Final Report: Commercial Fleet Management Project

Submitted by

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January 1998

Acknowledgements

The authors thank NOVA Group, Ltd. for sponsoring this project to evaluate the effect of a new information technology on commercial fleet management and, in particular, Jerri Brown, President and Roger MacArthur, General Manager for their extensive time and assistance. Without their commitment to the research this project would have fallen far short of the goal to measure the effects of an Intelligent Transportation System technology on business productivity and, therefore, competiveness. We gratefully thank The Research Center of Excellence in Intelligent Transportation Systems and the Transportation Center at Virginia Polytechnical University for the support that made it possible to conduct the research that is reported here.

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I. Executive Summary

Interest in the effects on businesses that have implemented Intelligent Transportation System (ITS) technologies has been growing. And, as the federal and state governments have begun to realize. without proof of the advantages inherent in these technologies transportation companies have been reluctant to acquire them. In response to this interest, the Center for Transportation and Land Policy in The Institute of Public Policy at George Mason University designed a project to measure the effects of an ITS technology shortly after it had been developed and implemented by a courier company. The project was funded by the U.S Department of Transportation, Federal Highway Administration and sponsored by NOVA Group, Ltd. The report of the study details the effectiveness of the technology and the software development process.

NOVA Group, Ltd. (NOVA), a diversified transportation company and developer of a dispatching software, *Dispatch* Tools™, the subject of the study, had searched for several years for a software product that could fulfill the unique real-time, demand-responsive, routing requirements of the courier industry. Having determined that the requisite software was not available, NOVA began development of *Dispatch*Tools™ in 1996 and began implementation in its courier company, NOVA Delivery, in July of 1997.

After considering several factors that could measure the effectiveness of *Dispatch*Tools™, the research team chose productivity of drivers as measured by the number of deliveries per driver-hour, because it would be impacted least by uncontrollable factors such as changes in the customer base and costs of operations. Data was collected for the same three month periods in 1996 before implementation and in 1997 after implementation. The same drivers and dispatchers participated in both years. The change in productivity of these drivers after implementation of the dispatching software averaged 24%. An ancillary effect that was not anticipated, and thus not measured, was the observable decrease in stress on the dispatchers and improved communications between dispatchers and office personnel.

The report includes descriptions of the development process, the software product, and the methodology devised to measure the productivity factor and the results of surveying drivers and dispatchers before and after implementation.

II. Introduction

The United States has allocated over $100 million annually in federal funds to the development of Intelligent Transportation Systems (ITS). (Kanninen 1996, 1) Further, "ITS combines high technology and improvements in information systems, communication, sensors, and advanced mathematical methods with the conventional world of surface transportation infrastructure. " (Sussman 1995, 115) One area of interest in ITS research is centered on commercial vehicle operations (CVO). Typical commercial transportation companies such as trucking, courier and taxi firms have adopted ITS technologies in an effort to enhance productivity and increase their profits. (Sussman 1995, 118-l19) In addition to businesses, many police departments across the country are beginning to use ITS technologies, in particular, advanced, state-of-the-art dispatching systems. While among businesses and public institutions there is considerable interest in these technologies, few, if any, evaluations of the effect of ITS technologies on productivity, efficiency, revenues, etc. have been reported.

Given the growing importance of ITS to the transportation industry and governments, and the level of federal funding for ITS research, an investigation of the impact of an ITS technology on a commercial fleet operation is timely. With the assistance of NOVA Group, Ltd. (NOVA), a diversified transportation company, and its courier company, NOVA Delivery, a study was designed to quantify the changes in productivity of company drivers attributable to the implementation of the company's proprietary software *Dispatch*Tools™. [1]

The study was designed to investigate three aspects of this ITS technology:

* A case study of the challenges, anticipated benefits, and actual benefits within a courier company from the development and implementation of a dispatching software;

* Quantification and analysis of any productivity benefits gained by implementing the software; and

* Analysis of any attitudinal changes on the part of drivers and dispatchers resulting from the company's adoption of this ITS technology.

