over the relatively lightly populated midsection of the country mail was flown back and forth between origins and

destinations in the East and West. In fact, virtually none of the mail for Montana, Wyoming and the Dakotas was serviced by the HASP, but instead carried by direct air or rail.[12]

On September 12, 2001, immediately following the terrorist attacks the USPS moved (in conjunction with FedEx) to mobilize an expanded truck network to compensate for the temporary loss of air capacity. This loss was initially brought about as a result of grounded aircraft and airport closures. Subsequently, however, the USPS was forced to deal with new regulations and restrictions with regard to mail carried on passenger airplanes. According to USPS Vice President of Engineering Thomas Day, "The long term impact was the ban of all packages over 16 ounces from commercial flights. This is a ban that began on 9/11 and is only now being phased out. This had a significant negative impact on both Express Mail and Priority. Surface transportation at distances over 1000 miles was not meeting service standard. Fortunately we had just a few months prior entered a partnership with Federal Express to transport this type of mail, although not to the volumes we needed after 9/11."[11] Therefore, to some extent the expansion of surface transport capacity would be required indefinitely. In the short-term, as stated, this was accomplished in large part by contracting extra surface capacity together with FedEx, who faced problems of their own in terms of restricted access to the airways. FedEx, of course, has its own air fleet, so once airports were reopened and flights permitted they were back in business. For their part, the USPS needed to implement a longer-term strategy. Given that the HASP network was already in place, it was only an incremental increase in expense and difficulty to add hubs to the existing system. As USPS Network Operations Manager points out, "We minimized capital

expenditure on the fixed network by not building it new from scratch."[12] Consequently, truck hub facilities were put in place in Atlanta, Dallas, San Francisco and Los Angeles. More critically, there have been "contingency" HASPs located at Seattle, Denver, Kansas City and the Twin Cities (Minneapolis/St. Paul, MN).[12] This growth of the HASP is particularly appropriate given its history. The HASP was born in Indianapolis in the mid-90's, having been conceived as a device to shift air-transported mail volumes to surface transportation without significantly compromising service standards or efficiency. The goals of the more recent HASP extension are similar, with the exception that the shift to ground transportation is now a matter of necessity—due to FAA and/or airline restrictions, plus the need for a contingency plan--rather than one of simple strategy or choice. For example, the Atlanta Hub had been originally located just 2 miles south of Hartsfield International Airport for the purpose of distributing mail to processing facilities in the Southeast, thereby compensating for the earlier (non-9/11-related) loss of air capacity formerly provided by Delta Airlines. Likewise, the other three locations mentioned—Dallas, Los Angeles and San Francisco—are also cities that boast major airports. It is virtually certain, then, that the USPS will continue to evaluate major postal air hubs as locations for trucking hubs instead. As USPS Vice President of Network Operations Paul Vogel says, "That is volume that has left the commercial air industry and will never come back. Trucks are always less expensive."[5] The aforementioned contingency sites are the final pieces to the surface transportation puzzle. One can visualize the four sites—Minnesota, Seattle, Denver and Kansas City—as the corners of a box that surrounds the "no-man's land" in the Central and Northern U.S. that is not served by existing truck service. (See Appendix 4) Under the present system FedEx

planes carry all air-transported Priority and Express mail volumes, while first class mail flies on both FedEx and commercial flights or is carried within the surface HASP system as determined by the service standards discussed in the Introduction on Page 3. As shown in Appendix 4, the HASP system in its current configuration provides coverage for most of the U.S., with a few already noted exceptions. Therefore, should the USPS lose access to commercial air capacity again as it did starting after the events of 9/11, the only mail affected would be that which is originating or destined for those areas which are exceptions. With the activation of the surrounding contingency HASPs this area could be completely integrated into the national surface network. The USPS has determined through the use of simulations and modeling that the resulting total of 17 hubs are the minimum sufficient to provide complete coverage for the continental United States.[12]

