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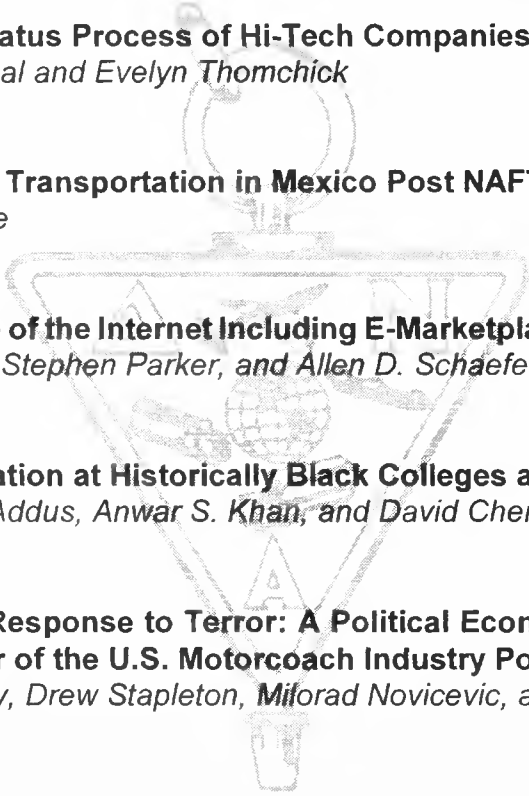
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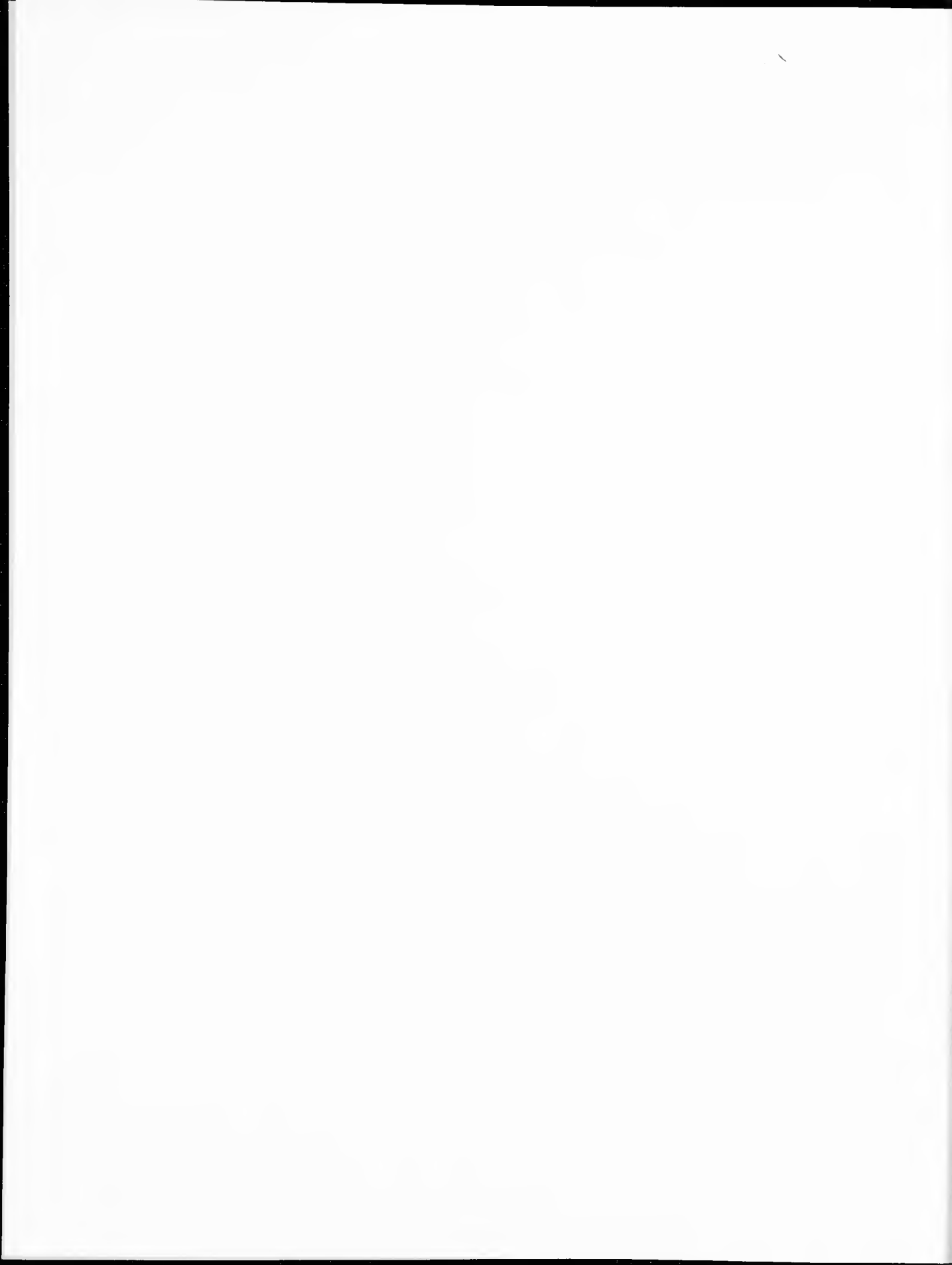


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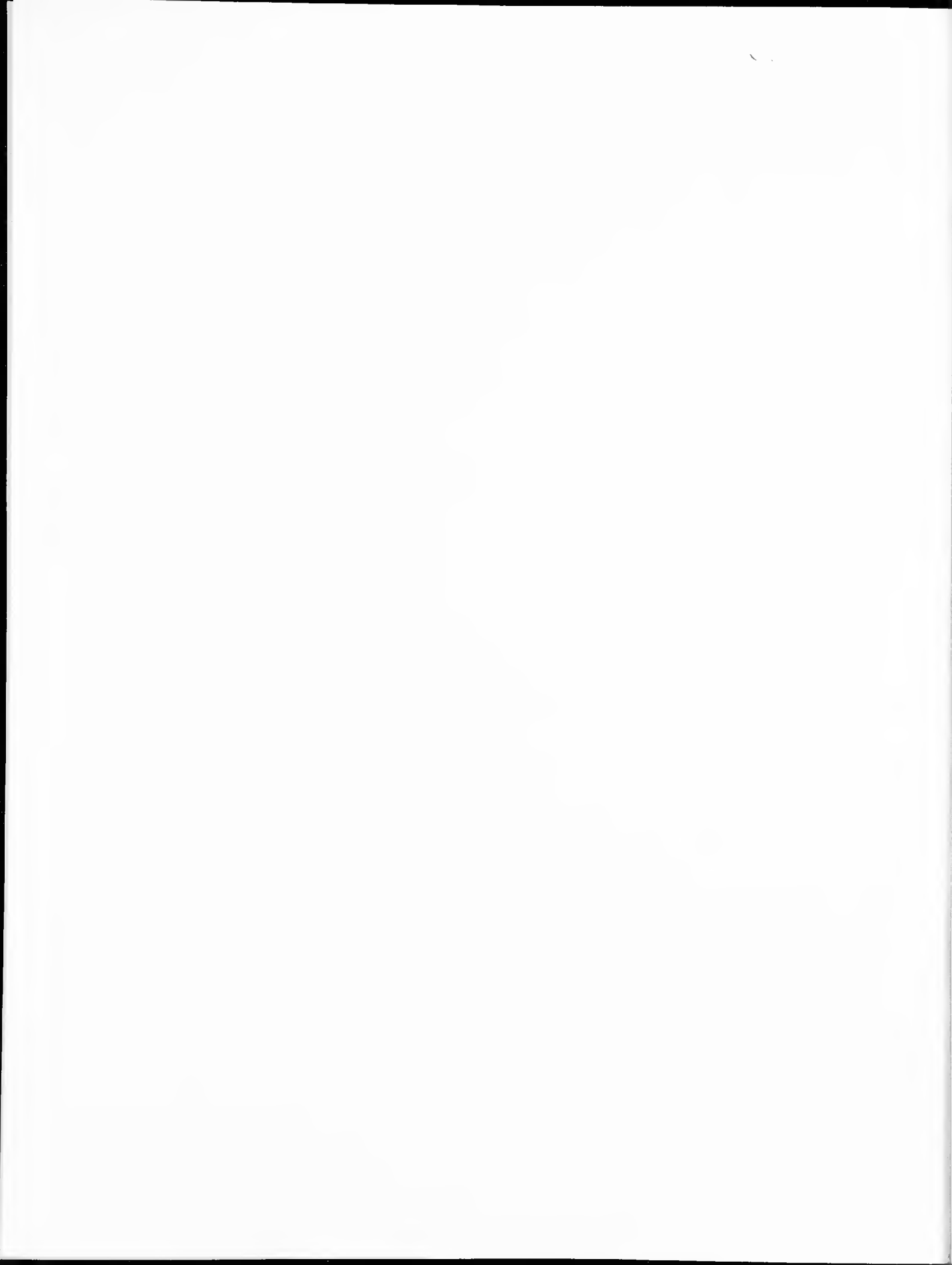
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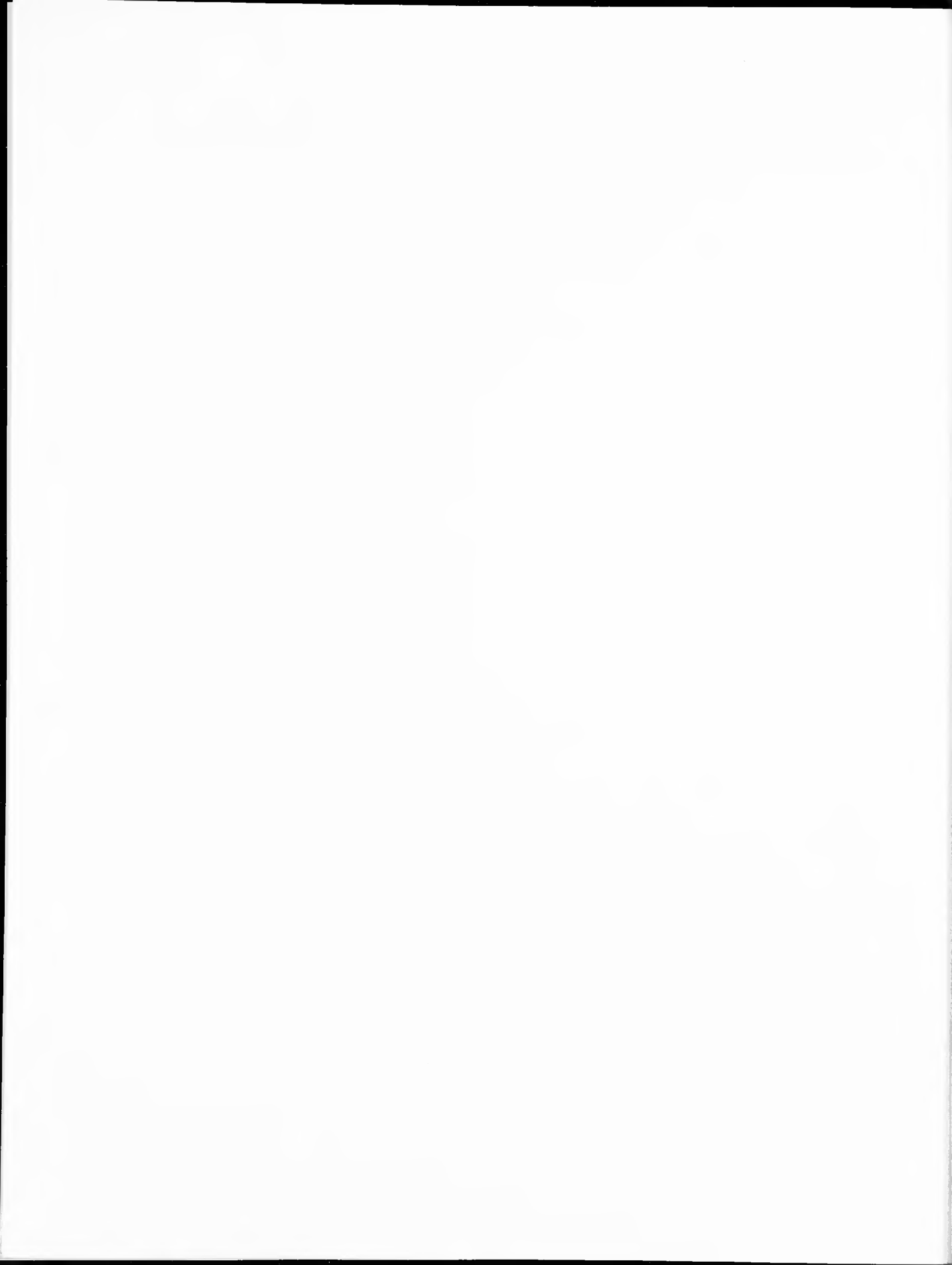
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From the Editor...

At the time of this writing, we have been at war with Iraq for one week. I am hopeful that the fighting will have ceased by the time you receive this issue of the *Journal*. The news coverage of the war—the most intense of any armed conflict in history—brings fresh examples daily of the importance of logistics and transportation to the successful implementation of a military campaign. I share this information with my students in the classroom as often as possible. The impact is immediate and noticeable. They are eager to find applications of classroom and textbook material in a series of events that are occurring in real time. I hope that they realize the tie between their freedom to be in my classroom and discuss these issues and the rising casualty count among coalition forces in Iraq.

In continuing with the theme of the last several issues of the *JTM*, variety defines this issue as well. The lead article in this issue, by Jatinder Chahal and Evelyn Thomchick, presents the results of a study assessing order status and track/trace systems in a set of high-technology firms. It appears from their work that the evolution of such systems is still very much under way in this country. The second article, by Richard Clarke, looks at significant changes that have taken place in surface freight transportation between the United States and Mexico since the signing of NAFTA. In the third article, John Kent, Stephen Parker, and Allen Schaefer report on a survey they conducted involving more than 2,000 shippers. The survey assessed shipper involvement in e-marketplaces and their utilization of trucking company web offerings. They were also asked to rank the importance of a number of web services offered by trucking companies. The fourth article, by Abdussalam Addus, Anwar Khan, and David Chen, analyzes logistics program offerings at historically black colleges and universities in the United States. They offer suggestions for expanding the number of such programs and increasing the availability of logistics-trained minority graduates. In the final article, Kathryn Ready, Drew Stapleton, Milorad Novicevic, and Tom Kuffel present a very unique analysis of the owner/operator sector of the U.S. motorcoach industry, following the tragic events of September 11, 2001. Some of their findings should have direct applicability in other sectors of the transportation industry as well.

Much effort went into each of these works, both by the authors and by the participating editorial board reviewers. I hope that you appreciate these efforts and enjoy the reading.

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Journal of Transportation Management

OBJECTIVES

Editorial Policy. The primary purpose of the *JTM* is to serve as a channel for the dissemination of information relevant to the management of transportation and logistics activities in any and all types of organizations. Articles accepted for publication will be of interest to both academicians and practitioners and will specifically address the managerial implications of the subject matter. Articles that are strictly theoretical in nature, with no direct application to the management of transportation and logistics activities, would be inappropriate for the *JTM*.

Acceptable topics for submission include, but are not limited to carrier management, modal and Intermodal transportation, international transportation issues, transportation safety, marketing of transportation services, domestic and international transportation policy, transportation economics, customer service, and the changing technology of transportation. Articles from related areas, such as third party logistics and purchasing and materials management are acceptable as long as they are specifically related to the management of transportation and logistics activities.