[1] *Dispatch*Tools™ is a registered trademark of NOVA

III. Case Study

Profile of NOVA Group, Ltd.

Headquartered in northern Virginia, NOVA is involved primarily in freight and courier operations mainly in the Baltimore-Washington metropolitan area, and on a limited basis in the Richmond and Tidewater Regions of Virginia. Additionally, NOVA provides shuttle-bus connections between the Washington Metropolitan Transit Authority's subway system and several communities in Fairfax County, VA. And, in certain situations NOVA pays other courier companies to make deliveries outside its normal operating area, thereby effectively extending its business throughout the United States.

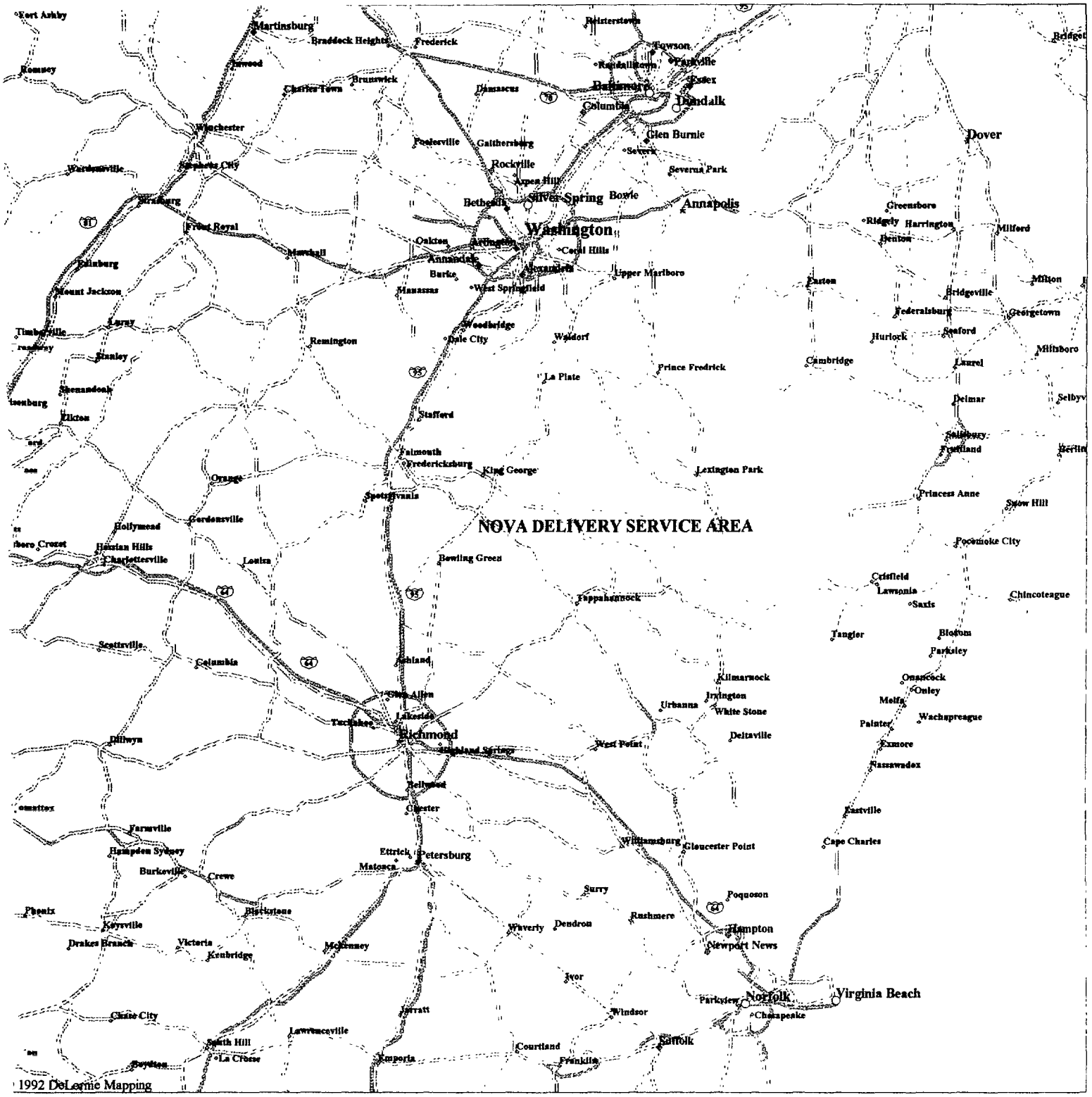
As of December 1996 NOVA employed about 140 drivers and dispatchers. Approximately 70 percent of the drivers were independent contractors who handled most of the unscheduled demand jobs, while the remaining 30 percent were company employees who handled both demand and scheduled work. The company's employed drivers usually were paid according to the number of hours that they worked. Some, however, were paid according to a combination of the hours worked and the number of deliveries they made. Contract drivers were paid between 50 and 60 percent of the delivery charge, thus labor accounted for more than 50 percent of the cost of making deliveries.