2.2.2 Changes in the USPS Air Network

Despite major changes in ground transportation networks, the USPS still needed a viable air network to sustain normal operations and service standards. One of the main internal consumers of air capacity is the expedited parcel business—priority, Global Priority and Express—which compete primarily with similar offerings from FedEx and United Parcel Service. It is all the more interesting therefore that the USPS sought to fill its air capacity needs through an alliance with FedEx--particularly given that this alliance was conceived and even executed prior to 9/11. Traditionally, the USPS had relied on an average of 15,000 commercial flights daily to meet its needs. While many argued that such a system brings with it a great degree of flexibility in a system where demand fluctuates considerably from one Christmas season to the next, others argue that the cost

of this flexibility is inconsistency from one carrier to the next, and from one day to the next. In fact, mail as a cargo receives a low priority from commercial carriers, and can and will be bumped if the situation (such as excessive luggage volumes) dictates. FedEx aircraft not only will carry the necessary volumes (and in fact are guaranteed a minimum volume) but since they are focused on delivering packages and not people will integrate more efficiently with other modes of mail transportation at either end of the line, be it truck, rail, boat or another plane.

The FedEx alliance allowed the USPS to consolidate multiple smaller shipments into fewer large shipments with what is--with over 650 aircraft (including 288 wide-body jets)--one of the largest airlines in the world. FedEx also provides their existing trademark tracking ability and dependability, features that have been shown by survey to be a high priority with commercial and residential USPS customers alike. The FedEx agreement guarantees the USPS that mail carried by FedEx will be 95% on-time.[1] The potential for conflict between postal and FedEx volumes is avoided through the scheduling of USPS transports primarily in the daytime, when the FedEx aircraft goes virtually unused. Not only does this allow FedEx to maximize utilization of their existing capacity, it should allow them to grow by making the expansion of their air fleet more profitable through the aforementioned improvement in utilization. The benefits to FedEx from their alliance with the USPS are vital the USPS as well because they help insure the long term viability of this and any subsequent agreements, and it is the long-term upon which the USPS is focusing.

Another area in which the USPS is seeking to improve their air network is through improvements in Information Technology. Historically, the USPS spent

hundreds of millions of dollars annually on Information Technology. Relatively recent IT initiatives include the Surface Air Management System (SAMS) and the Surface Air Support System (SASS), both of which were initiated in 2001. SAMS provides mail assignment capabilities, assigning mail to surface and air routes, allocates capacity according to mail class (prioritization) and allows for online maintenance and tracking of transportation manifests. SASS essentially creates a window, a "central visibility database," through which SAMS data, scanned bar-coded data from mail processing facilities, and data from transportation suppliers can be consolidated and managed. In 2002 the Enterprise Data Warehouse was created as a collection and dissemination point for all information contained in SASS.[4]

2.2.3 Network Integration & Alignment (NIA)

The USPS' Network Integration & Alignment (NIA) initiative is a critical component of the entire transportation network in deriving a basic design as well as analyzing network effectiveness and maintaining it under changing conditions. The NIA was proposed in 2002 as a charter to create a flexible postal logistics network that would result in lowered costs both internally and for customers, and improve operational effectiveness including quality of service. The NIA seeks to bring supply chain management concepts to the USPS by lowering costs throughout the chain, from customer to the USPS itself and on to any allied organizations, such as contracted transportation. Through the NIA and its extensive use of sophisticated simulation and optimization tools the USPS will be able to identify opportunities across the chain. These opportunities include facility closing/opening/relocation, assignment of distribution and transportation functions throughout the network both internal and external to the USPS,

and enable the USPS to balance distribution strategies with regard to service delivery standards and logistics costs.

The Mailing Industry Task Force (MITF) originally suggested the concept of the NIA in an October 2001 report. They recognized that the USPS, as the major single player, had to take a leading role in unifying the U.S. mailing industry through recognition of the interdependence between the private and public sector segments of the this industry. Then this single entity had to be optimized, as a whole, using the aforementioned tools. One important issue is determining at what point in the USPS mail "stream" mailings should be launched—or what segments are best served by each of the participants. This not only requires the USPS to reveal its cost structure—which is covered more or less under the Freedom of Information Act anyway—but more notably requires mailers to reveal the nature of their costs to the USPS. This sharing of information entails a level of trust that can be difficult to achieve under the best of circumstances, let alone under the often-adversarial conditions that exist between the USPS and the mailing industry in particular, as well as the public and private sectors in general. The actual extent of this trust and the nature of the force behind it are best characterized by the makeup of the MITF committee, which includes high-level representation from such industry heavyweights as R.R. Donnelley, ADVO, Advance Presort Services, Inc., Capital One, Lockheed Martin, Mid-America Mailers, Quad Graphics, Quebecor World, Time, Inc., Gruner & Jahr and Time, Inc.