Submissions from industry practitioners and from practitioners co-authoring with academicians are particularly encouraged in order to increase the

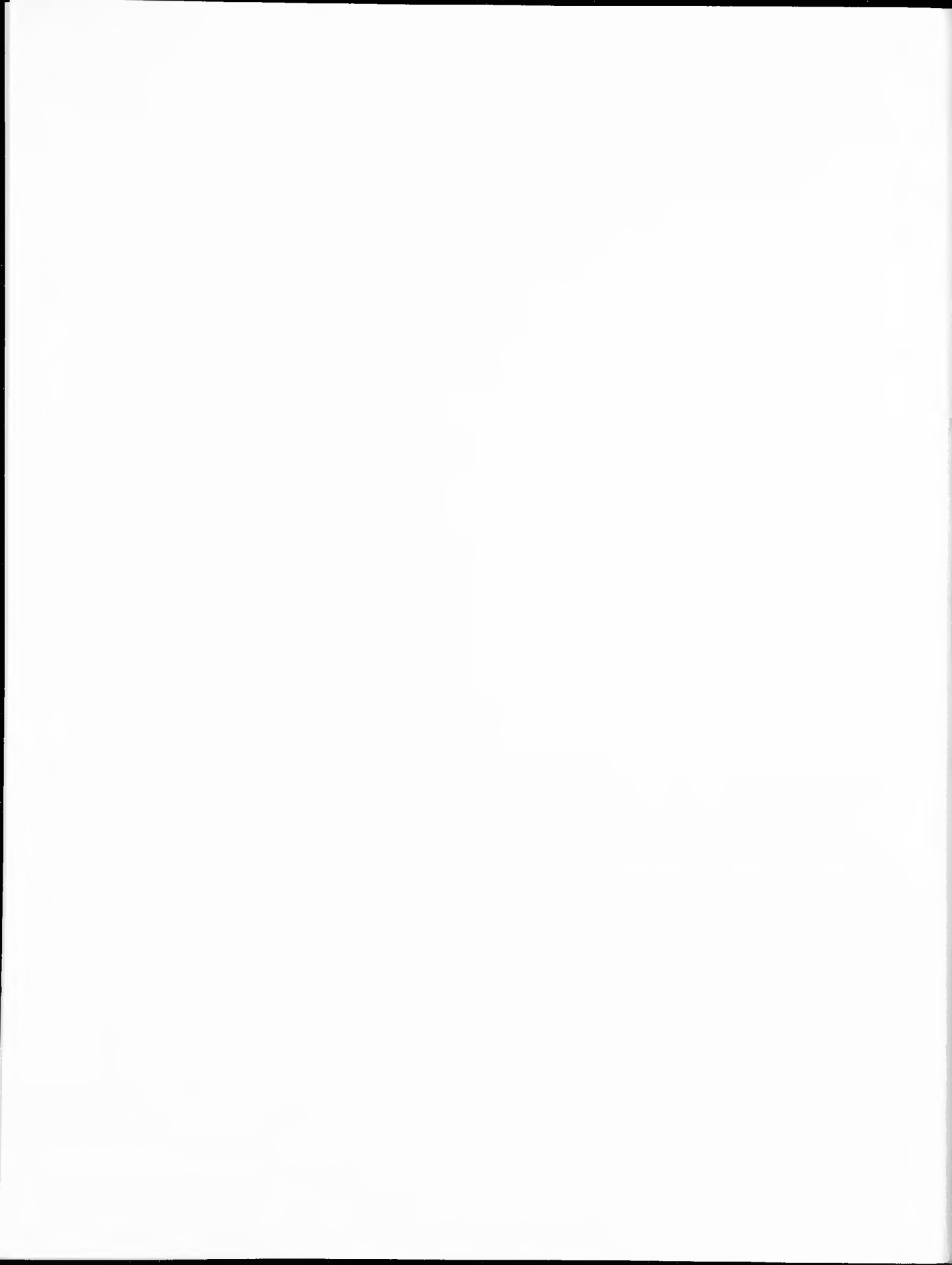
interaction between the two groups. Authors considering the submission of an article to the *JTM* are encouraged to contact the editor for help in determining relevance of the topic and material.

The opinions expressed in published articles are those of the authors and do not necessarily reflect the opinions of the Editor, the Editorial Review Board, Delta Nu Alpha Transportation Fraternity, or Georgia Southern University.

PUBLISHING DATA

Manuscripts. Four (4) copies of each manuscript are to be sent to Dr. Jerry W. Wilson, Department of Logistics, Georgia Southern University, P. O. Box 8152, Statesboro, GA 30460-8152. Manuscripts should be no longer than 25 double-spaced pages. Authors will be required to provide electronic versions of manuscripts accepted for publication. Guidelines for manuscript submission and publication can be found in the back of this issue.

Subscriptions. The *Journal of Transportation Management* is published twice yearly. The current annual subscription rate is \$50 domestic and \$65 international in U.S. currency. Payments are to be sent to the editor at the above address.



GLOBAL ORDER STATUS PROCESS OF HI-TECH COMPANIES

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ABSTRACT

This paper focuses on the *global order status process* of high-tech companies. An effort has been made to understand how these companies approach their *global order status process*. Similarities and differences in their order status process are given. A brief history of tracking and tracing capabilities is also presented, highlighting FedEx and UPS. Some new trends in track and trace are also discussed.

INTRODUCTION

Providing order status information to a customer is important for a company's success. A simple advantage a company gains by providing such information is *satisfied* customers. Having state-of-the-art *order status* and *track and trace* systems may improve channel satisfaction and increase customer loyalty, which can significantly affect a company's revenue and net income in both the short and long run. In this e-business era, as more and more people begin to shop online, it will become important for companies to provide their customers with reliable order tracing systems which provide real time and accurate information. Track

and trace systems have become almost mandatory for companies in the package delivery industry and it's likely that customer demand will require all companies to provide an all-time visibility of the product that the customer ordered online (or similarly by phone or catalogue).

The study described in this paper was originally conducted as a bench marking study, which compared one company against similar companies in the same high technology industry on their order processing and tracking systems. The results were generalized and synthesized into an overview of order status processes. Managerial implications from the perspective of the buyer and

the seller are also discussed. The companies included in the study were large computer or computer equipment manufacturers.

ORDER STATUS/ TRACKING CAPABILITIES

Tracking is defined as a carrier's system of recording movement intervals of shipments from origins to destinations (April 2002, <http://www.agship.com/logisticsg3.html>). Tracing is defined as determining a shipment's location during the course of a move (April 2002, <http://www.agship.com/logisticsg3.html>).

Order status refers to the current status of the order placed by a customer (March 2001, private communication with a company contact). Order status tells a customer at which stage his order is (from ordering to delivery). In some cases it gives information regarding when the order will proceed to the next stage. It may contain information regarding expected delivery date, copy of the invoice, etc. Some common stages that define order status are: order received, scheduled for production, at manufacturing facility, produced, ready for delivery and delivered. This information can be provided through a secure network over the Internet or by calling customer service representatives of a company over the phone.

When a customer buys a product, he or she is typically given an ID number. The customer can then use the ID number to find information regarding the status of his/her order. Usually the last stage for any order status process is *ready for delivery*. When an order is ready for delivery, the company will usually provide a tracking number (which is provided to the company by their service delivery partner), to the customer. From this point, the customer starts to track the product rather than enquiring about order

status. UPS defines tracking number as a number that is used by UPS to identify and trace every package as it moves through the UPS system to its destination. According to UPS, the customer can use this number to track, locate and verify arrival of his/her package, as well as other details.

The difference between order status and track and trace is that order status is an inquiry by the customer before the order has left the manufacturing facility whereas track and trace is an inquiry by the customer to find out where the product is in the delivery process. It should be kept in mind that the customer might use the web site of the company that manufactured the product to track the product also. Many companies provide a direct link to delivery partner's web site's or have some sort of interface where tracking information is stored (March 2001, private communication with a company contact). Other companies provide the tracking number, given to them by their delivery partner, like FedEx or UPS, and direct the customer to the partner's web site to track the product. In other cases, e-mail notification containing the tracking number is sent to the customer. In the e-mail, a direct link is provided to both the web site of the company that manufactured the product, and the company that is delivering it. If the product is custom made, this service can be all the more important as the customer will be able to see order status information or make changes to the order (for example an upgraded CPU or a bigger monitor) long after actually ordering it.

When dealing with corporate orders, it becomes necessary to provide order status information so that the business receiving the order is able to manage its inbound logistics efficiently. Even when an individual customer buys online, he/she is interested in knowing when delivery will occur in order to

be at home when the product arrives. Also, since the tracking number provides information regarding when the product left the origin, it creates a sense of security for the receiver that the product is on its way.

THE EVOLUTION

Express carriers have invested in sophisticated information technology systems that provide precise tracking information and thus help to predict and avoid potential service disruptions (Balasubramaniam, Werwaiss and Ransom, 1999). Although carriers reserve their best solutions for their largest customers, information technology has made it possible for even casual users of parcel-shipping services to gain access to sophisticated information services (March 2001, <http://www.manufacturing.net/magazine/logistic/archives/1997>). Providing these sophisticated tracking systems is a relatively new practice, propelled by the advent of Internet.

The industry that can be given credit for initiating sophisticated tracking systems is without a doubt the express package delivery industry. The main players in this industry are FedEx, UPS and DHL Express. The company that laid the foundation for providing track and trace information to the customer is FedEx. In 1979 FedEx launched FedEx COSMOS® (*Customer Operations Service Master On-Line System*), a central computer system that manages vehicles, people, packages and routes, and tracks weather conditions. The only option a customer had at that time to track the product was to call a customer service representative. Often, the customer service people didn't have the updated information since the technology was not very sophisticated.

In 1992, Federal Express introduced *Tracking Software* allowing customers to track and trace their packages from their own workplaces (March 2001, <http://www.iccuk.net/b2b/fedex/pages/1990.html>). The customer had to install the software on his/her computer before using it. In 1994, FedEx launched its web site (www.fedex.com) and became the first company to offer instant online package status tracking (March 2001, <http://www.fedex.com/us/about/corporation/timeline.html>). Any customer can go online, enter the tracking number, and get real time tracking information. This was considered to be a significant development for the package delivery industry and laid the foundation for a large amount of value-added services.

At about the same time in 1994, when FedEx put its web site online, the UPS web site (www.ups.com) went live. In the mid-1980's, as with FedEx, the only option the UPS customer had to trace an order was to call customer service. By 1993, UPS was delivering 11.5 million packages and documents a day for more than one million regular customers (March 2001, <http://F/www.ups.com/latin/bs/about/engstory.html#early>). With such a huge volume to handle, it became necessary for the company to use information technology to keep track of its shipments. UPS introduced *UPSnet*, a global electronic data communication network that has more than 500,000 miles of communications lines and includes a UPS satellite. It links more than 1,300 UPS distribution sites in 46 countries and tracks 821,000 packages daily.

The UPS website soon included an option for tracking packages in real time. Online tracking requests on www.ups.com exceeded one million per day for the first time, on Dec. 22, 1998 (March 2001, <http://pressroom>

.ups.com/about/facts). This clearly indicates the importance of tracking information to the customer, whether he/she is waiting for a product or an important document. UPS provides many customer information services, including *TotalTrack*. *TotalTrack*, based on a nationwide cellular mobile data system, can instantly provide customers with tracking information for all bar-coded air and ground packages (March 2001, <http://www.ups.com/latin/bs/about/engstory.html#early>).

Information technology has been a critical enabler for ensuring that package delivery companies can provide services to their customers, such as tracking and tracing a product, from the time it leaves its origin to the time it reaches its destination. Companies acknowledge that information technology plays an important role in this process. FedEx, for example, announced in 1999 that it would spend \$1.6 billion in the following year on technology, much of it for upgrading systems that collect, manage and distribute shipment data. The new trends in tracking and tracing generally involve the use of wireless technology.

METHODOLOGY

The main objective of this article is to analyze the various stages at which companies provide information about the order status process. The number of stages at which companies collect and provide information are noted. Then the type of information they provide is documented. An analysis is provided describing how this information adds value to the order status process.

Some of the parameters used for comparing processes across companies are:

- How soon does a customer get an ID number? Is the ID number assigned at

the time of ordering or is an e-mail notification sent to the customer?

- How are the companies providing order status information? Do the companies have a secure network over the Internet through which they provide order status information? Some companies also send e-mail reminders to the customer to tell them where their order is in the production process.
- How good is customer service? Customer service support can be in the form of a FAQ list, e-mail service (with a promised turnaround time), and 24/7-toll free phone service. Some companies also have a text based chat service with a customer service representative.
- Once an order has left the manufacturing facility and has been delivered to a carrier, how is the tracking information provided? Does the company send an e-mail notification to the customer that the order has left their facility and is now with the carrier? It is important to note whether the company has a direct link to the carrier's web site (from its own web site), through which a customer can track the order, or does the customer have to go the carrier's web site and track the order using the tracking number?

In choosing companies to analyze, two of the selection criteria that were applied were that the company should be in a high technology industry and should provide for online shopping. For this research project, ten companies were chosen. As mentioned in a previous section of this paper, this was a benchmarking study. Thus, the companies were selected on the basis of similarity to the reference company. The companies' products included:

- computers—desktops, laptops, main-frames, and network servers
- microprocessors and chips for communications, industrial equipment, and military markets
- networking services and communication infrastructure
- computer peripherals, routers, storage devices
- a wide range of computer software
- Can the customer obtain order status information online, by phone, or both?
- What are the number of stages in the order status process?
- Does the company provide any text based online chat facility for customer service related questions?
- Is the customer notified whenever the order is received or shipped?
- Does the company have a promised turnaround time for e-mail inquiries?

Most of the companies also offered computer and computer-related consulting services.

Most of the information about the order status process of these ten companies, discussed in the next section, is available on their web sites. Some of this information was obtained by calling customer service representatives at these companies. E-mails were also sent to the companies for obtaining the required information. The formats of the e-mails sent and the questionnaire are given in Appendix I and Appendix II, respectively. All of the information obtained would be readily available to customers of these companies.

COMPARISON OF GLOBAL ORDER STATUS PROCESS OF COMPANIES

Some of the criteria used for comparison are as follows:

- Does the company provide the capability of buying the product online, by phone or both?

- Is the customer service toll free number accessible 24 hours a day, 7 days a week?
- Can the customer track the product online through the company's web site, through the carrier's web site, or both?
- How soon does a customer get an order number?
- Is the company offering customized products, i.e., is the customer allowed to configure the product according to his/her needs?

Table 1 gives information regarding whether the various companies give the option of ordering a product online or ordering by phone and whether they provide the facility of checking the order status online or by phone.

TABLE 1
ORDERING AND ORDER STATUS

Company Name	Order by Phone	Order Online	Order Status Phone	Order Status Online
A	Yes	Yes	Yes	Yes
B	Yes	Yes	Yes	Yes
C	Yes	Yes	Yes	Yes
D	Yes	Yes	Yes	Yes
E	Yes	Yes	Yes	Yes
F	Yes	Yes	Yes	Yes
G	Yes	Yes	Yes	Yes
H	Yes	Yes	Yes	Yes
I	Yes	Yes	Yes	No
J	Yes	Yes	Yes	Yes

Only Company I still does not provide order status information online and the customer has to contact the company by telephone or a feedback section provided on the online shopping menu.

Table 2 gives the number of stages in the online order status menu of each company. One thing to be noted is that five companies give order status information at just two stages, order received and order delivered. Also, Company I has not started giving online order status information. Company C and Company H have excellent customer service and one of the most detailed order status menus.

Table 3 compares the 10 companies on three different parameters:

- Text based chat (customer service)—Is it available or not?

- E-mail updates when order shipped—Do the companies send e-mail updates when the order ships?
- 24/7 toll free access—Is customer service available around the clock to help customers in online ordering and related inquiries?

Only Company G and Company H provide for online text based chat service. Most of the companies do have the infrastructure for providing online text-based chat service. This is evident from the fact that almost all of these companies provide technical support through that medium. Either the idea of providing customer service through text-based chat service did not occur to these companies or the companies think that it does not add real value. After chatting with the customer service people from Company G and Company H, the authors feel that it is an

TABLE 2
NUMBER OF STAGES IN THE ORDER STATUS PROCESS

Company Name	Number of Stages*
<i>A</i>	6
<i>B</i>	2
<i>C</i>	8
<i>D</i>	4
<i>E</i>	2
<i>F</i>	2
<i>G</i>	2
<i>H</i>	7
<i>I</i>	0
<i>J</i>	2

*While ordering online

TABLE 3
ONLINE ORDER SERVICES I

Company Name	Text Based Chat (Customer Service)	E-mail Updates When Order Shipped	24/7 Toll Free Access
A	<i>No</i>	<i>Yes</i>	<i>Yes*</i>
B	<i>No</i>	<i>Yes</i>	<i>No</i>
C	<i>No</i>	<i>Yes</i>	<i>Yes*</i>
D	<i>No</i>	<i>No</i>	<i>Yes</i>
E	<i>No</i>	<i>No</i>	<i>No</i>
F	<i>No</i>	<i>Yes</i>	<i>Yes*</i>
G	<i>Yes</i>	<i>Yes</i>	<i>Yes*</i>
H	<i>Yes</i>	<i>No</i>	<i>Yes</i>
I	<i>No</i>	<i>No</i>	<i>Yes*</i>
J	<i>No</i>	<i>No</i>	<i>No</i>

*Store Assistance Only

excellent medium of communication. Another advantage includes less waiting time than on a typical toll free call. Also, it becomes easier to dictate the order number online (rather than remembering names from all alphabets;

A for Alice, B for Brian, etc.). One disadvantage could be that customers are more accustomed and comfortable with actually talking to people about their problems rather than writing about them.

The customer can effectively use a combination of both telephone and chat service to have queries answered.

In this study, five companies provided e-mail updates when the order was shipped. Some companies provide off-the-shelf products and the customer can know when to expect the delivery of the product by analyzing the various delivery options provided on the checkout menu. In this case, an e-mail notification may not be of much significance. In cases where the product is built to specifications provided by the customer, e-mail updates should be provided to the customer. Company H, although known for its other customer service initiatives (like text based chat service, 24/7 toll-free assistance), does not have such capability. For corporate orders, e-mail updates become even more significant because of the need to efficiently manage inbound logistics.

Most of the companies in the study provide round-the-clock, toll-free customer service access for ordering products. Some companies provide 24/7 customer service support for inquiries beyond ordering a product. They will tell a customer to call back during normal office hours for any reason other than ordering.

As online ordering increases in volume, 24/7-customer service support will become necessary for most order-related inquiries. This capability supports one of the main objectives or purposes of online shopping: the convenience of ordering at any time.

Table 4 compares the companies further on three other parameters:

- Track (only carrier/both)—Can the customer track the product from the source company's (manufacturer) web site or is it necessary to go to the carrier's web site to track it? Some companies also give

the option of tracking the product in both ways.

- Order number assigned—When is the order number assigned to the customer, instantly or via an e-mail?
- Customized products—Does the company offer customizable products?