The drivers who participated in this productivity study were company employees paid on an hourly rate basis; consequently, their remuneration was based on time spent on the job rather than the number of deliveries they made. From this group of company-employed drivers fourteen were selected for this study. The selection was based on NOVA's expectation that these drivers would remain employed for the duration of the study. It was within this company-employed group of drivers that NOVA management hoped for at least a 10 - 15% improvement in productivity, as defined by deliveries per driver-hour, resulting from utilization of the software, *Dispatch*Tools™.

NOVA offers the following delivery services: 1) priority, 2) regular, and 3) bargain. These services are explained in Attachment A [Copy of NOVA Delivery's Rate Sheet]. Pick-up and delivery operations are subject to the demands of the company's customers which require frequent changes in drivers' orders and schedules.

In addition to its regular services, NOVA provides special services for companies located at Washington Dulles International Airport (WDIA) and one of the nation's largest banks. NOVA's business at WDIA is a ground-to-air-to-ground freight operation that usually is

(GAD)



LEGEND

- City
- National capitol
- State capitol
- Small town
- Large town
- Interstate route
- State boundary
- Ferry
- Interstate highway
- State highway
- U.S. highway
- River
- Island
- Open water

Scale 1:1,600,000 (at center)

20 Miles

50 KM

Mag 9.00
Wed Jan 14 11:05:20 1998

demand driven. Number of the drivers involved in the productivity and attitudinal studies were assigned to WDIA routes. For the large bank NOVA provides pick-up and delivery services every day and once on weekends from the DC area to Richmond. Routes to Richmond are usually handled by company employees, however, of the group of drivers selected for this study, only one had a regular Fairfax, VA to Richmond, VA run.

Development of the Dispatching System: *Dispatch*Tools™

Background

To better serve its customers, increase productivity and position the company for expansion, NOVA decided in 1994 to invest in the development of software specifically designed to handle the unique demands of the courier industry's dispatching operations. Prior to making this decision NOVA had determined that there was no software available that could meet its specifications.

Prior to the implementation of *Dispatch*Tools™ NOVA was using a system that was very labor intensive for dispatchers. Although the information regarding pick-ups and deliveries was keyed into an order-entry computer program, it was printed out on tickets [See Attachment B: Sample Ticket] which the dispatchers had to sort and group manually before assigning jobs. The dispatchers' computer screens displayed the jobs that were currently active but there was no map or text to show driver locations. Dispatchers had to remember the approximate locations and destinations assigned to as many as 30 drivers at one time. Communication between drivers and dispatchers was via alpha-numeric pagers and cell phones. At times the dispatching center was loud and chaotic, as dispatchers communicated with each other and customer-service personnel.