By optimizing costs for all parties across the board, the NIA can assure that mailers are not incented to seek alternative methods and technologies to achieve their ends, while assuring them in turn of more stable and predictable rates. Throughout 2002,

the USPS sought and received input and involvement from a variety of postal and mailing industry stakeholders, while data was compiled with respect to all facilities. As of Spring 2003, the NIA has progressed through its first two phases. Phase One was the construction of a system-wide database and the analysis, through computer models, of costs, capacities and volume flows for postal facilities. The Phase Two will be one of optimization, wherein models will be used to assign responsibilities, allocate resources, and "right-size" opportunities.

The formation of the MITF and the implementation of NIA did not occur shortly after 9/11 by coincidence, but it should be noted that the USPS had sought to optimize its transportation procedures prior to these events. The primary differences are those of focus or scope: prior to 9/11 optimization opportunities occurred by looking at reducing the need for other modes of transportation (cost analysis, i.e. truck vs. rail) and analysis of surface lanes with less than full capacity, while since 9/11 network optimization is performed for much the same purpose but the analysis is done using optimization tools that can look at the network as a whole.

3. Methodology

3.1 Data Collection

The focus of this thesis is to study selected activities of the U.S. Postal Service since the terrorist attacks of September 11, 2003 and the disruption of the USPS logistics network that resulted; analyze these activities in order to determine if, and to what extent they were effective in mitigating and /or eventually abating this disruption; and providing an understanding of this situation might be used as a benchmark or learning experience for businesses faced with or wishing to avoid similar disruptions.

Gathering relevant information proved to be either fairly easy due to the high media profile of 9/11 and the USPS, and the availability of information on the latter on government web sites due to the Freedom of Information Act; or rather difficult due to events being so recent that there has been little time for studying long-term effects, and the fact that there is some information that will never be made publicly available because of their proprietary business nature or for reasons of national security.

That being said, information was gathered primarily from the following sources: 1) online media and government archives/web sites, 2) interviews with officials of the USPS, and 3) insight obtained as a result of my own employment in the USPS from 1997-2002 as a mail handler and later an Associate Supervisor of Distribution Operations.

3.1 Bases of Comparison/Analysis

3.1.1 Costs

Three primary metrics used by the USPS—and indeed, most businesses in one form or another—are costs, volumes (production levels), and service. On a cost basis, the

transportation initiatives undertaken by the USPS would seem to be successful. For the first time in 5 years the USPS is on pace to experience lower transportation costs than the previous year. Using reported figures for the fiscal quarter ending February 21, 2003; transportation expenses year-to-date were $1.287 billion, down from $1.358 the same period in 2002. This is a decrease of approximately 5.2%, and about 5.6% below planned levels. (See Appendix 1) This is in spite of the fact that virtually the entire Eastern half of the United States experienced a winter that was more severe than usual. It is also indicative of a continuing trend since post-9/11 transportation initiatives. Transportation cost growth (from year to year) has been shrinking as follows:
1999-2000 10.4%, 2000-2001 7.4%, 2001-2002 1.5%. Also, according to U.S. Department of Energy figures, the average price of fuel for these same periods rose from $1.21 to $1.39 per gallon, or an increase of almost 15%.[8] The FedEx agreement is expected to save the USPS $1.3 billion over the 7-year life of the agreement. Additionally, since moving mail via surface transportation is $.20/pound cheaper than air, the continued expansion and refinement of the HASP system should be expected to lead to further savings.[12]

It is worth noting that although transportation costs are generally around 10% of total expenses, they are between 35-40% of non-labor (compensation and benefits) costs. Since the USPS is primarily relying on attrition to gradually reduce labor costs, it is essential that other costs be managed as effectively as possible.

Cost control is also somewhat hampered by the fact that the USPS is still more of a government service than a for-profit enterprise. Therefore on a short-term tactical level, when a postal facility is forced to choose between cost-effectiveness and

maintaining service standards, service wins out. As an Associate Supervisor of Distribution Operations in a Processing and Distribution Center, I faced these situations on more than one occasion. If a container of mail missed its normal scheduled truck dispatch, that mail would be instead sent by airplane in order to avoid late delivery. Similarly, sometimes an additional vehicle would be dispatched with as few as a hundred letters if the destination had an overnight delivery standard.

It is a perhaps unique dilemma that faces the USPS, where service must be maintained at all costs, and costs minimized by whatever means possible.