Most of the companies provide the capability of tracking the product both ways. Customers like going to just one place to either find the status of their orders or to track their products and being able to use just one number throughout. This means that the company should have a direct link to the carrier's web site. Although it does not require much information technology investment to provide this value added service, some companies still lack this ability (as is evident from Table 4). Interestingly, there is one company that does not give out tracking numbers at all for security reasons. It is necessary to contact its customer service representative via telephone to track products.

There are two options available for giving order numbers to customers. One method is to give the order number instantly on the screen, and the other is to send it via e-mail. Using both methods, i.e., giving a number instantly on the screen and following it up with an e-mail confirmation, would be an even better approach. There are some technological implications in assigning the number instantly. Also, some companies want to confirm the availability of all production materials before assigning an order number because the order number, in many cases, has a direct link to when the order is scheduled for manufacturing. Companies that sell only off-the-shelf products can find it easier to assign an order number instantly since they only have to check the availability of one final product instead of checking an entire list of raw materials.

TABLE 4
ONLINE ORDER SERVICES II

Company Name	Track (Only Carrier/Both)	Order Number Assigned	Customized Products
A	<i>Both</i>	<i>E-mail</i>	<i>Yes</i>
B	<i>Both</i>	<i>Instantly</i>	<i>No</i>
C	<i>Both</i>	<i>E-mail</i>	<i>Yes</i>
D	<i>Carrier</i>	<i>Instantly</i>	<i>Not Known</i>
E	<i>Both</i>	<i>Instantly</i>	<i>Yes</i>
F	<i>Carrier</i>	<i>Instantly</i>	<i>No</i>
G	<i>Both</i>	<i>Instantly</i>	<i>Yes</i>
H	<i>Both</i>	<i>Instantly</i>	<i>Yes</i>
I	<i>Carrier</i>	<i>E-mail</i>	<i>Yes*</i>
J	<i>No number given**</i>	<i>E-mail</i>	<i>Yes*</i>

*Very rarely **Security issue

Most of the companies in the study provide the capability of customizing a product. Customers can configure their product online and can have it made to specifications. Many of the customer related issues change to some extent when it is a made-to-order product. The customer needs more help regarding the order when it is made-to-order. The most important thing that he/she may need is 24/7 toll-free access or 24/7 online text-based chat service. All of these customer service issues are closely related to each other, and the company that provides the best mixture will create much goodwill.

CONCLUSIONS OF THE RESEARCH

It appears that most of the companies in the study have started to take their order status process seriously. Although only some provide a comprehensive set of information through their web sites, detailed information can be obtained from all by calling com-

panies' toll free numbers. As previously mentioned, some of the companies provide off-the-shelf products and therefore detailed order status information may not add real value for the customer. One important criterion that may distinguish one company's service from another is how soon it provides the customer with a tracking number and what options there are for tracking products.

The situation changes when the product is built-to-order. In this case, the time from ordering to final product delivery is quite variable. A customer in this case will appreciate getting as much information as possible regarding the product. Therefore, it becomes more important for the company to keep the customer updated concerning the status of the order. Providing detailed order status information online may also reduce the number of customer service calls from customers wanting to know the status of their orders.

Based upon this sample, there is certainly room for improvement in the area of providing order status information to the customer. Most of the companies provide information at two stages only, namely order received and order shipped. While this sort of information may be enough for some customers, others may demand more visibility. One difference between companies is in the way they provide information. Depending upon how a company provides information, some customers may rely more upon the online order status menu and some are more likely to call customer service. Another difference between companies in the sample is that, when an order is shipped, only some companies provide e-mail updates. One similarity is that the customer has the option of buying the product online or by telephone from all of the companies. Another similarity is that all of the companies have customer service representatives for assisting customers during their online shopping experiences.

Although not directly stated, the high technology companies can provide added services such as accepting online signatures and online checks or other modes of payment, all of which will make online ordering easier.

Companies like FedEx and UPS are constantly upgrading and adding new services every day to enhance order traceability and to give their customers improved service. The possibility of linking up with these service providers to see what improvements can be made in the order status side of the business offers great potential for all of these high technology companies.

THE FUTURE OF ORDER STATUS TRACKING

While the order status processes discussed in this article offer significant improvements

from just a few years ago, the technology exists to provide supply chain managers with what they really want—real-time supply chain visibility. Applications are already being implemented, though sometimes limited by high cost and still existing technical problems. Event management software allows managers to monitor for exceptions, such as late shipments or inventory shortages (Trebilcock 2002). The software can even notify a decision maker when those exceptions occur, simulate solutions, and even take action to correct the problem and measure the outcome.

In addition to being able to obtain information on order status, supply chain managers also want to be able to track inventory moving between stations within a plant or between facilities. Radio frequency identification (RFID) and scanning technology are examples of technologies used in real-time locator systems. RFID technology allows users visibility of products, containers, transportation, and even people. The following are some examples of RFID applications.

Gillette is attaching RFID tags to selected items that are shipped to two Wal-Mart stores equipped with “smart shelves” capable of reading signals from the chips and tracking the merchandise’s location. When the supplies on the store shelves run low, stock clerks are alerted to refill them; when stockroom shelves run low, the system orders more (Ewalt 2003).

The Ford Motor Company in Cuautitlan, Mexico, secures RFID tags to a vehicle skid, and then custom programs it with a serial number that is referenced through Ford’s operating system. The serial number can indicate what has been done

to each vehicle, as well as what still needs to be completed further along the production line (Johnson 2002).

UK retailer, Marks & Spencer, is replacing bar codes with RFID tags to track the refrigerated foods used in its supply chain from production to purchase (Roberts 2002).

CHEP, the international pallet and container pooling company, is starting a pilot program and installing RFID tags on its pallets to enable real-time tracking of assets (Hyland 2002).

In situations where RFID does not work well, other wireless technologies or use of the Internet can offer solutions. Differential Global Positioning Systems (GPS) are used in marine terminals to track containers (Werb and Sereiko 2002). Error rates are estimated at 15% in marine terminals. Eliminating these errors represents improved tracking accuracy for a very large amount of cargo. GPS-based tracking systems and Internet software tools are used to assist railroads in

tracking, fuel management, and railcar maintenance (Judge 2002). Finally, many supply chain software companies offer web-based systems that span the functional areas of the supply chain (Wilson 2001).

These newer technologies offer a much greater degree of sophistication than the tracking processes examined in this research study. Nevertheless, there is still a place for the simpler systems. Along with the sophistication of the newer technologies come higher costs. Sometimes so much information is available that it is not used effectively. According to supply chain professor, John Langley, "The objective should not be visibility. The objective is having information available so managers can take action when needed. Visibility for its own sake provides no value." (Fitzgerald, 2003) What visibility can offer is the information for managers to monitor transactions and shipments, respond to errors, and focus their attention on their most important customers. This should help them achieve a synchronized and efficient supply chain.

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APPENDIX I E-MAIL SENT TO CUSTOMER SERVICE DEPARTMENTS

We need some information regarding the following.

- Do you give any order status information online/on phone?
- Will I be assigned an order status number?
- What sort of information will I have once I order? For example, will I have information as to when my order is in production, scheduled, etc? Can you please list all the stages at which you provide information.
- Do you have a live representative online (i.e., a text based chat facility) by which I can obtain my order status information?

APPENDIX II QUESTIONS ANSWERED BY CUSTOMER SERVICE REPRESENTATIVES

- Company name and products
- Can I buy all products online (like laptops, etc.)?

- Can I customize the product; do you provide such a facility?
- Will you assign me an order status number instantly?
- Can I have order status information online?
- Can I have order status on the phone?
- Do you have a chat/text-based facility with which I can obtain my order status info?
- At what stage/how many stages do you provide order information?
- Remarks:

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SURFACE FREIGHT TRANSPORTATION IN MEXICO POST NAFTA

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One of the significant expressed objectives of NAFTA was the improvement of cross-border transportation to enable a more efficient and cost effective flow of goods among Mexico, Canada and the United States. This article examines the changes that have taken place in surface freight transportation between Mexico and the U.S. since NAFTA was signed in 1993.

INTRODUCTION

One of the major expressed objectives of the 1993 North American Free Trade Agreement (NAFTA) was to facilitate the cross-border movement of goods and services between the territories of Canada, Mexico and the United States. Another objective was to increase trade among the three countries by removing tariffs, quotas and other trade restrictions. A review of the increases in trade volume since 1993 provides ample evidence that the later objective has been achieved. For example, the number of commercial trucks carrying U.S. exports to Mexico increased over 407% from 1990 to 2000 while the number of trucks transporting Mexican exports to the U.S. increased 328% over the same period. There were a reported 2.26 million commercial truck crossings into Mexico from Texas in 2000 and another 2.38 million truck crossings from Mexico into Texas (TAMIU, 2002). In the same report, the Texas Center for Border Economic and Enterprise Development, reported the number of freight railcars transporting goods into Mexico more than doubled from 1993 to 2000 from 147,216 to 298,919 (TAMIU, 2002). However, in the ten years since NAFTA's passage there has

been little improvement in the cross-border movement of goods between Mexico and the United States.

Commercial truck movements into each country's interior remain a time-consuming, inconvenient process, largely unchanged since 1990. Neither country yet allows foreign trucking beyond a twenty-mile commercial zone. As a result, the promised benefits of improved transportation, such as faster transit times, reduced pipeline inventories and better reliability of shipment delivery, have not yet been realized. While cross border movement of goods remains as cumbersome, inefficient and unpredictable as it was prior to NAFTA, there have been several significant improvements in Mexico's transportation infrastructure since NAFTA's passage. The purpose of this article is two fold: to examine the progress Mexico has made in modernizing its rail and highway transportation modes and to outline the reasons why there has not been much improvement in the cross-border flow of goods between the U.S. and Mexico. This article also reviews major economic policy changes in Mexico and makes recommendations on how Mexico and the United

States might achieve a better flow of goods across their shared border.

RAIL IMPROVEMENTS IN MEXICO

Privatization

Ferrocarriles Nacionales de Mexico (FNM), Mexico's national railroad, was established in 1873. It was owned and operated by the central government of Mexico from 1937-1994. Over the course of this 57-year period, Mexico's rail system suffered from neglect and severe lack of capital funding (Barrera, 1999). As a result, Mexico's national railroad became slow, unreliable and highly inefficient. The lack of required track replacement and track maintenance caused frequent derailments. By 1980, 75 per cent of Mexico's existing track dated back to pre-revolution days before 1910 (Barrera, 1999). Train robberies by organized gangs of armed bandits were also commonplace during this period. Approximately one in every five trains was boarded and robbed as recently as the late 1980's (Kaufman, 2001).

Beginning in 1994, the Mexican government began to address the need for significant improvement in its freight rail system by deciding to privatize the entire 16,500-mile network. In the same year, the first of FNM's three major railway regions was sold to the Transportation Ferroviaria Mexicana (TFM) consortium for \$1.4 billion. TFM's winning bid gave TFM partners the right to operate the 2,661-mile Northeast system for 50 years with an option for an additional 50 years (Vantuono, 1999). TFM's line is the most important of the major FNM (Ferrocarril del Noreste) rail regions because it provides the primary rail route in Northern Mexico and links the industrial areas of Mexico City and Monterey with the United States at Laredo, Texas. Approximately 60% of all the trade between Mexico and the United States crosses the border at Laredo/Nuevo Laredo (TAMIU, 2002). Although the Northeast system controls less than 19% of the total Mexican trackage it moves 40% of Mexico's domestic freight (Vantuono, 1999). For the past

four years the three TFM partners have been the U.S.-based Kansas City Southern Industries Corporation (37%), its Mexican affiliate, TMM/Grupo Service (38.5%) and the Mexican government (24.5%). By law, Mexico's four privatized rail systems must be at least 51% owned by Mexican-based investors, which has required U.S. investors to find Mexican partners. The privatization of all four parts of the FNM was completed last year under this ownership rule.

The second rail freight system to become privatized was the Ferrocarril line, a 4,052-mile Pacific-North line and the 938 mile Ojenaga-Topolobampo railroad. The new owner is Grupo Ferroviario Mexicano Mexican Railways, a newly formed alliance of two large Mexican companies and the U.S.-based Union Pacific Corporation. The Ferrocarril line connects Calexico, California and El Paso, Eagle Pass and Brownsville, Texas (House, 1999).

A third section, the 1,000-mile Southeast section, is now owned by a group of Mexican investors. The Southeast Railroad connects Mexico City with several important ports along the Gulf coast including Veracruz and Coatzacoalcos. This line has the lowest revenues currently but the highest growth potential because it links several of Mexico's busiest seaports. Railcars are currently being ferried between Coatzacoalcos and Mobile, Alabama by GulfLink Marine. There is also reported interest in the Southeast line by the Canadian National (CN) Railroad. With its recent acquisition of the Illinois Central Railroad, CN currently provides cross-border service between Canada and the U.S. and has routes to the Mexican border (Kaufman, 2001).

Improvements Since 1994

With privatization has come a much needed infusion of capital to replace obsolete rolling stock, buy new locomotives, repair and upgrade track and install computerized control systems. Most of the improvements have been to the Northeast section owned by TFM and underwritten with capital provided by Kansas

City Southern Industries. TFM spent \$90 million for infrastructure improvements within a year of winning the operating bid and another \$600 million by the end of 2001 (KCSI, 2002). The money has gone to purchase over 2,800 new pieces of rolling stock, and 150 new locomotives. TFM has also negotiated a new labor agreement, rebuilt the main line between Mexico City and Laredo, built a new service center and a new computerized railroad operation center (KCSI, 2002). The investment appears to be paying off, at least as of year ending in December 1999 versus the previous year. The 1999 revenue from railroad operations was \$524.5 million, an increase of 22 percent over 1998 while the operation ratio improved from 85.5% to 76.6% (KCSI, 2002).

Mexican Railways has also invested heavily in infrastructure movements to improve their 4,052-mile rail network. By the end of 1999, they had spent nearly \$400 million to rebuild track, build new sidings and modernize their fleet of railcars (Kaufman, 2001). Both new major system owners have also beefed up security. Mexican railways has hired 1600 security officers, put up new fences and lighting and covered all railcar hatch covers with fiberglass. TFM has hired over 1000 security personnel, reducing the number of train robberies (House, 1999). As a result, train theft no longer appears to be a major problem as it was before rail privatization.

The benefits of privatization are beginning to be realized by shippers. Vantuono (1999) reports that Mexican Railways shipped 30 percent more grain and other agricultural commodities in 1999 than it did in 1998. The Northeast rail line experienced similar growth from 1998 to 1999 and reduced its average transit time from Laredo to Mexico City from 60 hours to 36 hours. As a result of capital improvements and better track maintenance, the newly privatized Northeast rail line can offer shippers transit times equal to motor carriage at lower rates. Rail privatization has also helped cross-border transportation.

Products moving by train from the U.S. to Mexico's interior can now be moved on a single through bill of lading. Formerly, rail shipments from the U.S. into Mexico had to be rebilled at the border, which was often a very time-consuming process. Railcars must still be switched to Mexican locomotives at the border but since the operations are now frequently under the control of the same company, the switching is much more efficient than it was before rail privatization (House, 1999).

Remaining Problems in Cross Border Rail Freight

Incompatibilities in the customs clearance procedures between the United States and Mexico remain, even though the new railroads have built customs processing yards to facilitate clearance. Both the TFM Railroad and Mexican Railways have built processing yards several miles from the main border crossing at Nuevo Laredo, but the railroads are only capable of improving processes under their control. The governments of the United States and Mexico have done little to reduce the paperwork and bureaucracy inherent in the customs clearing process (Ross, 2001). One improvement would be to make the shipper of record the company with whom customs officials deal, not the railroad or the freight-forwarder. There is often not enough shipper involvement in the clearance process to clearly identify who the shipper is and what is being shipped. This issue has become a matter of national security since 9/11.

Another problem facing the Mexican railroad industry is a shortage of intermodal facilities throughout the country. According to McCosh (2001), intermodal service has improved since rail privatization, but is still slow and inefficient. Mexican Railways and the Northeast Railroad are planning new intermodal facilities in Mexico City and Guadalajara, among other places. The Pantaco terminal in Mexico City is incapable of handling much more traffic, but the new facility is expected to triple the current lift capacity in

Mexico City. Intermodal movements using rail for long hauls are expected to grow over the next few years.

MEXICAN TRUCKING

The Mexican trucking industry currently accounts for approximately ninety percent of all goods transported within Mexico (Ross, 2001). Cross-border trucking by Mexican carriers, however, continues to be restricted to a twenty-mile commercial zone along the American-Mexican border. This restriction contradicts the North American Free Trade Agreement which stipulated that Mexican trucks would be allowed free access throughout the border states of California, Arizona, New Mexico and Texas by 1995. The North American Free Trade treaty also stipulated that by January 1, 1999, trucks from either country would be allowed cross-border access to any point in the other country. By 2000, foreign investment in trucking companies would be allowed up to fifty-one percent of the company and by 2003, 100-percent ownership would be allowed. To date, neither country is in compliance with these provisions. The United States government has not given Mexican trucks access to the United States because of safety and labor concerns. Opposition in the U.S. has been led by organized labor and highway safety lobby groups. The Mexican government has reciprocated by not allowing American trucks access to Mexico.