Anticipated Benefits

Interviews with NOVA management prior to the implementation of *Dispatch* Tools™ revealed that its plan to expand its customer base was dependant on improvements in its dispatching operation. The company expected its new software to improve dispatching in several ways:

* Dispatchers would be able to handle a larger volume of work with improved accuracy (The memory requirements and labor-intensive aspects of dispatchers' work create the potential for considerable error, a very stressful work environment, and limit the number of drivers that a dispatcher can handle.);

* Dispatchers would spend less time communicating with drivers, (With the click of a mouse, messages would be sent through a modem to a driver's pager and the number of keystrokes needed to send a message would be reduced because common messages, such as "Call the office," would be programmed in the system and transmitted by clicking the mouse .);

* Record keeping would be improved and report generation facilitated;

* Customer service would improve because the software's operational procedures would ensure better accountability. (For example, the system would indicate by a signature that a customer had received a delivery);

* Barring traffic and weather conditions, business would be more predictable, because pending jobs and general locations of drivers as shown on the dispatchers' screens would enable them to make better judgments about driver assignments; and,

* NOVA would be able to better manage the time of company-employed drivers, thereby increasing their productivity ratios. (The majority of these drivers have scheduled routes which can vary significantly from day-to-day, thus making it impossible for a dispatcher to memorize each driver's route.)

Actual Benefits

Dispatch*Tools*™ has enabled NOVA to achieve all of the anticipated benefits described above. Improvements in the efficiency of the dispatching operation was evidenced by the changes in the productivity of the drivers which has risen by a remarkable 24 % .

It should be noted that, although the evidence was anecdotal, NOVA management and the research team observed a significant decrease in the stress levels of dispatchers. There was a reduction in stress-related illnesses and a decrease in the consumption of aspirin to relieve headaches. This change occurred even though some stress was invoked by dispatchers having to convert from keystrokes to a mouse. The stress-reduction factor was important because NOVA had experienced the deaths of three of ten dispatchers (aged 40-50) from stress-related heart illnesses in a recent three-year period.

measurable?

In addition to lower aspirin consumption, NOVA management has observed that the dispatching operation has become much quieter - less screaming among dispatchers during difficult situations, and less acrimonious communication between customer-service personnel and dispatchers. All of these factors indicate that *Dispatch*Tools™ has enabled

NOVA to provide a less stressful work environment for both its dispatchers and office staff. Had these human-factors elements been anticipated, a plan to quantify changes could have been designed. But, even NOVA management had not anticipated this ancillary benefit.

Challenges in the Development Process

During the process of developing *Dispatch*Tools™, several problems arose which at times challenged the faith of NOVA's management staff; the most trying of these was the tension between the lead programmer and the dispatchers (the end users). The programmer's vision did not always resonate with the dispatchers who demanded modifications to make the software more user (dispatcher) friendly. Never having been a dispatcher, the programmer had difficulty understanding the desirability or necessity of the modifications. NOVA's president and the company's general manager, on the other hand, understood what the dispatchers wanted. The dispatchers ultimately Prevailed, While this interaction between the users and the programmer affected the software development schedule, NOVA believes that *Dispatch*Tools™ is a better product because of the interaction that occurred throughout the development process.

The major steps in the development of *Dispatch*Tools™ can be summarized as:

1. Development of the communication interfaces between the dispatchers and drivers, including pagers and future links to mobile data terminals (MDTs);

2. Synchronization of the order-entry system, CODA2000[2] and *Dispatch*Tools™ software with multiple computer stations in the dispatching center;

3. The development, testing and modification of functions in the *Dispatch*Tools™ system; and,

4. Data security; preventing the loss of data in the event of a system malfunction

By the end of 1996 approximately 20,000 lines of code had been written, the basic screen displays and layouts had been developed, and NOVA began extensive testing of the prototype. For six months, using simulated and controlled data, NOVA's dispatchers, technicians and management detected bugs and continued to work with the

[2] CODA2000 is a trademark of TransNet Corporation, a company based in Silver Spring, MD.

programmer on functionality and the requisite interfaces with the order-entry system to enable simultaneous transmission of data and communication with pagers and MDTs.