3.1.2 Volumes

Mail volumes declined for the first time in 2002 (Appendix 2). While some classes of mail have continued a slight downward trend entering Fiscal Year 2003, total mail volumes have rebounded to show a 3.5% increase since the same period last year. Since the USPS still moves first class mail via commercial aircraft, it is this sector from which any decline in volumes can be expected to be drawn. FedEx is guaranteed minimum volumes in their agreement with the USPS (443,120 cubic feet during the day and 250,000 pounds at night) so any decrease in those mail classes currently carried by FedEx (Express and Priority) will have to be replaced with other volumes. This dynamic coupled with the cost savings of the HASP network relative to carriage on commercial flights should combine to further reduce the reliance of the USPS on commercial aircraft. On the other hand, should volumes in Priority and/or Express increase, FedEx has displayed a willingness and ability to handle extra capacity in both the short (as evidenced in the days following 9/11) and long terms. Increases in other classes of mail can easily be accommodated in the short-term by the flexible commercial air capacity,

and in the long term by the HASP system, which as previously discussed has been built with expansion in mind.

Any attempt to forecast postal volumes must take into account a wide variety of factors: literally tens of millions of customers, both commercial and private, with 1.8 million new customers (delivery points) per year; the growing threat of "electronic diversion" by e-mail, electronic banking and bill-paying, etc.; the growth of the package shipping market in resulting from mail-order and Internet shoppers; as well as the less direct effects of other forces such as competition, government regulations, economic forces, etc. It is this environment that makes the flexibility and balance of the USPS' transportation network not a luxury, but rather a necessity.

3.1.3 Service

There is a somewhat limited amount of data available with regard to delivery service levels for the USPS. Although there is internal tracking of performance in all areas, only first class mail delivery is reported where the public can access the information, at the USPS official web site www.usps.com. All other mail can fall into the realm of market competitive services, and so results are treated as proprietary information. While the USPS does report whether or not service standard goals have been met, no further details are made available.

Performance scores for first class mail are tracked and reported by the independent firm Price-Waterhouse-Cooper, who conduct regular test mailings and monitor subsequent delivery. The USPS has consistently set its goal for such on-time delivery of mail committed to be delivered overnight at 93%. Prior to 2001 the USPS consistently reached this goal. In 2001, with the air transportation network severely

disrupted, only first-class mail committed for next-day delivery reached performance goals with a score of 94%. First-class mail with a 2/3-day delivery commitment attained a score of 84% compared to a goal of 87%. Although Priority Mail performance is proprietary information, the USPS did announce that it had met this goal. These figures illustrate the weak link in the transportation network, as it currently exists. Even under the stresses of post-9/11, the overnight mail—which is delivered exclusively via surface transportation—exceeded its goal. Priority Mail--which was consigned to FedEx just prior to 9/11 with the August 2001 alliance agreement—met its goal. Only the 2/3-day mail—which relies on commercial aircraft—failed to meet goal.[15]

In 2002, however, according to the USPS' 2002 Annual Report, "Despite the operational difficulties we faced this year, we achieved record levels of service. Service levels for Express Mail, Priority Mail and First-Class Mail either matched or set new records since the establishment of independent measures. In addition, overall household satisfaction with the Postal Service is back to or exceeds levels achieved before the past year's crises."[13] Specifically, overnight mail again achieved 94% on-time delivery. 2/3-day delivery rose to 87%.[14] Clearly, quality of service is crucial to the USPS in the competitive environment of today. Whether it is e-mail/electronic banking vs. first-class mail, or United Parcel Service et ux vs. Priority Mail, demand is no longer a given for the Postal Service.

4. Conclusions

For almost two centuries the United States Postal Service, in one form or another, had a simple business model. They provided a service that was essentially a necessity for private citizens and businesses alike. They enjoyed a legal monopoly, and a customer base that was growing at a steady and predictable rate. As a government entity, there was relatively little accountability for service quality or cost control. Then came the Postal Reorganization Act, and in 1971 the United States Postal Service was officially born. Part of this Act served to extend those laws which governed both common and contract rail carriage of the mail so that they applied to motor common carriers as well. The Act also authorized the negotiation of contracts with star route operators and motor common carriers. This provided the framework for what would become the largest and most complex surface transportation network in the world. When the 2001 FedEx alliance gave the USPS access to the largest cargo airline in the world, the resulting synergies were both a challenge to manage and an opportunity to exploit.