U.S. Opposition to Open Borders

The International Brotherhood of Teamsters, U.S. consumer groups, and U.S. insurance underwriters have combined to create a powerful political coalition that opposes opening the border to Mexican trucks. The teamsters opposed the idea of NAFTA from its inception based on the belief that American union members would lose their jobs to less expensive Mexican truckers. James Hoffa, the president of the Teamsters Union, has been a strong and outspoken opponent of opening the border to Mexican trucks predicting that it would cost several thousand union jobs (Hall, 1999).

Consumer groups, including Citizens for Reliable and Safe Highways (CRASH), have cited Department of Transportation (DOT) statistics that show commercial trucks account for a significant and disproportionate number of highway accidents and fatalities in the United States. For example, in 1997 the DOT reported 444,000 large-truck (greater than 10,000 pounds) accidents in the United States, resulting in 5,355 deaths and 133,000 injuries (Leming, 1998). Twenty percent of the reported injuries were catastrophic, meaning loss of limbs, brain damage, or paralysis requiring long-term medical care.

The lack of an adequate number of U.S. truck safety inspectors at the border has also been well documented. For example, only four full-time truck safety inspectors are assigned at the main border crossing at Laredo, Texas which processes an average of 3,850 Northbound trucks a day (TAMIU, 2002). The insurance industry is also concerned about the lack of hours-of-service limits in Mexico and the incompatibility of weight restrictions. In Mexico, trucks are allowed to weigh up to 130,000 pounds, compared to the United States where the limit is only 80,000.

The Teamsters union claims that Mexican trucks are unsafe and that Mexican trucking will eliminate American jobs are questionable. The Government Accounting Office (GAO) published a safety study in 1996 which reported that 45% of inspected Mexican trucks did not pass safety tests while 28% of American trucks failed the same tests. In 2000, the GAO reported that the number of Mexican trucks that failed safety inspections had fallen to 36%, compared to 24% of American trucks (GAO, 2000). The 2000 report suggested that the percentage of Mexican trucks failing the safety inspections might be linked to the twenty-mile limit placed on Mexican trucks entering the United States. According to a study by Ross (2000) Mexican firms do not use their best trucks for short trips across the American border into the commercial zone. Rather, the best Mexican trucks are reserved for long haul trips, which prevents

them from being used in cross-border trade. This would tend to indicate that the overall safety record for all Mexican trucks might be better than that reported by the U.S. Department of Transportation. This discrepancy is supported by a U.S. DOT study which reported that, of 500 Mexican trucks caught making illegal long haul trips into the United States in 1999, fewer than 30% failed rigorous safety tests (Mongelluzzo, 2000).

The Teamsters Union's claim that American jobs will be threatened is also questionable. Mexico has about 375,000 registered commercial trucks and 15 large motor freight carriers as compared to approximately 7,000,000 commercial trucks and over 400 large carriers in the United States (Mongelluzzo, 2001). While it is possible that Mexican trucks could secure some truckloads of merchandise in Mexico for delivery into the United States, Mexican carriers would need a sales and marketing presence in the United States to secure backhaul loads. Without backhauls, Mexican trucks would be driving many empty, unprofitable miles. It is highly unlikely that only a small number of Mexican motor carriers with modern vehicles and well-trained drivers would be able to successfully compete with American trucking industry inside the United States.

Progress Toward Open Borders

Since 1987, the United States government has invested approximately \$370 million for capital improvements to help facilitate cross border truck movements. The vast majority of this federal money has gone to the border states of California, Arizona, New Mexico and Texas to build new ports of entry and improve/expand existing ports of entry. New truck inspection facilities have been built with this money and highways near the border have been widened (GAO, 2000). In addition new customs procedures have been developed and implemented.

The U. S. Customs Service is now using a system called the Automated Targeting System at five

border locations. The purpose of this new computer-based technology is to expedite the flow of Mexican imports by identifying "problem" shipments before they arrive at the port of entry. Non-problem shipments are then processed faster by U.S. Customs. This new system is linked to another U.S. Customs innovation called the Border Release Advance Screening and Selectivity Program. This program is designed to speed up imports made by companies who regularly import through a given port of entry more than fifty times a year using the same truck and the same driver. The GAO (2002) estimates this program applies to ten percent of the truck traffic entering the U.S. from Mexico. While these improvements have provided better border inspection facilities and in some cases, better customs procedures, inadequate border staffing by federal agencies including the U.S. Customs Service, DEA, USDA, and the Immigration Service continues to be a limiting factor for cross-border transportation. The lack of adequate manpower at the U.S.-Mexican border has been exacerbated by the requirement to shore up law enforcement and security forces along the U.S.-Canadian border following the 9/11 terrorist attacks. While homeland security has become the most important border issue facing the Bush Administration, President Bush appears committed to complying in full with the NAFTA trucking provisions.

The Bush Administration appears to be much more inclined to push for an opening of the U.S. to Mexican trucking. President Bush has made it very clear that he supports the implementation of the NAFTA provisions despite opposing views from the Democratic Party in Congress. In August of 2001, the Senate voted to impose stringent safety requirements on Mexican trucks that travel on American highways (Samuel, 2001). These requirements include mandatory inspections at the United States border and insurance provided by an U.S. licensed insurer. The Bush administration has pointed out that Canadian trucks are not forced to meet these standards, which has led to claims of discrimination from the Republican Party. Former Republican Senate Minority leader,

Trent Lott, has called this bill "anti-Hispanic." President Bush has promised to veto the pending transportation bill if these standards are required of Mexican trucks. However, this issue has become moot in view of recent developments.

On November 27, 2002, the U.S. Department of Transportation (DOT) announced that the Bush administration would begin allowing Mexican-domiciled trucking companies to apply to the DOT for operating authority from Mexico into the United States (Gamboa, 2002). In so doing, President Bush modified the 1982 congressional moratorium on Mexican trucking in the U.S. and fulfilled U.S. obligations under NAFTA. However, before any Mexican trucking company can begin cross-border freight service, its service proposal must be approved by the DOT's new Federal Motor Carrier Safety Administration (FMCSA).

Secretary Mineta has said the FMCSA now has adequate border inspection facilities and trained personnel in place to insure Mexican trucks and drivers entering the United States comply with the same safety standards U.S.-domiciled trucking companies are held to (Longo, 2002). These standards include drug and alcohol testing, a limit on operating hours without rest and logbooks. In addition, Mexican drivers who operate in the U.S. must possess a *Licencia Federal*, the equivalent of the U.S.'s Commercial Driver's License (CDL). Mexican trucking companies granted operating authority under this new process will be allowed to deliver goods originating in Mexico to any destination in the United States and will be allowed to back-haul freight to Mexico. Under the terms of NAFTA, Mexico is obligated to extend the same opportunities to U.S.-domiciled trucking companies.

MANAGERIAL IMPLICATIONS

The improvements that have occurred in Mexico's rail freight system and the recent decision of President Bush to open the U.S. to Mexican motor freight transport have implications for many sectors of both the U.S.

and Mexican economies. As of November 27, 2002, 130 Mexican-domiciled motor carriers had applied to operate beyond the border commercial zones in the United States (Longo, 2002). The DOT estimates that about 60 of these motor carriers have met the basic requirements and are ready for a FMCSA safety audit (Longo).

Based on these numbers it would appear the initial impact of Mexican trucking on shippers and competing U.S. motor carriers will be minimal. Most Mexican motor carriers are small and lack the capacity of the average U.S. international trucking company. Since most U.S. truckload carriers are larger and more experienced in competitive markets, they will likely benefit more than their smaller, less experienced Mexican counterparts. Truckload shippers in the United States will have more service choices in moving their freight to Mexico which may result in lower rates. It is unclear at this point what rates Mexican motor carriers will offer on backhauls but with lower operating costs, it is safe to assume selected rates will be lower than current rates being offered by U.S. motor carriers. U.S. motor carriers like Schnieder and Contract Freighters, Inc. (CFI) who have significant trucking operations to and from the Mexican border will be most affected. While most of the attention over NAFTA and cross-border transportation has focused on motor freight, the recent improvements in Mexico's rail industry have much broader implications for the long term.

Rail freight transportation offers the lowest cost alternative for many Mexican and international companies who ship large quantities of finished goods from Mexican assembly plants (*Maquiladoras*) to U.S. and Canadian destinations on a regular basis. Large volume shipments of heavy manufactured goods like automobiles and durable household goods are best suited for rail transport. In the past, the Mexican National Railroad was not an effective mode for either domestic shipments or cross-border shipments. Over the last ten years privatization of Mexico's railroads has brought about many service improvements. In addition,

several large U.S. and Canadian railroad companies are now major partners with Mexican rail interests. As intermodal improvements are implemented, the number of carloadings and containers moving by rail between the U.S. and Mexico will continue to increase at a rapid pace. In fact, under a new U.S. initiative stimulated by NAFTA called the "Borders and Corridors" program, the U.S. has authorized over \$140 million a year in grants to facilitate efficient cross-border rail freight movement (Hamberger, 2001). With federal encouragement, it is likely modern freight trains will travel from Mexican cities to U.S. cities as easily as international rail service between the U.S. and Canada. This, of course, will benefit North American shippers and lower the cost of imported goods for many North American consumers. It is likely international rail service will provide stiff competition for motor carriers on selected high-density routes over 500 miles much like the case now in the United States.

CONCLUSION

The railroad industry in Mexico has made great progress over the past eight years. Beginning in 1994, operating rights for the state-owned National Railway were auctioned to private companies. The dilapidated state railroad was divided into three main sections: the Northeast Railroad, Mexican Railways, and the Southeast Railroad. The remainder of the railroad was divided into five small sections, the rights to which were also auctioned to the public. Private companies have invested hundreds of millions of dollars on rolling stock, infrastructure, security,

and locomotives. Efficiency has been improved by reducing the labor force, eliminating cabooses, building needed customs clearing yards close to the border, and by streamlining operations. Mexico has improved its railroads to the extent that they are now competitive with the nation's trucking industry, which until recently carried ninety percent of the country's freight.

Although the railroads have made dramatic improvements, trucking remains the most dominant mode of freight transportation in Mexico. The trucking industry in Mexico has improved to the point where the Bush Administration has agreed to allow Mexican-domiciled motor carriers to apply for operating authority into the United States on a regular scheduled basis. The Department of Transportation, beginning in the Clinton Administration, refused to allow Mexican trucks to penetrate beyond fifty miles into the country despite the provisions of the North American Free Trade Agreement, which specifically stated that Mexican trucks could deliver to any point in the United States beginning in 1996. The U.S. Department of Transportation has said it is now ready to process the applications and perform the safety audits necessary to insure safety requirements are met. Many economists believe that the operation of Mexican trucks in the United States will pose no threat to American jobs. It is more likely that U.S. domiciled motor carriers will be able to expand their international routes and manpower and take advantage of reciprocal operating rights to and from internal Mexican markets.

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SHIPPERS USAGE OF THE INTERNET INCLUDING E-MARKETPLACES IN THE TRUCKING INDUSTRY

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ABSTRACT

The research reported in this manuscript provides insights regarding trucking related e-marketplaces and web-based offerings by truckers. Over 2,000 shippers were surveyed with 420 total responses. Overall, only 7% of shippers were currently utilizing e-marketplaces; however, those that are appear to be satisfied. Shippers ranked tracking, freight posting, and pricing, in that order of importance for trucking web sites.

INTRODUCTION

In today's competitive business environment, shippers increasingly view the transportation of goods as an integral component of supply chain management, rather than simply a cost of doing business. This new approach requires that every effort be made to increase visibility of the transportation of products in addition to managing this cost center.

The growth of the Internet has coincided with this new orientation. Electronic marketplaces, defined by Forrester Research as, "new models of electronic commerce, including auctions, aggregators, bid systems and exchanges," have made considerable inroads into the transportation industry as a means of improving efficiency by matching demand of the shippers with supply of transporters. In the trucking industry, load

matching follows shipment tracking as the second most commonly used Internet service function, followed by rate quotation and driver recruitment (Mele, 1998a).

That is not, however, to say that all e-marketplaces have been or will be successful. As Bannan (2001) points out, e-marketplaces often fail to reflect accepted business practices, such as allowing customers shipping prices to reflect their shipping volume levels. In the trucking industry specifically, Hyland (2001) reports that most shippers still conduct business on a contractual basis in the open market, rather than facing the uncertainties involved in dealing with unknown carriers. Indeed, data security, information privacy, government regulation and e-marketplace longevity are reported to be among the greatest concerns associated with the use of e-marketplaces in general (Gilbert 2001).

Shippers may also be deterred by the expensive proposition of hooking into e-marketplaces, which sometimes necessitates heavy systems integration and/or subscription fees (Hammer 2000). Part of the back-end system integration problem involves the use of XML, which provides a format for defining data elements in various documents, thereby simplifying document exchange. However, compatibility problems due to growth in the number of XML variations and the electronic data interchange (EDI) systems sometimes confuse shippers (Gladwin 2001).

Despite these drawbacks, this new form of linking shippers with transportation companies has caught the attention of many in the trucking industry. Galea and Brewer (2000) report that business-to-business electronic commerce is forecasted to increase to approximately \$2.7 trillion by 2004 and that electronic marketplaces will account for

between 45 and 74 percent of electronic commerce in the supply chain. According to Hyland (2001), there are reportedly more than 100 Internet-based logistics companies, including auctions, exchanges, and application service providers, many of which are regionally focused and specializing in a particular transportation mode (e.g., truck, air, ocean, etc.). Furthermore, Sami (2000) reported that there are approximately 55 trucking service-related web sites and that these load-matching sites will be helpful, particularly for small transportation companies, in terms of matching shippers with carriers and thereby reducing costs as fewer trucks will be running empty. Arndt (2001) also believes that the cost cutting potential of Internet usage is significant and that freight companies, through the use of e-marketplaces, are in a better position to manage flows and reduce cost by eliminating unneeded inventories.

Given the growing acceptance of e-marketplaces as a load-matching technique for increasing efficiency, more quantitative research needs to be conducted in this area. Therefore, this study is designed to contribute to this growing body of knowledge by exploring shippers' present and projected future e-marketplace usage patterns as well as their attitudes toward and satisfaction with various aspects of e-marketplaces in the transportation industry.

LITERATURE REVIEW

Internet usage in the supply chain has received little research attention (Dressner, Yao and Palmer 2001). Some studies have looked at Internet technology adoption in the supply chain, although not specifically in the motor carrier/shipper context. For example, Murphy and Daley (2000) surveyed international freight forwarders (IFF's) about their Internet usage patterns. A major

finding of their work was that the IFF's viewed the Internet as complimenting EDI, rather than replacing it. Dressner, Yao and Palmer (2001) surveyed food industry supply chain members regarding their Internet usage patterns and found that EDI accounted for a greater percentage of supply chain transactions than did the web. They also found that the activities performed most often over the web include obtaining product and pricing information from suppliers and providing pricing and product information to customers. Min and Galle (1999) surveyed purchasing managers and found that larger firms were more likely to require suppliers to use e-commerce than were smaller firms.

Other researchers have examined carrier/shipper Internet usage specifically. Kent, Parker and Luke (2001) found that shippers in their study rated e-business attributes (e.g., Internet tracking, e-mail, EDI capabilities) as moderately important carrier selection criteria and suggested that these ratings would have been higher had the data been collected more recently than 1999. In another Internet usage study involving the motor carrier industry, Clarke (2000) surveyed the 75 largest trucking companies in the U.S., and found that these carriers were shifting away from EDI to web-based information technologies. Clarke cited demand by customers for high quality, timely information, as well as flexible information systems as reasons for this shift as well as a lack of EDI standardization.

Clarke's (2000) findings are significant considering that EDI had made steady inroads into the trucking industry from the mid-1970's through the early 1990's. In a longitudinal study, Crum and Allen (1997) found that the percentage of motor carriers using EDI increased from 29 to 37 percent between 1990 and 1996. Crum, Johnson and Allen (1998) found that motor carriers

primarily use EDI for invoicing and providing tracing and shipment information. Load matching was reported by Mele (1998a) to be the second most commonly used Internet function in the motor carrier industry. The authors of this paper found no academic studies specifically addressing the topic of e-marketplaces in the trucking industry. The present study is designed to help fill this void.

Generally, markets are defined as people or organizations having a need for specific products, services, or information and have the ability, authority, and willingness to pay for these things through some type of an exchange process. Further, it has traditionally been assumed that in most cases a "market place" consists of a physical brick and mortar facility where buyers and sellers meet to formalize the exchange process. However, Senn (1996) indicates that in an electronic marketplace the meeting place is a network-based location rather than a physical location and that buyers and sellers are unlikely to know each other and are unlikely to have predetermined agreements. Given this rather nebulous meeting place and the apparent lack of cultivated relationships that have been so widely reported in the past, companies may need to closely examine the benefits of this new type of load matching system before abandoning time-tested methods of doing business. The basic questions would seem to be: what exactly is an e-marketplace and what is to be gained by embracing this type of system?

The origins of the electronic marketplace seem to be rooted in the use of inter-organizational information systems. As interorganizational information systems have continued to evolve, the e-marketplace is becoming more prominent as a method of bringing shippers and transportation companies together while offering the

convenience of cross-company electronic connections.