Synchronizing the order-entry system with *Dispatch*Tools™ was imperative, because it enabled a direct link between the order-entry functions and the dispatching operation thereby automating and synchronizing the following functions:

* clocking drivers in and out,
* listing available drivers,
* grouping drivers and jobs by various categories,
* assigning drivers to specific jobs,
* transmitting data to the drivers' alpha-pagers and acknowledging receipt of same,
* holding a driver in abeyance or assigning one of his jobs to another driver
* indicating that a driver has actually picked up or delivered a specific job, and
* verifying a delivery by recording a recipient's signature.

While the trials and tribulations NOVA experienced in the software development process were of some interest, this study was concerned mainly with evaluating the impact the software might have on the efficiency of the dispatching operation and identifying any changes in the productivity of the drivers. Suffice it to say that, as in all cases, NOVA found that software development and integration is a difficult business. Nevertheless, the problems that arose during the development process were solved and full implementation began in July 1997.

IV. Description of the *Dispatch*Tools™ System

*Dispatch*Tools™ operates on its own Microsoft Windows 95™ based, stand alone PC network with a server that links the dispatchers' computer screens and the dispatching operation to the order-entry software. It can operate on any Pentium™ class computer with either a Windows 3. 1™ or Windows 95™ operating system. *Dispatch*Tools™ uses a library of advanced routing and decision-making algorithms to assist dispatchers in managing a large volume of time-sensitive delivery orders. A map database supplied by Navigation Technologies (NavTech) [See Attachment C: NavTech Map . . .] and a route optimization software *PowerSteering*™,[3] developed by NOVA in 1996 have enabled formation of 50 geographic zones for determining times, distances and preferred routings. The software has a colorful display in a Windows format. [See Attachment C]

[3] *PowerSteering*™ is a trademark of NOVA Group, Ltd.

Some of the software's interesting features include multiple sorting options for viewing pending jobs and/or jobs in progress with various levels of detail; sorting options for viewing driver locations and their routes; testing the impact and thus the desirability of reassigning a driver; and features that enable dispatchers to select the best route and driver to effect a rapid response to a customer's demand.

Unlike NOVA's former dispatching protocol, *Dispatch*Tools™ is designed to be ticketless. Jobs are organized by the zone in which they originate or for which they are destined. Deliveries are categorized as pending jobs or jobs in progress. With the click of a button these categories can be viewed separately. Dispatchers are able to sort, group and assign jobs to drivers and send updated delivery information to the order-entry system by manipulating the information on their screens. Although NOVA's order-entry system is UNIX based, it has been reconfigured to be fully compatible and synchronized with *Dispatch*Tools™.

When NOVA introduces mobile data terminals in its vehicles, which it intends to do early in 1998, drivers will be able to communicate with their home base without human intervention. Acknowledgment of the assignment of a job, the time of pick-up, the time of drop, and the receiver's signature at time of drop will be transmitted directly back to one of the computers in the dispatching center. Since their computers are networked, this information will be shared immediately among the dispatchers. The mobile data terminals will enable NOVA to assign the two people in the dispatching center currently responsible for communicating directly with the drivers via pagers and cell phones to other tasks.

V. Methodology

Following several consultations with NOVA management about the parameters of this study, availability of data and the variables that could and could not be controlled, a pure productivity factor, deliveries oer driver-hour, was selected as the primary, quantifiable evaluation measurement. Factors other than productivity of drivers such as net revenue gains and/or losses and dispatches per hour were considered, and subsequently rejected. Extraneous elements could affect revenues and NOVA did not keep records of its dispatchers productivity. Of the available choices, driver productivity was believed to be impacted the least by changes in the company's customer base and/or operational costs. The number of deliveries that a driver makes over time would not depend on changes in the size of NOVA's customer base. However, a driver's productivity factor could be affected by changes in prescheduled routes that could cause longer driving distances. This would decrease the number of deliveries made in a day. That was the case with three drivers whose productivity actually went down due to

changes in their prescheduled routes which caused them to drive greater distances thus increasing the time it took to make deliveries.