On September 11, 2001 the USPS network was impacted immediately and profoundly with the grounding of all commercial flights in the U.S. The next day in conjunction with FedEx the USPS began utilizing trucks to move these millions of pieces of mail—particularly Express and Priority Mail products--as well as those that were continuing to enter the mail "stream." Within two days FedEx had continued partial network service and first-class mail was back on limited commercial flights due to new FAA restrictions, imposed as a result of 9/11. Within 10 business days full-up operations, albeit in a slightly changed form including FAA restrictions and FedEx involvement, had resumed.[2]

In the ensuing months the USPS has continued to use a reduced level of commercial air capacity and the FedEx air fleet, all while expanding the existing HASP surface transportation network. The latter now includes contingency sites to be activated in the event that, for whatever reason, air transportation availability is denied the USPS and the HASP becomes the primary transportation option available. This is in keeping with the growing philosophy of "just-in-case" (as opposed to just-in-time) supply chain measures pervading the business world. As Don Perchard, senior supply chain product manager of Covisint says, "You're never going to be able to plan for every event that can happen. What you can do is build to be as flexible as possible."[6] The USPS seems to have done just that.

The lesson that other business can learn here may not be readily apparent--they don't carry the mail; they don't deliver to every home and business in the country. But the parallels are there, and so is the lesson. Technology has allowed the growth of supply chains that span the nation, and even the world. According to Yossi Sheffi, co-director of the Center For Transportation and Logistics at the Massachusetts Institute of Technology, "The globalization of manufacturing, the explosion of new products, and shortened product life cycles have burdened logistics managers with long supply lines and significant demand uncertainty."[9] It is not just larger organizations that conduct international business. For example, as of 2001 small business (less than 100 employees) constituted 89% of known exporters and shipped 20% of known exports.[7] Larger organizations have larger, more extensive networks and so are more vulnerable to disruption of some kind. Smaller organizations with more compact networks may be less exposed to the threat of disruption but also are less likely to have the resources to

withstand a disruption should one occur. Thus, it behooves all organizations, big and small, to examine the potential for disruption to their network as well as their ability to cope, should disruption occur.

Some may say that in forming an alliance with a company that might be perceived as a competitor, the USPS is robbing Peter to pay Paul. But it is the similarity of FedEx that made it an ideal partner for the USPS—an alliance in which each partner is allowed to exploit the other's strength with a minimum of investment. FedEx gained access to the USPS's massive retail outlet network by placing 10,000 drop boxes for FedEx shipments within 18 months of the agreement and the USPS enhanced its air transportation network, gaining 3.5 million pounds of airlift capacity per day.[3] Another immediate benefit is the more far-reaching FedEx system has added scope to the USPS air network, from 50 to 116 markets at night and from 26 to 84 markets during the day, all while achieving projected savings (over the 7-year life of the agreement) of $1.3 billion.[1] And as Sheffi puts it, "the challenge in creating the required redundancies is to minimize their adverse effects and possibly use them to create value."[9] The USPS seems to have done just that.

The bottom line is that the USPS responded to the effects of 9/11 by revamping not only their transportation network but also their way of doing business, ensuring that the organization would be better prepared—and thus less impacted--by future disruptions. What wasn't so predictable, perhaps, is that the USPS did so while at the same time reducing the growth rate of overall transportation costs (Appendix 1). Simultaneously, service levels (as discussed on page 26) were either maintained at current levels or improved.[14]

The United States Postal Service is so ubiquitous, and has been around for so many years, that in many ways it may be taken for granted. But following the events of 9/11, Americans may never again take anything for granted. It would seem to be certain, at least, that businesses couldn't afford to do so. And so, this may be the lesson that the USPS has to offer all organizations large and small: in order to assure that you will always be at your best—prepare for the worst.