One of the most appealing features of the e-marketplace is the cost reduction that may be realized through the elimination of numerous business activities. For example, Bakos (1991) suggests that these interorganizational information systems have branched off into electronic marketplaces, which act as an intermediary between buyers and sellers in a vertical market thereby creating five potential characteristics that must be considered in terms of making markets more efficient. Bakos describes these characteristics as being 1) that these electronic marketplaces tend to reduce the costs of obtaining information about prices and product offerings of suppliers, 2) benefits increase as more organizations join the system, 3) these marketplaces impose significant switching cost thereby reducing the likelihood of members being enticed to join rival systems, 4) electronic marketplaces offer substantial economies of scale, and 5) potential members face considerable uncertainty of the benefits gained from joining this type of system. Perhaps this last characteristic might be the reason that Hammer (2000) argues that suppliers are often unwilling to pay a fee to join systems that have either an intent or a consequence of reducing prices to their lowest possible levels, thereby placing many firms in financial jeopardy.

Choudhury (1998) seems to agree that electronic marketplaces are interorganizational information systems and that they enable numerous buyers and sellers to: 1) identify potential trading partners by providing specific product information that can be used to locate sellers, 2) select trading partners by providing information which allows buyers to compare prices, and 3) to execute transactions by facilitating the

exchange of information between buyers and sellers.

The advent of electronic marketplaces may prove even more valuable to the trucking industry as a series of events may have put them in the right place at the right time. The *Economist* (2000) reports that, while top drivers may earn more than \$80,000 annually, most firms have a driver turnover rate five times higher than the average job. They further report that one of the results of this rapidly growing industry has been a shortfall of between 50,000 and 80,000 drivers and that in an effort to retain the present drivers, companies have been forced to reduce the length of trips to between 300-400 miles to allow drivers to spend more time with their families. To accomplish this reduction in miles traveled, many trucking firms were forced to establish regional warehouses allowing loads to be redistributed, thereby reducing travel time for drivers and the hauling of empty or partially empty trailers. These warehouses were then outsourced to manufacturers who were searching for cost saving changes in the traditional channel.

The *Economist* further suggests that with the advent of electronic marketplaces came the demand for warehouses that could fulfill the needs of storage and transportation. Given that many trucking companies had recently built warehouses for the purpose of retaining their drivers, it became obvious that it was mutually beneficial to also use these warehouses to support newly forming electronic marketplaces. The result of this marriage has been that, of the approximately 250 e-commerce fulfillment and logistics firms in the U.S., 25 have come directly from the trucking industry. Further evidence of having the right assets at the right time comes from Valentine and Morgan (2001), who report that, while shippers are

attempting to put in place systems that require fewer transportation providers, they also are seeking asset-based providers rather than "virtual" Internet companies. This desire plays into the hands of those trucking companies who have both the trucks and the warehouses in place to make the electronic marketplace work most effectively. Valentine and Morgan give further support for the probable success of these electronic based systems as they have found that approximately seventy percent of the respondents in their study expect their freight and transportation needs to change due to the rise of electronic commerce. Further, forty-four percent report that a transportation company must have an e-commerce system if they are to bid for their business.

Clearly, electronic marketplaces have made inroads into the transportation industry and are likely to become more important to both shippers and carriers in the coming years. Therefore, the purpose of this study is to contribute to the growing body of knowledge by providing information from shippers on their levels of satisfaction with electronic marketplaces and the likelihood of their use of these electronic marketplaces in the future.

METHODOLOGY

In the spring of 2001, questionnaires were sent priority mail to a list of shippers comprised of *Distribution Magazine* subscribers. A total of 420 were completed and returned out of the 2,132 that were mailed for a response rate of 20%. Among the respondents were many large and well-known shipping firms representing a variety of industries, (e.g., Abbott Labs, C & H Sugar, Merck, Ocean Spray, Pillsbury, S.C. Johnson, Tropicana, Tyson Foods, U.S. Gypsum, U.S. Tobacco, and Wal-Mart).

Three yes/no questions were asked of the respondents and were used as grouping variables in the ANOVA tests. The questions were:

- 1) "My company currently posts truckload freight on Internet e-marketplaces,"
- 2) "I regularly use my primary carrier's current web based offering," and
- 3) "My firm endorses the use of paperless billing by not requiring original paper proof-of-delivery."

Additionally, two questions were designed to gauge respondents' plans concerning future e-marketplace usage. The first asked respondents to rate, on a seven-point scale, their level of agreement with the statement, "My company plans to increase its use of e-marketplaces." Similarly, the next question asked the identical question, only replacing the word "increase" with "decrease." On the same seven-point scale, respondents were also asked to rate their agreement level with the following four statements:

- 1) "My company sees great potential for the usage of e-marketplaces,"
- 2) "My company would likely post freight on my primary carrier's e-marketplace,"
- 3) "Truckload carriers should provide web services similar to what the less-than-truckload (LTL) carriers offer," and
- 4) "My firm understands the implications of XML."

Respondents were also asked to rate the importance of six technology service offerings (e.g., Internet freight posting, Internet pricing, Internet tracking, Internet proof-of-delivery, traditional EDI capabilities,

satellite tracking and communications) on a seven-point scale (not important/very important).

FINDINGS

As shown in Table 1, responding shippers tended to agree more strongly with the statement that they were planning to *increase* their usage of e-marketplaces (mean = 3.72) than they did with the statement indicating plans to *decrease* future usage (mean = 2.86). Of the items in Table 1, the shippers agreed most strongly with the statement that truckload carriers should offer web services similar to those offered by LTL carriers (mean = 5.18), and disagreed most strongly with the statement concerning how likely their firm would be to post freight on their primary carrier's website (mean = 1.93).

They were relatively neutral in their agreement with statements regarding satisfaction with current e-marketplace usage (mean = 3.88) and e-marketplaces having great potential (mean = 4.07).

As shown in Table 2, shippers rated satellite tracing and communication (mean = 4.95) as the most important service attribute, followed by traditional EDI capabilities (mean = 4.41) and Internet tracking (mean = 4.37). In contrast, Internet pricing service (mean = 3.15) and Internet freight posting (mean = 3.26) were rated the two least important Internet services.

Two groups were formed by combining shippers that answered "yes" to being regular users of their primary carrier's web based offering into one group (n = 83), and those

**TABLE 1
MEANS FOR ITEMS**

Item	Mean
Plan to increase e-marketplace usage	3.72
Plan to decrease e-marketplace usage	2.86
Satisfied with current usage of e-marketplace	3.88
See great potential for e-marketplaces	4.07
Would likely post freight on primary carrier's e-marketplace	1.93
Truckload carriers should provide web services similar to LTL	5.18
Shipping firm understands implications of XML	3.45

Note: Means are calculated with a seven-point scale (anchored with strongly disagree/strongly agree) with higher scores indicating higher amounts of attribute.

TABLE 2
MEANS FOR IMPORTANCE ITEMS

Importance Item	Mean
Importance of Internet freight posting service	3.26
Importance of Internet pricing service	3.15
Importance of Internet tracking service	4.37
Importance of Internet proof-of-delivery service	3.94
Importance of traditional EDI capabilities	4.41
Importance of satellite tracing and communications	4.95

Note: Means are calculated with a seven-point scale (anchored with not important/very important) with higher scores indicating higher amounts of attribute.

answering "no" to this question into the other group (n = 323). ANOVA tests were run to determine whether the regularity of usage of primary carriers' web offerings affected future e-marketplace usage plans and attitudes towards e-marketplaces as measured by other items mentioned above, as well as the Internet service attribute importance ratings. As shown in Table 3, significant differences were found on eight items, and on each of these, the regular user respondents gave higher mean ratings.

Another two groups were created by combining shippers that answered "yes" to the question concerning whether their company endorses the use of paperless billing by not requiring an original paper proof-of-delivery into one group (n = 83), and those that answered "no" into the other group (n = 321). Similarly, two groups were also created by placing shippers that answered "yes" to the question about currently being involved in the practice of posting truckload freight on Internet e-marketplaces (n = 28), and those answering "no" to this question into another group (n = 384). ANOVA tests were again run to determine the affect of these variables

on the above-mentioned items. As shown in Table 4, in the case of paperless billing endorsement, significant differences were found on six of these items. As indicated in Table 5, for the freight posting variable, significant differences were found on seven items. As was the case with the regular users of the primary carrier web offerings, it was the participating firms that gave higher ratings (either agreement or importance) to each of these items.

DISCUSSION

The results indicate that shippers tend to agree more strongly with statements that they plan to increase, as opposed to decrease, their e-marketplace usage, which is a positive finding for e-marketplaces. The findings also indicate that shippers expect the same kind of web services from their truckload carriers that they have come to expect from their LTL. Not surprisingly, Internet services related to tracing and tracking of shipments were most valued by respondents. Mele (1998b) reported that shipment tracking was the most popular Internet application in all modes of freight transportation. Shippers benefit from these services by having their

TABLE 3
MEANS FOR ITEMS BY REGULAR USAGE
OF PRIMARY CARRIER WEB OFFERING

Item	Regular	Not Regular	P > F
	User	User	
Plans to increase use of e-marketplaces	4.48	3.32	.003
Sees great potential for e-marketplaces	4.90	3.64	.006
Truck carriers should provide services similar to those LTL provide	5.67	4.91	.049
Internet freight posting service importance	4.43	2.96	.000
Internet pricing service importance	4.35	2.84	.000
Internet tracking service importance	5.66	4.03	.000
Internet POD service importance	5.06	3.65	.000
Satellite tracing and communication importance	5.29	4.86	.045

Note: Means are calculated with a seven-point scale with higher scores indicating higher amounts of attribute.

TABLE 4
MEANS FOR ITEMS BY ENDORSEMENT OF PAPERLESS BILLING

Attribute	Endorses	Doesn't Endorse	P > F
	Paperless Billing	Paperless Billing	
Sees great potential for e-marketplaces	4.82	3.84	.045
Firm understands XML	4.28	3.18	.022
Internet pricing service importance	3.53	3.05	.019
Internet tracking service importance	4.90	4.21	.004
Internet POD service importance	4.78	3.72	.000
Traditional EDI capabilities importance	4.78	4.32	.030

Note: Means are calculated with a seven-point scale with higher scores indicating higher amounts of attribute.

TABLE 5
MEANS FOR ITEMS BY FREIGHT POSTING

Attribute	Posts Freight on Internet	Doesn't Post Freight	P > F
Plans to increase use of e-marketplaces	4.48	3.32	.005
Sees great potential for e-marketplaces	4.69	3.78	.042
Internet freight posting service importance	4.46	3.16	.000
Internet pricing service importance	4.18	3.07	.000
Internet tracking service importance	5.21	4.28	.000
Internet POD service importance	5.00	3.84	.000
Satellite tracing and communications	5.57	4.87	.000

Note: Means are calculated with a seven-point scale with higher scores indicating higher amounts of attribute.

shipments' visibility increased. This enables the accurate prediction of shipment arrival times, which enhances just-in-time systems by allowing inventory levels and safety stock to be minimized (Krapf 1997). Clearly, carriers seeking to develop web offerings reflective of the needs of shippers should strongly consider incorporating some form of web tracking into their system.

The findings of this study also suggest that the overwhelming majority of shipping firms do not participate in e-marketplace services. For example, only 20% classify themselves as "regular" users of their primary carrier's e-marketplace, and only seven per cent reported that they currently post truckload freight on Internet e-marketplaces. Despite offering cost-efficiency advantages, shippers seem to view e-marketplaces as a risky and expensive alternative to traditional shipper/freight matching methods. Evidently, most shippers currently tend to view the costs of participating in e-marketplaces as outweighing their potential benefits.

The results of this study support the idea that firms currently using the various aspects of e-marketplaces tend to be more positive regarding their expected future usage of and attitudes towards e-marketplaces than their non-user counterparts. This is actually not surprising. In light of the considerable start up costs associated with becoming initially involved in an e-marketplace, one would expect that shippers currently using e-marketplaces would be more prone to increase their usage than those that have yet to incur the initial cost. Another possible explanation for this finding is that, due to the perceived risk of using e-marketplaces, firms may begin their e-marketplace participation by experimentally shipping only a small percentage of their freight. As their confidence in the system grows, they will presumably trust increasingly larger percentages of their shipments to e-marketplaces. Assuming positive e-marketplace experiences, shippers at this stage of the process would naturally indicate a tendency to increase their e-marketplace

usage. Apparently, these firms like what they are experiencing and want more in the future.

MANAGERIAL IMPLICATIONS

From a carrier's perspective, e-marketplaces should not be ignored as a source for finding freight. Shippers indicated that they were more likely to increase their usage for e-marketplaces than decrease their usage. Truckload carriers should take note of what LTL carriers are doing with regard to their company web sites. This was the most strongly agreed with statement by the shippers in the survey. Additionally, carriers should prioritize their future web offerings to include tracking, freight posting, and pricing in that order. Carriers should not necessarily expend resources to create their own e-marketplace. Shippers overwhelmingly prefer not to post their freight on a carrier maintained e-marketplace. Finally, keep the resources flowing to the satellite communications and EDI applications, shippers ranked those two areas as the most important.

From a shipper's perspective, the usage of transportation e-marketplaces is clearly evolving and is in the infancy stage. Shippers who are currently using an e-marketplace service reported that they are

generally satisfied. Additionally, much more importance was placed on traditional EDI and satellite communications by shippers, than on the more contemporary web-based applications such as pricing and freight posting.

From the e-marketplace perspective, the good news is that shippers using such services are more positive towards e-marketplaces than nonusers. The simple fact that they are bodes well for the future of e-marketplaces in the transportation industry. Consider the consequences to trucking e-marketplaces if participating shippers were generally dissatisfied with the process and, as a result, held a negative attitude towards the possibility of increasing their future usage levels. No doubt, this negative word-of-mouth would have a devastating effect on the future of e-marketplaces in this industry.

Essentially, these user firms are the early adopters of e-marketplace technology. As is generally the case with the diffusion of any innovation, early adopters play a key role in leading the opinions of the later adopting groups. Thus, the experience of these early adopting groups will largely determine the long-term prospects of e-marketplaces. Fortunately for the e-marketplaces, their experiences appear to be positive.

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LOGISTICS EDUCATION AT HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

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ABSTRACT

A review of research literature on logistics education reveals disparities between demand for and supply of logistics management skills. Racial minorities are relatively underrepresented in logistics education and professional careers. In order to meet the rising demand for college graduates and mitigate racial disparities in the field, a need arises to enhance logistics education at Historically Black Colleges and Universities (HBCU's). HBCU's are known to have a high rate of success in retaining and graduating African American students. Yet, only a few of these institutions offer logistics degree programs or concentrations within the business and social science majors. This article makes a case for enhancing logistics education at HBCU's through program development, recruitment, and retention strategies. It argues that the coordination of activities and partnerships between the institutions offering the programs, high schools/community colleges, and employers of the graduates and government are essential for the success of such strategies.

INTRODUCTION

The demand for professionals who can manage logistics¹ functions and processes has grown rapidly. At the same time, academic programs capable of producing such individuals have been slow to meet this need. As a result, there is a relative scarcity in the supply of college graduates with skills that allow them to manage logistics activities and to create and maintain partnerships with vendors, customers, and service providers (Closs and Stank 1999). Moreover, racial minorities have been underrepresented in logistics education and careers relative to the percentage of minorities in higher education and in the labor force, respectively (Addus and Lee 1992). The number of Historically Black Colleges and Universities (HBCU's) with logistics programs is very limited. Only a few HBCU's offer logistics degree programs or concentrations within business and social science programs (Addus and Lee 1992).

The purpose of this article is to enhance minority participation in logistics education and professional careers by improving logistics programs at HBCU's. It presents brief discussions on the demand for and supply of logistics education in the nation, and the role of HBCU's in logistics education. Based on these discussions, the paper recommends strategies for enhancing logistics education at HBCU's. These strategies aim at (1) developing new logistics degree programs at HBCU's with no such programs; (2) recruiting capable and informed potential minority logistics majors for these and existing programs at HBCU's and non-HBCU's; (3) raising the retention and graduation rates of minority students enrolled in logistics degree programs at HBCU's and non-HBCU's; and (4) producing minority graduates who are capable of effectively managing logistics activities in the globally competitive environment.

THE DEMAND FOR LOGISTICS EDUCATION

The demand for logistics education is divided into student demand for logistics education and employer demand for logistics graduates. In the mid 1980's, some studies reported that in spite of the growing demand for people in the logistics profession, the number of qualified students entering the field was diminishing, and this was primarily attributed to the lack of relevant information available to potential logistics majors on the nature of logistics degree programs and career opportunities (Roos 1985). Over the past two decades, the level of understanding regarding logistics, as it relates to managerial decision and government policy, has substantially increased. Accordingly, logistics has received increasing recognition as a vital business function and educational discipline. However, in many cases managers and policy makers continue to view logistics as a support function rather than a strategic tool, which suggests the need for continued progress in logistics education. It was suggested and widely accepted that a good understanding of the nature of logistics activities and cooperation between academia and industry would mitigate the problem (Roos 1985; Faucett, Vellenga and Truit 1995).

The last quarter of the 20th century has seen vast changes in the United States logistics system. The major factors driving such changes include deregulation of the transportation industry, the growing utilization of just-in-time inventory systems, competition based on high customer service levels, globalization, and the development of the Internet. By all indications, this trend will likely continue through the current century. The need to increase logistics professionalism will be one of the greatest challenges of the new millennium (Johnson et al. 1999; Coyle,

Bardi and Novack 2000; Chopra and Meindl 2001).