The productivity approach has "intuitive appeal" and allows the measurement of work-hours which is easier to measure than capital or other inputs (U.S. Department of Transportation, 119). Furthermore, as noted above, labor is the dominant input, in the delivery business. Because the study would be conducted in a business environment where control groups could not be established, a one-group, pretest-posttest design was selected to measure changes in productivity. With this design, baseline data was gathered prior to the adoption of the technology. Next, an event affecting the group, in this case the adoption of *Dispatch*Tools™, occurred and finally, data was gathered to measure the effect of the event. (Campbell and Stanley 1963, 7-8)

The before-after design adopted for this study is far from ideal in that it presents several validity concerns Campbell and Stanley (and many others after their seminal work on the topic) divide the factors jeopardizing validity into external and internal sources. Internal validity addresses the question of whether the experimental treatment in fact made a difference in the specific instance under study. External validity is concerned with the generalizability of any findings, i.e. , to what settings, populations, treatments, etc. Of the 8 threats to internal validity (history, maturation, testing, instrumentation, statistical regression, selection bias, experimental mortality and selection-maturation interaction) history, selection bias and testing are probably the most suspect threats to internal validity in this study. Detailed information regarding decisions made to reduce the potential effects of history and selection of subjects is presented below in an effort to either address these potential threats, or in the case of subject selection, to explain the nature of the bias. While pilot testing may have had some impact on subjects' before and after attitude responses, there is little reason to believe that the effect was large if it occurred at all. Finally, the critical experimental effect variable in this study is employee productivity and this is a factual observable measure. While it is possible that history, i.e., some other event(s) occurring between the pre and post-test periods, could be responsible for changes in productivity, a significant effort was made to control or eliminate potentially large non-experimental events or policy changes that might have impacted productivity. These efforts are described below.

There are two basic threats to external validity. These are the reactive or interactive effect of testing on the subjects and the interaction effects of selection biases and the experimental variable. While these are possible threats to external validity, the fact that the experimental variable (productivity) does not depend on subject judgements suggests that the threat is minimal.

Measuring changes in NOVA's net revenues was among several factors that the research team considered prior to deciding on productivity. But, there were too many factors impacting revenues that could not be controlled, such as changes in the customer base and operating costs. NOVA could not afford to delay opportunities to acquire additional business. However, it did agree not to introduce operational changes that would have affected productivity, such as equipping the fleet with MDTs, until after this study was completed.

Additionally, attitudinal surveys of the 14 drivers and 7 dispatchers who participated in the study were conducted prior to the introduction of the software and after it had been in use for four months.

VI. Data Collection and Analysis

Data on driver-hours and deliveries was retrieved from NOVA's databases. While NOVA Delivery stores most of its data electronically, some is stored as hard copy. For this study, its personnel-payroll database containing the number of hours that each driver worked and one of the order-entry system's databases containing delivery information were the sources of the raw numbers derived for the requisite calculations.

In attempting to gather the data the research team discovered that the delivery data was not readily accessible because NOVA uses control numbers to track its business. In this study a delivery is defined as a courier transporting an item from point A to point B. However, in NOVA's system a control number can represent several entirely different items. For example, it can represent five pick-ups and 1 drop, 1 pick-up and multiple drops, or 1 pick-up and 1 drop; or it can represent instructions to a driver which may or may not relate to a job. It became necessary to collect the data manually in order to make adjustments for round-trips and split deliveries. A template was designed to facilitate recording the data and adjustments. [See Attachment D: Delivery Data] Nevertheless, it was a time-consuming exercise for both the research assistant and NOVA's general manager who retrieved the data.

VII. Attitudinal Study

Four survey instruments were designed and used in an assessment of driver and dispatcher perceptions before and after implementation of *Dispatch*Tools™. The pre-implementation surveys asked drivers about how traffic information is communicated and

how the process might be improved. The post-implementation surveys focused on how *Dispatch*Tools™ affected their work. [See Attachment E: Survey Instruments]

In February and March of 1997, seven dispatchers were interviewed in person and fourteen drivers were interviewed either in person or by phone. Both groups were asked about the current state of NOVA's traffic communication system. At the request of NOVA management the post-implementation survey forms were completed by the dispatchers and drivers without an interviewer present.