5. References

1.USPS/FedEx Business Alliance Overview. United States Postal Service. January 18 2003; http://www.ribbs.usps.gov/files/mtac/Uspsfedx.ppt

2. Postal Service Recounts FedEx Support To Keep Mail Moving Following September 11 Attacks. Postal News. 18 January 2003; http://www.usps.com/news/2002/press/pr02_074.htm

3. FedEx, USPS Forge Two New Service Agreements. FedEx Investor Relations Financial Releases. January 18 2003; http://www.fedex.com/us/investorrelations/financialinfo/financialreleases/alliance.html?link=4

4. Operational Efficiency Strategy 6: Optimize Transportation and Distribution Networks. United States Postal Service Transformation Plan. 18 January 2003; http://www.usps.com/strategicdirection/_pdf/MeetingTheChallenge.pdf

5. Airlines hurt by mail retrictions, trucks pick up slack. Land Line Magazine. http://www.landlinemag.com/todays_news/Daily/2002/Nov02/111302.htm

6. Jim Ericson. Addressing Supply Chain Disruptions. Line 56. 18 January 2003; http://www.line56.com/articles/default.asp?ArticleID=3015

7. A Profile of U.S. Exporting Companies. U.S. Department of Commerce News. 14 April 2003; http://www.census.gov/foreign-trade/aip/h-edbrel-0001.pdf

8. Retail Gasoline Historical Prices. U.S. Department of Energy. 10 March 2003; http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_history.html

9. Yossi Sheffi. Supply Chain Management Under the Threat of Terrorism. 18 January 2003; http://www.logisticssupplychain.org/articles/pdfs/Terrorism.pdf

10. Postal Facts. United States Postal Service. 18 January 2003; http://www.usps.com/communications/organization/postalfacts.htm

11. Day, Thomas—Vice President Engineering, U.S. Postal Service. Personal Interview. 17 January 2003.

12. Shah, Pranab—Manager, Network Operations, U.S. Postal Service. Personal Interview. 4 April 2003.

13. 2002 Annual Report. U.S. Postal Service. 10 April 2003; http://www.usps.com/history/anrpt02/

14. 2002 Annual Performance Report. U.S. Postal Service. 10 April 2003; http://www.usps.com/history/cs02/

15. 2001 Comprehensive Statement On Postal Operations. U.S. Postal Service. 9 April 2003; http://www.usps.com/history/cs01/c5e.htm

6. Appendices

6.1 Appendix 1

	Year Ended September 30,		
(dollars in millions)	2000	1999	1998
Operating revenue	$ 64,540	$ 62,726	$ 60,072
Operating expenses:			
Compensation and benefits	49,532	47,333	45,596
Transportation	4,709	4,267	4,207
Other	8,751	9,042	7,983
Total operating expenses	62,992	60,642	57,786
Income from operations	1,548	2,084	2,286
Interest and investment income	41	29	44
Interest expense on deferred retirement liabilities	(1,568)	(1,592)	(1,613)
Interest expense on borrowings	(220)	(158)	(167)
Net (Loss) Income	$ (199)	$ 363	$ 550

==========

	Year Ended September 30,		
(DOLLARS IN MILLIONS)	2002	2001	2000
Operating revenue	$66,463	$ 65,834	$ 64,540
Operating expenses:			
Compensation and benefits	51,557	51,351	49,532
Transportation	5,132	5,056	4,709
Other	8,545	9,233	8,751
Total operating expenses	65,234	65,640	62,992
Income from operations	1,229	194	1,548
Interest and investment income	46	35	41
Interest expense on deferred retirement liabilities	(1,601)	(1,603)	(1,568)
Interest expense on borrowings	(340)	(306)	(220)
Emergency preparedness appropriations	179	—	—
Emergency preparedness expenses	(189)	—	—
Net Loss	$ (676)	$ (1,680)	$ (199)

6.2 Appendix 2

Mail Volumes

(IN MILLIONS OF UNITS INDICATED)