Following economic deregulation of the nation's transportation carriers, a massive restructuring in the transportation industry occurred. As a result, by 1990 the railroads dramatically improved their return on investment (Lynch 1998; Tyworth, Cavinato and Langly 1991). New forms of carriage, practices and freedom, coupled with the proliferation of the freight rate-service quality mix dramatically altered the transportation service selection and logistics decision-making framework (Tyworth Cavinato and Langly 1991). Further, the business focus has become increasingly global in scope. With the expected high rate of growth in world trade, moving resources and finished goods between sources of resources, production points and consumption centers presents significant logistics challenges (Ratliff and Nulty 1996). With the development of the Internet and e-commerce and the resulting home delivery of products, transportation costs have increased in retail businesses. On-line firms deliver products in small packages directly to their customers instead of large quantities (in truck loads with lower per unit transportation cost) to retail outlets. As a result, the proportion of transportation cost to the total delivered product cost has increased. Thus, the success of integrated logistics² is closely related to the appropriate use of transportation, and effective transportation is essential for the success of any on-line business. These businesses rely on effective and convenient transportation to satisfy their customer needs (Chopra and Meindl 2001).

These developments in logistics activities will no doubt lead to higher demand for college logistics graduates. The field of logistics is so large and complex that almost any private or public organization may be viewed as a

potential employer of the logistics manager. The types of organizations most likely to employ logistics professionals include transportation carriers, manufacturers, wholesale distributors, retailers, public warehouses, consulting firms, publishers, computer and other service firms, universities, and government (Johnson and Wood 1986).

THE SUPPLY OF LOGISTICS EDUCATION

The supply of logistics education can be divided into two parts: the supply of logistics degree programs and the supply of logistics graduates. Prior to the 1980's, logistics-related activities in business management, public administration, urban and regional planning, and other social sciences were often overlooked by the transportation community (Michael 1985). The total number of institutions offering logistics programs was limited in relation to other fields of study, and most of these programs have been relatively small in size. Faculty shortages and time constraints within program settings were two of the main factors precluding growth and improvements in logistics curricula (Spsychalski 1985; Southern 1986; Zinszer 1986).

The traditional business logistics functional perspective within the framework of higher education is increasingly changing along with changes in related economic forces. However, increasing demand has clearly exceeded the supply of qualified personnel in the area (Closs and Stank 1999). Senior logistics managers in various organizations cite obtaining individuals trained in integrated logistics as their major concern for the near future. The emergence of these fields as major business disciplines has led to an increase in the number of courses and programs specifically designed to teach

logistics management at the college/university level. However, logistics' significance to businesses, the economy and society as a whole has not been fully supported by the number of logistics programs and courses offered at higher learning institutions in the nation (Faucett, Vellenga and Truit 1995).

Although many firms seek logistics college graduates who can manage various logistics activities (such as transportation cost analysis, scheduling, pricing, warehousing, purchasing, materials management, and inventory control), a significant proportion of logistics jobs are filled by non-logistics-trained personnel due to shortages in the supply of logistics-trained individuals. Logistics career patterns indicate that most logistics professionals and executives do not hold degrees in logistics, but in various other areas of business administration (Zinszer 1986; Wood and Johnson 1996). In the new millennium, the most fundamental change affecting logistics operations will likely be a shift from the "downswing" business mentality of the 1980's and early 1990's to one of growth, which requires more qualified manpower to carry out essential logistics activities (Hale 1999). It has been predicted that the gap between the demand for and supply of logistics professionals will intensify unless the growing demand is matched by efforts to expand training programs. Businesses will have to compete fiercely for logistics graduates and, because of shortages of properly trained logistics personnel, some businesses could be forced to entice retirees back to work (Hale 1999).

THE ROLE OF HBCU'S IN LOGISTICS EDUCATION

HBCU's play a pivotal role in educating racial minorities, particularly African American students. A brief description of the status of logistics education at HBCU's

serves as a prelude to the justification of this role and strengthens the case for enhancing logistics education at these institutions.

The Status of Logistics Education at HBCU's

Historically, racial minorities had difficulty in achieving equal employment opportunities in transportation and logistics. Usually, the jobs available to them were at the entry level with lower pay (Johnson and Wood 1986). Over the past several years, job participation of minorities in the private transportation sector and related areas has improved. Yet they are not at par in logistics careers, particularly at professional and administrative levels. A major factor that has contributed to this situation is the underrepresentation of racial minorities in logistics education (Addus and Lee 1992).

Due to the U.S. Department of Transportation's initiatives of the 1970's and 1980's, specialized programs limited to a few HBCU's were mostly geared to careers in urban transportation. There was an emphasis on the need to establish and improve logistics programs at minority institutions (Dorsett and Benjamin 1984). Currently, there are about 115 HBCU's in the United States (Frieson 2001). Only six of these institutions offer transportation and/or logistics programs. Two of these institutions offer only bachelor's degree programs, two offer only master's degree programs, and two offer both bachelor's and master's degree programs. A total of 11 undergraduate and graduate programs are offered by these six institutions. Two of the programs are in air science, three in urban transportation planning, two in transportation engineering, and four in logistics. Three of the logistics programs are concentrations within the business management area. Thus, only one institution offers a full-fledged under-

graduate logistics degree program (see Tables 1 and 2). At the national level, about 85 of the estimated total of 1,500 four-year predominantly white colleges and universities offer logistics degree programs (Internet Search 1997; *Webster's Dictionary* 1989). The relative attention accorded to logistics education at HBCU's has been inadequate in addressing the issue of minority underrepresentation in the profession. Although it is considered to be an important and emerging discipline, logistics remains one of the least understood fields of

study for prospective students at higher learning institutions, particularly at HBCU's (Addus and Lee, 1992). The situation calls for more efforts to promote awareness among minorities, and improve logistics education at HBCU's, particularly at the undergraduate level. The efforts are warranted by the fact that logistics education equips college graduates with skills required for rewarding careers in modern society, thereby mitigating racial disparities in the nation's work force (Faucett, Vellenga and Truit 1995).

TABLE 1
UNDERGRADUATE TRANSPORTATION/LOGISTICS PROGRAMS AT HBCU'S

Institution	Program
Alabama A&M	Logistics Track in Business Administration
Delaware State	Airway Science
Hampton	Airway Science
North Carolina A&T	Transportation/Logistics
	Transportation Engineering

Source: Internet Search, <http://www.Endoline.com/hbcu>; and individual HBCU web sites.

TABLE 2
GRADUATE TRANSPORTATION/LOGISTICS PROGRAMS AT HBCU'S

Institution	Program
Alabama A&M	Logistics Track in Business Management
	Transportation
Morgan State	Transportation Planning
North Carolina A&T	Logistics Track in Management
	Transportation Engineering
Texas Southern	Transportation Planning

Source: Internet Search, <http://www.Endoline.com/hbcu>; and individual HBCU web sites.

The Case for Logistics Education at HBCU's

HBCU's have played a significant role in educating African-Americans throughout United States history. About 90% of HBCU's are four-year institutions. These institutions are willing to accept students with academic deficiencies and provide them with skills that qualify them to pursue careers in society. They offer a higher rate of success in graduating African-Americans with bachelor's degrees compared to the percentage of African-Americans graduating from predominantly white institutions. This success is attributed to the fact that (1) HBCU's are prepared to offer more remedial courses for freshman students with relatively poor high school academic background; (2) because of a more supportive environment, students at HBCU's are confident and more interactive with faculty than African-American students at other institutions; and (3) students at HBCU's exhibit lower rates of withdrawal than African-Americans at predominantly white institutions (Kourtellos 2001).

A survey of African-American scholars at HBCU's indicated that most of the scholars would recommend HBCU's to African American students for their higher education careers (Frieson 2001). Many of these scholars feel that these institutions provide social and psychological benefits to students that cannot be duplicated by predominantly white institutions. On the other hand, only 23% of African-American students enrolled in predominantly white institutions reported that counseling and advising services seemed sensitive to their needs, and about 32% of minority students said their campuses made special efforts to give them a sense of belonging (Frieson 2001). Thus, the enhancement of logistics education at HBCU's would have greater impact on the success of racial

minorities in the field than similar improvements at other institutions.

STRATEGIES FOR ENHANCING LOGISTICS EDUCATION AT HBCU's

Given the rising nationwide demand for and relative shortage of logistics professionals, the need for concerted efforts to develop and enhance logistics education is justified. Racial disparities in logistics education and the significance of HBCU's in the success of African-American students call for the design and implementation of effective strategies to develop, improve, and enhance logistics education at HBCU's. Such strategies should include effective program development, recruitment, and student retention policies that will result in producing highly skilled and competitive logistics graduates through internal coordination and external partnership.

Internal Coordination and External Partnership

The process of developing and implementing strategies for enhancing logistics education at HBCU's requires effective coordination of activities within the institution offering the degree program and sound partnerships with business organizations, educational institutions, and government agencies. In order to produce competitive logistics graduates, a relevant program has to be developed, qualified students have to be recruited, and these students have to be retained and trained appropriately. Logistics education is interdisciplinary in nature and is related to various fields of study in business, economics, engineering and other social sciences. The success of the program demands effective coordination between the program and other academic programs as well as institutional support services. In

addition, as the major training base for highly skilled professionals, the institution should work in close partnership with high schools and Parents and Teachers Associations (PTA's) as sources of qualified potential logistics professionals, and with transportation carriers, industry and government as supporters of the program and employers of the graduates. The activities involved in internal coordination and external partnership are essential for the implementation of the three strategies presented below, which are proposed to help enhance logistics education at HBCU's and achieve racial parity in the profession.

Program Development Strategy

For HBCU's with no logistics degree program, a gradual approach in a stage-development scheme is recommended. The stages in such a scheme include (1) developing logistics courses and integrating them into business administration and/or other relevant programs as required courses; (2) developing a logistics concentration within business administration and/or other relevant programs; and (3) developing logistics degree programs.

Federal and state funds are available for developing transportation and logistics programs, with federal funds being limited to urban transportation programs. Currently, federal funds (such as from Transportation Centers and Urban Transportation Institutes) are available for research and student scholarships. The availability of state funds for developing logistics programs depends largely on the state of the economy. In recent years, many states have experienced financial shortfalls due to economic difficulties. A case in point is a new master of science program with a concentration in logistics that was implemented at North Carolina A&T State University (NCA&TSU) in the

2001 fall semester without additional appropriations or faculty positions from the State. Therefore, financial support for development, faculty positions and assisting qualified students must be sought from private business organizations and related foundations.

Recruitment Strategy

Historically, logistics education at most universities has been primarily pursued by graduate students and/or returning professionals (Dorsett and Benjamin 1984). If a meaningful gain in undergraduate logistics enrollment is to be achieved, the pool of young potential logistics professionals must be expanded. Since the primary source of potential logistics majors are high schools, innovative recruiting efforts must be directed toward high school minority students, particularly at the junior level (Dorsett and Benjamin 1984).

Unlike many other fields of study such as economics, business administration, engineering, and other social sciences, logistics is not typically familiar to most high school students, their parents, teachers, and guidance counselors. Most people are simply not aware of logistics management programs or courses offered at higher education institutions, and of career opportunities in this field. Even many high school counselors and others who influence career directions of young people are apparently unaware of logistics degree programs and career opportunities available to college graduates (Roos 1985). Thus, an effective recruiting strategy for the logistics degree program should address the awareness of the program and career opportunities for the graduates among potential majors. A few states have begun to place more emphasis on technical education in the lower levels of the public school system. These initiatives can help

generate interest and awareness, but more efforts are needed at higher education levels to make more people aware of logistics activities and career opportunities available to young college graduates (Faucett, Vellenga and Truit 1995).

Traditional recruitment strategies, such as direct communications and high school visits, may not be overwhelmingly effective in enhancing logistics degree programs, particularly at the undergraduate level. For instance, since few students arrive on campus with knowledge about the logistics curriculum or potential careers, the transportation/logistics degree program at NCA&TSU has, to a large extent, been dependent on University students transferring from other academic programs after having been admitted to the University. These transfer students within the University are usually informed of the program by the faculty and/or logistics majors after arrival on campus.

In order to attract qualified high school graduates to logistics degree programs, efforts can be exerted to expose high school minority students by coordinating awareness programs in the form of summer training institutes. For example, in an effort to improve the logistics degree program at NCA&TSU, a five-week Summer Institute, funded by the U.S. Department of Transportation under the auspices of the Transportation Institute, was initiated in 1993.³ The training activities were conducted in cooperation with transportation carriers, shippers/receivers, and government agencies at local, state and federal levels. The University's logistics enrollment started growing in 1994 following the implementation of the first High School Summer Institute as indicated by the significant increase in freshman logistics enrollment during the 1995 spring semester (Annual Report 1995). The subsequent summer institutes helped further

increase logistics enrollment and improve the quality of student preparations in the program. Overall, the implementation of the Institute's program helped expand the pool of qualified minority students prepared to enter the logistics profession, strengthened the logistics program at NCA&TSU, and will help foster diversity in logistics education and career opportunities.

In addition to student awareness programs, a summer workshop may be coordinated on campus for selected high school teachers and guidance counselors. The workshop is to be geared toward continued education with the purpose of exposing these teachers to materials in logistics courses. A package can be prepared for high school social studies teachers to help them integrate the basic logistics education into the social studies curriculum. Similarly, high school counselors can be supplied with a general package containing relevant material for publicizing career opportunities in logistics for their advisees. In addition, PTA's may be provided with information that enlightens them on logistics career choices.

Community colleges can be used as another source for recruiting minority students who are interested in logistics careers. Many community colleges offer associate degrees in technical fields related to transportation. For example, in North Carolina, Guilford Technical Community College offers five such programs in auto body repair, automobile systems technology, heavy equipment and transport technology, aviation system technology, and aviation management and career pilot technology (Internet Search 2002). Information on logistics degree programs and careers may be disseminated to these colleges with particular attention to minority students who may be interested in pursuing a college degree after graduation. In addition, community colleges may be encouraged

to offer introductory logistics courses to expose minority students to logistics.

Within HBCU's and non-HBCU's offering logistics degree programs, awareness of the programs can be strengthened among minority students through academic advisors, instructors and logistics majors. Special attention can be directed toward students undecided on their majors and those who contemplate changing their majors. Moreover, as the logistics degree program is logically an integral part of the business curriculum, all business majors could be required to take at least one logistics course. Additionally, relevant logistics material should be covered in the business common body of knowledge. Such a scheme not only broadens the students' general knowledge of business, but also creates an awareness of logistics activities and opportunities in the field.

Student Retention Strategy

The logistics curriculum is naturally interdisciplinary, relating to disciplines within business administration, economics, engineering, and other social sciences. This calls for effective and close coordination of training and retention activities with other academic programs within the institution offering the logistics degree program. Student participation in research projects and internship programs with transportation carriers, industry and government are important components of academic training. These activities enable the students to understand complex logistics academic problems and practical applications. Logistics graduates can be tracked in order to assess the relationship between their academic training and progress in their careers. Also, the graduates can be invited back to their alma mater to address logistics majors regarding the role of their academic

background on their careers. Employers can be directly and regularly contacted for information on their specific employment needs. The curriculum may be reviewed/revised periodically to make sure that the changing needs of employers are met in the training process. Logistics is a dynamic field that changes rapidly. Accordingly, logistics degree programs at HBCU's should reflect these changes continually.

An effective retention program at each HBCU requires the coordination of efforts between all the units of the institution. Such a program may not succeed unless the entire university environment is conducive for student development. Students should be advised, consulted and monitored at departmental and school levels as opposed to the university level. In many cases, student counseling at the university level may not achieve the intended results. Adjustments and/or improvements in other non-logistics programs offering prerequisite and/or supporting courses may be required. Also, administrative support services relating to admission standards, registration requirements, financial aid programs, career planning, and overall student campus life affect student retention efforts. Effective coordination of activities between various institutional units and active participation by each unit are essential for the success of a retention program.

In summary, the success of retaining minority students and graduating the highest possible percentage of the students admitted into logistics degree programs depends on:

- (1) recruiting qualified students capable of meeting the requirements and challenges of completing the program within a reasonable time period;

- (2) academic remedial programs for students with academic deficiencies in specific areas;
- (3) instilling in students competitive skills and knowledge that will enable them to excel in their professional careers after graduation;
- (4) mentoring, counseling, and monitoring services;
- (5) financial aid services;
- (6) career services; and
- (7) student campus life, including housing and board, campus security and recreational facilities.

CONCLUSION

During the last two decades of the 20th century, the demand for logistics college graduates has been very strong relative to the supply. This demand is expected to be even stronger during the current century, providing great opportunities to minorities to increase their participation in logistics careers.

Historically, minorities were underrepresented in logistics education and careers. However, within the past decade, they have made some progress toward increased representation in the profession. Higher logistics education is essential for building on this progress and further enhancing minority opportunities in the industry. Since HBCU's are known to graduate a higher percentage of African-American students than non-HBCU's, they can play a vital role in increasing minority participation in logistics professional careers. Improvements in logistics education at HBCU's would enhance minority participation in the profession.

There is a need to encourage more HBCU's to develop logistics degree programs and aggressively recruit minority students to these and existing programs at HBCU's and non-HBCU's.

The use of program development, recruitment, and retention strategies at HBCU's based on strong partnership and cooperation within the logistics community, including educational institutions, industry and government, would lead toward achieving this objective. Such activities, with proper logistics curricula preparing graduates to succeed in the modern competitive and global environment, provide the solutions for more diversified future logistics manpower needs of the nation. Overall, the presence of minorities in the logistics profession will be enhanced if (1) more attention is given to logistics education, particularly at HBCU's; and (2) efforts are exerted to change the image of logistics among potential students and the general public.

ENDNOTES

1. Logistics is defined as the coordination of transportation and storage activities in order to achieve the efficient movement of materials, products, and information into, through, and out of a firm.
2. Integrated logistics or supply chain concept deals with the management of the flow of materials, products, and information from the source of raw materials to the final consumer, thus, linking logistics activities of different organizations.
3. The Transportation Institute is an interdisciplinary unit which draws faculty, staff, and students from various schools of North Carolina A&T State University. It conducts research, public

service and training programs in the field of transportation and logistics. It provides substantial financial assistance to students who are awarded research assistantships to help in developing and

conducting funded projects. The Institute also serves as a resource for planners, public officials, and community groups in helping them solve transportation problems.

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INDUSTRY-WIDE RESPONSE TO TERROR: A POLITICAL ECONOMY ANALYSIS OF THE OWNER/OPERATOR SECTOR OF THE U.S. MOTORCOACH INDUSTRY POST 9-11

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ABSTRACT

The authors develop a political economy framework to study the post- September 11th environmental changes and firm responses in the owner/operator sector of the U.S. motorcoach industry. Based on a comprehensive analysis of both evolutionary and revolutionary changes in the competitive and regulatory environments faced by the firms in this industry, their policy and strategic responses to the terrorist acts of September 11, 2001, on U.S. soil are examined. The industry's response is captured (i.e., collective action response) by surveying 163 firms operating and competing in the owner/operator sector of the U.S. motorcoach industry. Several descriptive statistics are synthesized and analyzed for a structured presentation of the survey findings. In conclusion, contributions and limitations of this study, as well as directions for future research, are outlined.

INTRODUCTION

U.S. transportation sectors adapted promptly to the challenges engendered by the terror attacks on U.S. soil September 11, 2001. Though initially grounded at U.S. borders, motor carriers responded effectively to requests for expedited shipments. Rail faced some slowdowns, but recovered quickly enough for Norfolk Southern to contribute 1,000 rail cars to transport debris free of charge in the World Trade Center cleanup (Morton, Hyland, Aichlmayr, and Freeze 2001). The U.S. air cargo carriers suffered heavy losses when the Federal Aviation Association banned air travel for two days following the attacks on Washington D.C., and New York City (Freeze 2001), but was back to full speed by week's end. Though these short term coordinated efforts returned the nation's transportation and logistics networks to normal and this operational recovery provided some sense of security, much less is known about specific policy and strategic responses to terrorism-induced environmental change faced by specific sectors of the transportation network.

The purpose of this research is to identify the emerging patterns of policy changes to episodic events of terror and systemic strategic responses in emergency preparedness of the owner/operator sector of the motorcoach industry in light of the attacks and subsequent war. The vehicle to explain such reaction is the political economy framework (see Stern and Reve 1980, and Achrol, Reve, and Stern 1983).

This transportation sector's response patterns are analyzed by looking at the actions and intentions of the firms operating and competing in the U.S. motorcoach industry in the months following the terror attacks on New York City and Washington D.C. The focus on the owner/operator sector

of the motorcoach industry as the backdrop is due to this sector's functioning at the boundary of transportation and travel/tourism industries, as both of these industries have been hit hard by terror (Pizam and Fleicher 2002). Before discussing the results of the research, a review of the state of the U.S. motorcoach industry is presented.

THE U.S. MOTORCOACH INDUSTRY: FOCUS ON ITS OWNER/OPERATOR SECTOR

The charter and tour portion of the motorcoach business tend to be family-owned, requiring long hours with much of the charter work occurring on weekends. It involves enormous capital expenditures offset by historical 15-20% profit margins. During the late 1990's many changes occurred which had tremendously negative effects on the industry. Consolidation was a leading threat to many independents. Revenue was flat, new equipment costs were escalating and overcapacity in the market was becoming commonplace. Marketing was a virtually unknown concept with owners adopting an order-taking approach rather than marketing their business. Low entry barriers encouraged small, inexperienced players to join. Lending companies encouraged new entrants and rapid growth with comparatively easy financing terms resulting in increased sales of new equipment. Motorcoach companies were viewed by many customers as undifferentiated, with price as the major distinguishing factor. Therefore, when the new entrants finally realized the total operating costs, these companies could not afford the payments and repossessions became commonplace.

The motorcoach industry is comprised of three major business segments: charter, linehaul, and tour. The largest segment,

charter work, which represents hauling persons from point to point, comprises 72% of the business, yet represents the lowest margin. Line haul (e.g., designated routes from city to city or to airport terminals) represents 18% of all motorcoach business and tour groups comprise 10% of the motorcoach business. During the late 1990's tour groups represented 14% of the business in the industry and line hauls were 15% of the business. The demand for motorcoach tours has fallen while the demand for line hauls has risen, yet few owner/operators are involved in line haul business. Almost 96% of the motorcoach companies are involved in charter operations (i.e., the hiring of a motorcoach for a specific group) and only 12% of the companies are involved in line hauls. Those companies operating routes utilize approximately 8,000 to 10,000 motorcoaches and account for 50 percent of all motorcoach mileage (UMA, 2001).

The motorcoach provision market is made up of two core groups: independents and consolidators. While the independents represent small and mid-size companies and a handful of large companies, the recent trend toward consolidation has emphasized the negative state that the industry faces. Consolidation by the three largest players (CoachUSA, Laidlaw and VEC Tours) was at first envisioned to develop economies of scale due to vastness in size and characterized by centralized management and operating efficiencies. However, the resulting overall financial performance has not been superior to the independent operators and regionally managed consolidators have not best served the interests of customers in developing on-going relationships.

In a 2000 Survey conducted by R. L. Banks & Associates, the motorcoach industry was estimated to be comprised of roughly 4,000 firms and about 10 percent of those are based

in Canada (Schulz 2001). These companies operate approximately 44,000 buses. The companies in the industry range from very small (those companies with less than five coaches) to the largest consolidator that has almost 3700 coaches. About ninety percent of the industry is comprised of small businesses operating fewer than 25 coaches. These companies run about 19,000 buses or slightly more than two-fifths (40 percent) of the total fleet and account for almost two-fifths of the total industry mileage. It is estimated that almost 2000 companies operate with fewer than 5 coaches and 65% of the companies are operating with fewer than 10 buses (ABA, 2000). Yet, the industry provides jobs for almost 200,000 workers and generates approximately \$7.4 billion in business.

The mid-sized segment is comprised of approximately 320 firms that operate between 25 and 99 buses each. These companies run about 14,000 buses or almost one-third (31 percent) of the fleet and account for about one-third of the industry mileage (ABA, 2000).

The large segment in the industry is comprised of 50 firms that operate 100 or more buses (UMA, 2001). The top 50 firms had total buses in 2001 of 19,047 but the total had fallen to 14,007 by the beginning of 2002 (Staric, 2002). The largest companies operate about 11,000 buses or about one-fourth (25%) of the fleet and drive 30 percent of the total industry mileage (ABA, 2000).

Each motorcoach carries over 20,000 passengers per year on average, although there are wide variations between firms, with larger operations and scheduled service companies reporting higher average ridership. Larger carriers, those operating 100 or more buses, carry an average of 26,000 passengers per bus annually. The mid-size companies range between 9,000 to

18,000 passengers per bus. Smaller companies with fewer than 24 buses carry about 9,000 passengers per bus annually (ABA, 2000).

A fully loaded motorcoach (i.e., 46 passengers on average) on a charter or tour making an overnight stay contributes an average of \$5,000 to \$7,500 per day to the local economy in expenditures including meals, lodging, shopping, admission fees, souvenirs and local taxes (ABA, 2000). The 1996 direct economic impact of the group tour business in North America was more than \$11.6 billion. In Washington, D. C. alone, 23.4 percent of 21 million annual visitors arrive by motorcoach. If only half of those visitors came as part of an overnight tour, \$424 million flows into those local businesses (George Washington University, 2001).

Three consolidators are key players in the industry. Coach USA has 3,685 motorcoaches and is comprised of 188 companies representing 10% of the industry. Laidlaw Greyhound owns 2775 motorcoaches and is predominantly a line haul company with less than 1% of their business generated by tours and charters. VEC Tours has 870 motorcoaches and represents 1% of the business with 16 companies (Starcic, 2002). In U.S. Bankruptcy Courts, VEC filed for Chapter Eleven bankruptcy protection from creditors as business plummeted as a result of the terrorist acts of September 11, 2001. Though motorcoach carriage represents a mere 2% of overall passenger transport in the U.S., motorcoach carriers transport more passengers in two weeks than Amtrak transports in an entire year. Thus, how this industry responds to terror may offer insight into other transport sectors and to business in general.

THE STUDY

For the development of the analytical framework to guide the study, it was important to distinguish between two emerging constructs in the extant literature, emergency preparedness and homeland security. Emergency preparedness is related to the proactive groundwork laid by firms in their contingency preparation for potential acts of terrorism. On the one hand, terrorism by its very nature is episodic. On the other hand, homeland security is systemic. That is, homeland security is the operating foundation/force of a firm's emergency preparedness policy. In other words, it is not a matter of choice, but rather it has to be considered an imperative in light of the episodes of terror or threats of terror. As a result, it has become an integral part of a firm's decision making context for risk management.

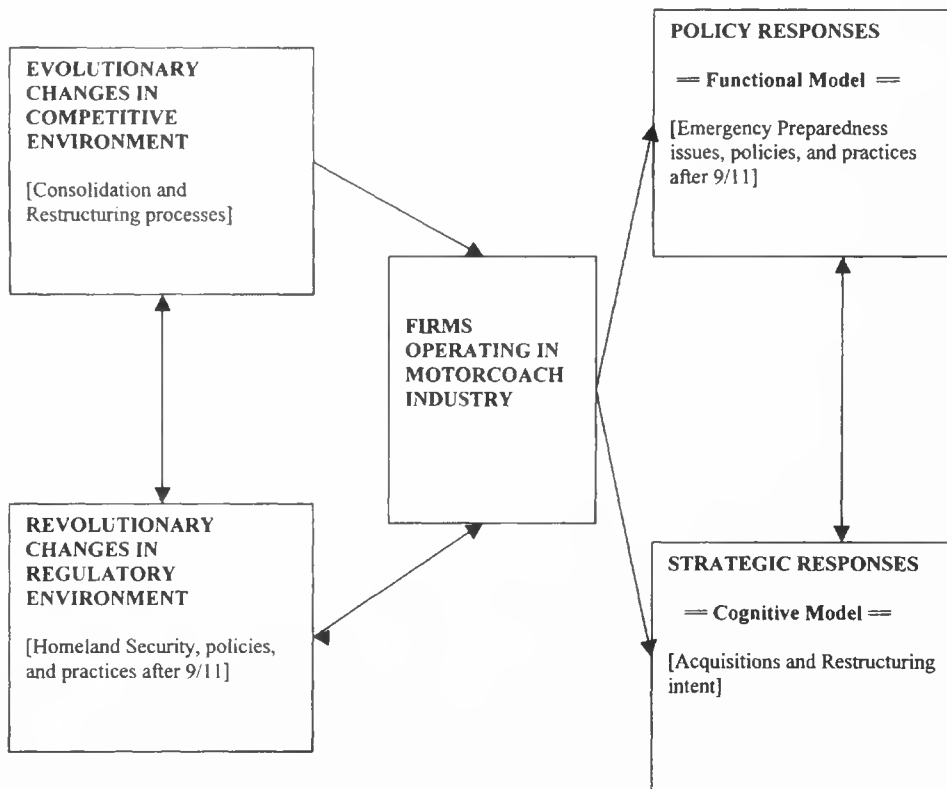
Following the foundational work by Stern and Reve (1980) and Achrol, Reve, and Stern (1983), the model for empirical examination of industry-wide response to terror in the motorcoach industry is a political economy framework. The political economy framework adapted for the post-9/11 motorcoach industry environment is capsulated in Figure 1. As indicated, there are two primary driving forces: (1) evolutionary changes in the competitive environment (e.g., consolidation and restructuring processes), and (2) revolutionary changes in the regulatory environment (e.g., homeland security, policies, and practices after September 11th). Both drivers have mutually interacting economy components and a polity. These forces then influence the operating environments of the firms competing in the motorcoach industry, eliciting their policy

responses (e.g., emergency preparedness) and strategic responses (e.g., acquisitions and restructuring intentions).

Grounded in the model of a political economy-adapted framework of post-9/11 environmental change in the motorcoach industry (See Figure 1), the study seeks to make a significant contribution to emerging arena of research examining how homeland security changes are mapped onto emergency preparedness as a firm's proactive approach to the threat of episodic terror events, often mandated through regulatory intervention.

An additional unique contribution of this research is the unit of analysis. The members for the sample frame are owner/operators. Owner/operators have received very little attention in transportation and tourism travel research, as the most common sampling is done at the customer or passenger level. In our study, we queried owner/operators in order to assess firm-level responses and intentions in a post-9/11 marketplace.

FIGURE 1
POLITICAL ECONOMY FRAMEWORK OF POST-9/11 ENVIRONMENTAL CHANGE IN THE MOTORCOACH INDUSTRY



Note, in Figure 1, the role of government (i.e., federal, state, local) has been omitted from the equation (i.e., model) of environmental change in the motorcoach industry. In contrast to the bailing out of the airline industry by federal mandates, the motorcoach industry was forced to absorb the cost of change. In general, it is crucial to define the concepts, related issues, policies, and practices of homeland security and emergency preparedness at governmental, firm, and emerging industry levels in order to explain how the interaction between changes in regulatory and competitive environments influence the outcomes and interactions of motorcoach firms' policy and strategic responses.

RESEARCH METHODOLOGY

Owner/operators of motorcoach firms in the U.S. were chosen as key informants in order to capture the most robust data available. Respondents filled out a detailed questionnaire at one of two national conventions in January and February, 2002. Data were recorded and analyzed in the spring and summer of 2002. This sample represents owner/operators that try to proactively shape collective strategies within the two associations that face a radically changing political economy environment and act on behalf of the entire sectorial membership.

Population and Sampling Issues

The population of interest in this research was all motorcoach operators in the U.S. as of September 11, 2001. The sample frame of interest consisted of all those owner/operators in attendance at one of two national conventions: Indianapolis in January 2002, and Orlando in February 2002.

Following Campbell (1955), key informants were asked to fill out questionnaires. Key informants are identified as owner/operators of motorcoaches in U.S. markets. Key informant bias may exist in the context of gathering information in the form of questionnaires (Phillips, 1982), and may create measurement bias. However, Campbell (1955) and Anderson (1985) demonstrate that key informants provide highly accurate data when they are knowledgeable and communicate with the social scientist. Campbell (1955) suggests that questions be direct, specific, and in the language of the informant. An expert in the industry was engaged in an effort to ensure the data collection method used here met the criteria set forth by Campbell. Questions were designed to achieve clear, specific responses, confined to issues the respondents likely knew and were expressed in their terms. Respondents were assured of anonymity (Jobber and O'Reilly, 1998) in order to receive unbiased responses.

Sample Frame

Motorcoach operators were surveyed at two national conventions. The first convention was the United Motorcoach Association (UMA) Convention held in Indianapolis in January 2002. There were approximately 250 operators in attendance and survey responses were collected from 100 of the operators attending the conference. Additional surveys were collected at the American Bus Association (ABA) Convention. This meeting was held in February 2002 in Orlando. This meeting brought together a specific group of motorcoach owner/operators that sell tours to meet with convention bureaus, restaurants, hotels and destination representatives. At this meeting, an additional 63 surveys were

collected. Only motorcoach owner/operators were surveyed. Some owner/operators attended both meetings. If they had previously completed the survey at the UMA, they did not complete the survey again at the ABA. In all, 163 owner/operators completed the questionnaire. Respondents were asked to fill out the survey on site and were encouraged to fill out the survey in its entirety.

Data Analysis

The data were recorded and analyzed using SPSS 10.1 software. One hundred sixty three useable responses were included in the primary database.

From Table 1 note that all major geographical areas in the U.S. are represented. Thirty-nine percent of the sample was from the Midwest, 38% from the Eastern Seaboard, 14% from the South and 9% from the West Coast. Approximately 90% of the sample was involved in family owned businesses and 38% operated from more than one location. In the motorcoach business, it is common for many owner/operators to have related businesses that supplement their motorcoach business. In the sample, 35% of the owner/operators responding indicated that they were also involved in school bus operations.

Nearly one-third of the respondents operated in 2000 with annual sales between one and three million dollars, while 11% showed sales of greater than \$5 million. Twenty-seven percent of the companies have annual gross sales of less than \$500,000, with 15% having gross sales of equal to or less than \$250,000. Only 5% of the companies fall within the \$500,001-\$750,000 range and

17% of the respondents fall within the \$750,001-\$1,000,000 range. The largest group in the sample, 31%, falls within the \$1,000,000-\$3,000,000 range. Eight percent of the respondents indicated that their gross sales were in the \$3,000,000-\$5,000,000 range and 11% of the respondents indicated that they had gross sales greater than \$5,000,000.