Class of Mail		2002	2001	2000	1999*	1998
FIRST-CLASS MAIL						
	Pieces, number	**102,378.6**	103,655.6	103,525.7	101,936.5	100,434.2
	Weight, pounds	**4,283.6**	4,362.8	4,392.0	4,299.9	4,151.3
	Revenue	**$ 36,483.2**	$ 35,876.0	$ 35,515.9	$ 34,933.2	$ 33,861.2
PRIORITY MAIL						
	Pieces, number	**998.2**	1,117.8	1,222.5	1,189.5	1,174.4
	Weight, pounds	**1.875.1**	2,149.7	2,352.3	2,142.6	1,980.0
	Revenue	**$ 4,722.5**	$ 4,916.4	$ 4,837.1	$ 4,533.3	$ 4,187.4
EXPRESS MAIL						
	Pieces, number	**61.3**	69.4	70.9	68.7	66.2
	Weight, pounds	**59.1**	72.1	80.0	78.3	77.7
	Revenue	**$ 910.5**	$ 995.7	$ 996.1	$ 942.0	$ 854.5
PERIODICALS						
	Pieces, number	**9,689.8**	10,077.4	10,364.8	10,273.8	10,316.8
	Weight, pounds	**4,006.1**	4,408.3	4,720.3	4,482.6	4,451.1
	Revenue	**$ 2,164.9**	$ 2,205.2	$ 2,170.7	$ 2,115.3	$ 2,072.3
STANDARD MAIL						
	Pieces, number	**87,230.6**	89,938.4	90,057.1	85,661.7	82,508.1
	Weight, pounds	**10,315.5**	10,822.2	11,142.6	10,648.3	10,376.8
Revenue		**$ 15,818.8**	$ 15,704.9	$ 15,193.3	$ 14,435.8	$ 13,701.7
	TOTALS* **					
	Pieces, number	**202,821.9**	207,462.6	207,882.2	201,643.5	196,904.7
	Weight, pounds	**24,562.7**	25,975.9	26,840.6	25,562.2	24,812.3
	Revenue	**$ 63,761.1**	$ 63,425.2	$ 62,284.3	$ 60,417.8	$ 58,032.9

** Certain reclassifications have been made to previously reported international amounts.*
*** Includes foreign postal transaction revenue.*
**** Agency and franked mail are included in their classes of mail, when using official mail.*
Some totals may not add exactly due to rounding.

6.3 Appendix 3

Mail Volume - Mail Revenue

(Data in Thousands)

CATEGORY	CURRENT PERIOD AP 02 FY 2003	CURRENT PERIOD AP 02 FY 2002	% SPLY	YEAR-TO-DATE AP 02 FY 2003	YEAR-TO-DATE AP 02 FY 2002	% SPLY
FIRST-CLASS						
VOLUME	7,667,654	7,745,295	- 1.0	15,297,287	15,542,483	- 1.6
REVENUE	$ 2,874,447	$ 2,719,167	5.7	$ 5,742,347	$ 5,452,469	5.3
REV/PC.	0.3749	0.3511	6.8	0.3754	0.3508	7.0
PRIORITY-MAIL						
VOLUME	64,591	77,674	- 16.8	133,350	152,855	- 12.8
REVENUE	$ 339,615	$ 358,756	- 5.3	$ 694,671	$ 698,325	- 0.5
REV/PC.	5.2579	4.6187	13.8	5.2094	4.5685	14.0
EXPRESS MAIL						
VOLUME	4,225	4,647	- 9.1	8,640	8,916	- 3.1
REVENUE	$ 67,591	$ 67,702	- 0.2	$ 137,715	$ 129,841	6.1
REV/PC.	15.9979	14.5690	9.8	15.9392	14.5627	9.5
PERIODICALS						
VOLUME	770,731	820,002	- 6.0	1,512,067	1,536,895	- 1.6
REVENUE	$ 192,487	$ 182,273	5.6	$ 379,449	$ 348,647	8.8
REV/PC.	0.2497	0.2223	12.4	0.2509	0.2269	10.6
STANDARD MAIL						
VOLUME	8,811,737	7,819,128	12.7	16,385,324	14,934,152	9.7
REVENUE	$ 1,660,176	$ 1,414,487	17.4	$ 3,112,898	$ 2,700,466	15.3
REV/PC.	0.1884	0.1809	4.1	0.1900	0.1808	5.1
PACKAGE SERVICES						
VOLUME	88,105	84,763	3.9	171,702	167,654	2.4
REVENUE	$ 174,293	$ 161,738	7.8	$ 337,912	$ 320,297	5.5
REV/PC.	1.9782	1.9081	3.7	1.9680	1.9105	3.0
INTERNATIONAL						
VOLUME	68,207	81,749	- 16.6	140,442	152,691	- 8.0
REVENUE	$ 122,123	$ 132,869	- 8.1	$ 245,255	$ 248,123	- 1.2
REV/PC.	1.7905	1.6253	10.2	1.7463	1.6250	7.5
ALL MAIL _1/						
VOLUME	17,514,876	16,698,409	4.9	33,728,008	32,596,119	3.5
REVENUE	$ 5,430,812	$ 5,037,129	7.8	$ 10,650,404	$ 9,898,403	7.6

6.4 Appendix 4

Postal HASP Network