POST 9/11 RESPONSES TO TERROR IN THE U. S. MOTORCOACH INDUSTRY

Operational Responses

September 11 has had a profound effect on the travel industry. The motorcoach industry is an important niche in the travel arena. Motorcoaches in the U.S. and Canada carried an estimated 860 million passengers in 1999.

Sixty-one percent of the owner/operators responding to the survey indicated that their customers are now requesting shorter trips (Table 2). Customers have indicated their unwillingness to travel to larger cities (Table 3), particularly along the Eastern Seaboard, and owner/operators have responded with creative and interesting destinations closer to their homes. If the days traveled and distances vary considerably, the operator will generate less revenue on average. Increased business will be required to offset the loss. This is further compounded when it is noted that 68% of owner operators indicated that some of their customers had been ordered not to travel (Table 4). Many school districts across the country have been ordered not to travel or, if they do travel on school sponsored activities, they must avoid larger cities.

TABLE 1
ANNUAL GROSS SALES

Annual Sales	Frequency	Percent of Total
<\$250,000	22	13.5
\$250,000 - \$500,000	17	11.8
\$500,001 - \$750,000	7	4.9
\$750,001 - \$1,000,000	25	17.4
\$1,000,001 - \$3,000,000	45	31.3
\$3,000,001 - \$5,000,000	12	8.3
> \$5,000,000	16	11.1
Missing	9	
TOTALS	163	100.0%

TABLE 2
CUSTOMERS REQUESTING SHORTER TRIPS

Requesting shorter trips?	Frequency	Percent of Total
YES	97	60.6
NO	63	39.4
TOTALS	160	100.0%

TABLE 3
TRIP DEMAND PROXIMITY TO HOME

Requesting trips closer to home?	Frequency	Percent of Total
YES	98	61.3
NO	62	38.7
TOTALS	160	100.0%

TABLE 4
CUSTOMERS ORDERED NOT TO TRAVEL

Ordered not to travel?	Frequency	Percent of Total
YES	106	67.5
NO	50	31.8
TOTALS	156	99.3%

Nearly 60% of owner/operators indicate their customers are requesting shorter trips. Similarly, 61% are demanding motorcoach trips closer to their place of residence. One hundred and six respondents report that previous customers have been ordered not to travel.

A mainstay of the charter industry, casino charters, has seen some movement as one quarter of owner/operators report that casino demand has decreased since 9/11, and another 15% has seen demand rise (Table 5).

These results indicate that, under the diffuse effects of political-institutional factors, the owner/operators perceive that radical environmental change will likely require a higher level of operational effectiveness within a more localized scope of operations.

Emergency Preparedness Responses

The data indicate that nearly 47% of owner/operators have developed a security plan for their company since 9/11. Thirty six firms have sent statements to customers regarding those measures (See Table 6). Importantly, the line-haul segment would most likely be interested with particular security measures. Line-haul is simply moving passengers from point to point, with low likelihood the driver gets to know the

passenger, as opposed to charter or tour where the driver spends a significant amount of time with the same set of passengers on their excursions.

An analysis of the emergency preparedness variables indicates a mixed response to terror by owner/operators in the sample. For instance, one would expect greater attention to security measures for equipment, drivers, and passengers. Indeed, results indicate that some of these measures are being taken. Forty six percent of respondents have issued identification tags for drivers. Additionally, nearly 81% of respondents indicate that they are vigilantly keeping equipment and baggage service areas locked while not in use. Seventy percent of respondents noted they had installed phones in the coaches, and an additional 49% installed two-way radios. Communication tools allow tours to operate smoothly and allows for coordination.

However, some results appear to be counter-intuitive. Only 17 % of respondents indicate they issue security labels for all baggage. Less than 9% have installed plexi-glass designed to protect the driver of the coach. And only 8% have plans to install cameras aboard their coaches.

Interestingly, only 20 firms responded that they are checking all baggage before loading and merely 43 have increased security equipment in their garage.

**TABLE 5
CASINO BUSINESS**

Casino demand since 9/11	Frequency	Percent of Total
Increased	25	15.6
Decreased	40	25
No Change	95	59.4
TOTALS	160	100%

**TABLE 6
EMERGENCY PREPAREDNESS**

Emergency Preparedness Items	Yes	No
Developed a Security Plan	73	84
Notified customers of security plans	36	121
Issued ID tags for drivers	73	84
Issue security labels for all baggage	27	131
Baggage and service areas kept locked	128	31
Installed plexi-glass to shield driver compartment	14	143
Installed phones in motorcoach	108	46
Installed cameras in motorcoach	12	144
Installed 2-way radios in motorcoach	76	80
Increased driver training on handling aggressive passengers	66	91
Increased driver training on awareness of surroundings and safety	111	46
Increased security equipment for garage	43	113
Checking baggage before loading	20	137
Security issues are a major concern	49	108

The nature of line-haul and charter or tour business may explain the disparity in the data. Security issues and measures appear to be far different to line-haul operators because of the unknown passenger construct. That is, it seems logical an unknown passenger, or unfamiliar one, would pose more of a threat from the driver's perspective, than a known one, or one whom the driver is able to establish a level of

rapport with during an extended excursion. The level of risk varies across groups of passengers. For example, groups of students and teachers or groups of senior citizen passengers pose far less of a concern than autonomous, non-group passengers.

Evidently, owner/operators have different mental models of policy demands in the post 9/11 political economy. In other words, due

to the radical and systemic scope of environmental change, there is a lot of ambiguity in this industry sector of how the regulatory and competitive components of the anticipated institutional change will eventually interact. These results indicate the need for trade associations to build collective representation of the anticipated institutional change in order to build a collective capacity to influence public policies.

Recently, the Over-the-Road Bus Security and Safety Act of 2001 (H.R. 3429) and a companion bill in the Senate, S. 1739, generated much discussion in the bus industry. This bill was the first ever designed to provide aid to the private bus industry. It seeks to establish a \$200 million competitive grant program administered by the Secretary of Transportation to upgrade security for buses, drivers, and facilities. The two major associations representing the motorcoach industry were at odds over this bill. The ABA was instrumental in the creation of the bill. However, the UMA was opposed to the financing source (Kane, 2002). The bill requires all commercial bus operators to pay 25 cents per passenger to fund the program. Secretary of Transportation Norman Y. Mineta could begin making grants after a year of collection.

In April 2002, the U.S. Senate Committee on Commerce, Science, and Transportation approved legislation that would provide \$400 million in security grants to private motorcoach operators. Under this bill, operators could apply for grants to help protect their drivers, implement passenger-screening programs, construct or modify existing terminals, train employees in threat

assessment, hire security officers, and install video surveillance and communications equipment (ABA, 2002). The House bill seeks \$600 million.

Strategic Responses

Several items captured strategic imperatives or initiatives in the survey. Strategic responses refer to long-term planning and intent vis-à-vis acquisitions, restructuring, and future markets in which to compete. Only 10 percent of our respondents were considering selling their business as a result of the events on September 11th (Table 7). Twenty-two firms, in fact, are considering expansion via buying out competitors. Only two firms were actively seeking a consolidator (e.g., one of the major three consolidators) to purchase their operations and assets, while nine firms indicate willingness to merge with another firm.

Greater than one-third, however, indicate their intention to restructure their operations as a result of the terrorist acts. Additionally, 54% have seen their tour business change, 60% have seen charter business change and nearly one-fourth have seen their bus operations change. This change in traditional operations necessitates a strategic response.

These results indicate that the owner/operator responses vary on the tactics-strategy continuum. Evidently, they perceive differentially how the relationship between institutional processes (i.e., cognitive beliefs about the power dynamics in the sector) and direct state actions (i.e., regulatory or coercive mechanisms) will eventually impact the competitive structure of their sector.

TABLE 7
STRATEGIC RESPONSES TO TERRORISM

Strategic Issue	Affirmative	Negative
Considering selling business	16	144
Considering purchasing competitor	22	138
Seeking consolidator to buy out	2	156
Considering restructuring	54	100
Changing school bus operations	36	114
Changing tour operations	86	73
Changing charter operations	96	63
Considering strategic merger	9	150

Perceived Overall Impact on the Motorcoach Industry

General perceptions of the impact of episodic events of terror and resultant strategies and policies on homeland security were also captured in the data. One hundred and eleven respondents indicated their belief that the terror acts have impacted the overall industry negatively (Table 8).

Many respondents (60%) indicate that many of their competitors have gone out of business (Table 9). Furthermore, competitive proximity seems to be expanding in response to the uncertainty and shakeup in the industry since September 11th, as 102 respondents specify their geographic market expanding as a result of the changes since September 11th. Ninety three respondents indicate their belief that the industry will improve by these changes.

In the three months following the terrorist attacks, most motorcoach carriers lost business (Table 10). While 13 respondents reported business revenue actually jumped in the three months following the attacks, most reported losses. Nearly 65% reported

losses for fourth quarter 2001 between \$5000 and \$100,000.

The central argument here is that during the short time period of the post 9/11 transformation of the political economy faced by this sector, the influences of institutional change vary in their impacts on owner/operators' cognitive model reflecting their future competitive posture.

FURTHER INTERPRETATION AND DISCUSSION

Interpreting these descriptive statistics leads to insight into an industry's response to terror, both in the short-term shore-up type activities and in long-term, strategic quests.

The research results indicate that, while many customers have been ordered not to travel, those that are traveling are demanding shorter trips and trips that are closer to home. It would appear that these clients are not intimidated by the terrorism, yet are cautious, staying closer to home in case the need arises to return quickly.

**TABLE 8
INDUSTRY HAS BEEN NEGATIVELY AFFECTED**

Overall [-] Affect?	YES	NO
	111	40

**TABLE 9
COMPETITIVE RESPONSE**

Competitive Items	Affirmative	Negative
Competitors have gone out of business	94	64
Competitors expanding proximity	102	54
Business will improve from changes in industry	93	60

**TABLE 10
LOST BUSINESS IN 4TH QUARTER, 2001**

\$ Revenue lost	Frequency	Percent	Cumulative %
<\$5000	17	11.5	11.5
\$5001 - \$20000	30	20.3	31.8
\$20001 - \$50000	35	23.6	55.4
\$50001 - \$100000	31	20.9	76.4
\$100001 - \$200000	6	4.1	80.4
>\$200000	16	10.8	91.2
Business increased	13	8.8	100.0

Similarly, demand for casino business seems to indicate that passengers are not canceling scheduled trips, rather reallocating their desired destinations.

Emergency preparedness has recently received attention in the public administration literature. Nearly half of the owner operators in the survey indicate that new

security plans had been developed in the wake of the September 11th terror attacks and their aftermath. This indicates a proactive approach to emergency preparation, rather than reactive strategies. Interestingly, a small fraction (22.9%) of the respondents actually communicate that strategy and emergency preparedness to customers. This represents an incredible

marketing opportunity, as relaying these efforts may decrease customer's dissonance and increase confidence in ridership.

Another opportunity for owner/operators to relieve fear of travel would be to implement tagging procedures, an activity only 17 % of the sample has adopted. Further, the half of the sample that has not yet issued identification tags for their drivers may be wise to do so.

It appears other actions toward emergency preparedness (e.g., installation of plexiglass, installation of phones, two-way radios, cameras and other communications equipment) is a step in the right direction toward safety and emergency preparation. Driver training (for greater awareness of passengers and surroundings) is another step in emergency preparation hailed by this industry. Though the handling of aggressive passengers is nondescript, it appears that greater training and preparation would be in order.

Strategic responses were also captured in the research. Only 16 firms reported their intent to sell given the aftermath of terrorism on the industry. More likely to be seen is not a restructuring of the industry on a macro level, but rather strategic restructuring of individual firms within the industry. Of the three major segments (e.g., charter, tour, and school), the greatest impact was seen in charter operations. This indicates that strategic initiatives in the industry in the short-term to mid-term will likely involve segmentation initiatives.

By a 3-to-2 margin, respondents reported that direct competitors have gone out of business as a result of 9/11. It seems far more likely that a motor carrier will see competitive pressure from motorcoach carriers from further and further away from its base

operation than to see those carriers go out of business. Nevertheless, carriers must concentrate on shoring up their own business by offering closer-to-home and more frequent excursions.

While a vast majority of the sample respondents reported lost revenue (only 13 of 163 reported increased revenues), the lasting effect is uncertain. Is this lost revenue canceled business or merely postponed business? It could prove insightful to determine the answer. Clearly, the business that was education related was canceled entirely, as service-oriented business is time-dependent. In other words, if that business was scheduled for a particular date, then canceled, it is a lost opportunity and is non-recoverable (academic years and athletic seasons conclude). Knowing the answer may also determine a true recovery from pent-up demand recoverable only in the very short-term.

In summary, the requirements of homeland security imply changes not only in the political economy/institutional environment but also in numerous aspects affecting the functioning of the owner/operator segment of the motorcoach industry. As these changes are profound and systemic in nature, they demand new policy and operational and strategic responses by owner/operators and their trade associations. Specifically, although the changes in the regulatory environment are revolutionary and those in the competitive environment are evolutionary, the effects of the former lag behind those of the latter (see Figure 1). Therefore, owner/operators in the motorcoach industry need to make individualized, yet concerted dynamic and credible commitments to policies and strategies in the new "punctuated" institutional environment that they face. The dynamics and the extent of these commitments will vary across owner/

operator firms in terms of the trade-offs that they individually make within their functional and cognitive models of the sector and its environmental change.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

While insights were obtained into an industry's response to terrorism, the research is by no means definitive. While data analysis was initially limited to dichotomous right-hand-side variables, this was a conscious set of tradeoffs due to the delicate nature of the topic, lack of public data available from the unit of interest, and the salient role the industry's association (i.e., the UMA) played in articulating a collective response to the new environment. Further, previous research (Arimond and ElFessi 2001) determined that very few market surveys are used in tourism-related studies as Likert-type scales are perceived as too tedious and demanding for the respondent and are less likely to capture the respondents' intent than a smaller dichotomous quantitative scale (Mazenac 1984, Cheung 1994).

Importantly, the UMA and ABA provided access to the population sample frame of interest. Collectively, these associations wanted to capture responses and intentions, and were not interested in their members' perceptions (e.g., psychometric captured by a likert scaled instrument), but rather in firm behavior. In sum, the associations wanted to capture collective action.

While the sample captured 163 robust responses, as in all survey research (Anderson, 1985) it is possible that those responding are quite different from non-respondents. The data are further limited in that it was collected from different members

at two locations, but a second wave of questionnaires was not viable. Thus, comparing latter respondents to early respondents was infeasible.

Another limitation is that only those owner operators attending one of two major conferences were included in the sample frame. Perhaps those owner/operators not attending could offer very different insights into strategic and competitive responses to terrorism.

Several future research streams seem viable and ought to be pursued. First, this research sought answers from a single sector of transportation and cannot be confidently generalized across all sectors of transportation. However, seeing if other sectors responded similarly may offer insight into how service providers respond strategically to such situations.

Future research should seek to discover whether there exist any significant clusters in the data. Cluster analysis might identify segments with varying tactics and strategies in response to terrorism. If these clusters can be identified, then a normative model might then be produced.

Moreover, combining clustering analysis with other methodological techniques as suggested by Kechem and Shook (1995) might reveal valuable insight. One significant step is to analyze the clusters in an attempt to determine specific similarities and differences among companies in their post-9/11 responses.

Further theories should be examined to determine whether an industry left to fend for itself without governmental intervention can absorb the cost and respond with collective action regarding homeland security.

CONCLUSION

This research makes a significant contribution to the emerging arena of homeland security and the impact of change of this type on the firms operating and competing in the U.S. motorcoach industry. Unlike emergency preparedness, which is a firm's proactive approach to the threat of episodic terror events and often mandated through regulatory intervention, homeland security is a systemic construct and transpires when the rules of the game change.

Environmental change was modeled in a transportation and tourism sector based on the political economy framework. This framework seems to support well the design of this empirical study intended to capture

the collective response to the changing environment of the motorcoach industry post-9/11. Several descriptive statistics were analyzed and explained. Future directions for greater understanding were then offered.

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Journal of Transportation Management

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MANUSCRIPT SAMPLE

TEACHING LOGISTICS STUDENTS TO TAKE OWNERSHIP OF INFORMATION INFRASTRUCTURE DEVELOPMENT

Frank W. Davis, University of Tennessee
Kenneth J. Preissler, Logistics Insights Corporation

Logistics systems, developed gradually over the past decades, are undergoing necessary radical change in this era of increasing global competition. This article describes an approach taken by the authors to teach logistics students how to take ownership of designing their own information infrastructure and how to use it to make their organizations more flexible, providing more strategic options.

INTRODUCTION

Advances in information systems technology such as data base management systems, bar code scanning, telecommunications, and image processing have enabled logistics and information managers with vision to reengineer the way the firm conducts its business. The usage of mainframe computers, personal computers, and logistics information systems has been widely studied (Gustin 1989). These studies have universally concluded that there has been a rapid growth in the usage of computers and logistics information systems.

Computer Usage in the Classroom

The usage of computer applications in a logistics course has also been studied. Rao, Stenger and Wu stated that there are several approaches to integrating computers into the classroom in a business curriculum, each with its individual advantages and drawbacks (1992).

Table 1 about here

Systems Development in Practice

The study of the information systems development process of computer applications has been almost universally left up to the computer science, software engineering, and information systems educators and practitioners.

$$y = a^2 - 2ax + x^2 \tag{1}$$

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