Dispatcher Survey Before Implementation

All of the dispatchers interviewed were males who had worked at dispatching for NOVA for two or more years. Most were middle-aged.

All of the dispatchers received traffic information informally from other dispatchers or drivers. A majority of the dispatchers (5 of 7) said that they communicated with drivers using two-way radios. A narrower majority (4 of 7) of dispatchers stated that they communicated verbally among themselves. Unusual congestion and tie-ups were sometimes communicated to dispatchers by drivers, but this did not appear to be a very dependable means of communicating traffic information. No one had any suggestion as to how to get drivers to consistently relay traffic information to the dispatching center.

Four of seven dispatchers did not think that they would have time to give specific directions using route optimization to every driver who needed them. Five of seven dispatchers thought that drivers would follow the directions, if given, while the two remaining respondents did not think that every driver would pay attention to a dispatcher's directions.

Six dispatchers said that they communicated with drivers by the paging system or two-way radio, while five said they also used regular phones. All dispatchers said that they shared information by talking to each other. Six dispatchers said that they used two-way radios and five said they used the paging system to alert drivers and other dispatchers about delays. Three of seven dispatchers said that they handle information about traffic delays by suggesting an alternative route.

Driver Survey Before Implementation

The drivers were almost evenly divided on whether they get traffic information from dispatchers or other drivers. Two-way radio was the dominant means of getting

traffic information from dispatchers and this occurred in an informal and nonsystematic manner.

In response to the question, "How do you communicate with dispatchers and other drivers?" twelve of the fourteen drivers said they use two-way radios. Six of fourteen respondents said that they communicated with other drivers by two-way radio.

A large majority of drivers said that they alert dispatchers of delays by two-way radio. 50% of the drivers said that they alert their fellow drivers by two-way radio. Most drivers said they respond to information about delays by choosing an alternative route.

All drivers had pagers in their delivery vehicles, and all but one had a two-way radio. A majority of drivers listened to commercial radio for traffic reports.

A large majority of drivers using two-way radios said that these devices were helpful for avoiding traffic congestion. 50% of the drivers using pagers said that these devices were helpful for avoiding traffic congestion, but slightly less than half do not consider them particularly helpful. Among the four drivers using cellular phones by choice, two believe these devices are helpful for avoiding traffic congestion, while the other two were neutral as to their effectiveness for avoiding congestion.

The most frequently offered response to what dispatchers could do to provide better traffic information was "nothing."

The drivers split almost evenly as to whether dispatchers providing exact routes for the drivers would improve the work of drivers. Eight of fourteen said that they would use these routes, but four of fourteen indicated they would not, because they rely on their ability to navigate the region without dispatcher assistance.

In summary: All dispatchers shared information by talking to each other; their methods of communicating with drivers varied and there was no protocol for passing on information about congestion. Drivers relied on commercial radio for traffic information and where possible took other routes to avoid delays. All of the dispatchers and most of the drivers believed that drivers would use alternative routing information to avoid congestion if it were provided. A variety of suggestions were offered as to how the communication system could be unproved, but there was no consensus.

Driver Survey After Implementation

All 14 of the drivers participating in this study said that avoiding congestion was

no easier after implementation of *Dispatch*Tools(TM) than before, even though a large majority (11) said they were getting more timely information from dispatchers than before. Since in the pre-implementation survey drivers indicated that they did not expect dispatchers to give them information to avoid congestion, their answers to this question may reflect their belief that dispatchers could not help them avoid congestion. None of the drivers have changed their method of informing other drivers about congestion and delays (they continue to use two-way radios to inform other drivers). Seven of the drivers knew they were making more deliveries per hour, while the other seven were unsure. The drivers were unable to make a judgement as to the value to them of *Dispatch*Tools(TM).

Dispatcher Survey After Implementation

The majority (4 of 6) of the dispatchers said that communication with drivers has improved somewhat, but none have found that information about traffic conditions has improved. None of the dispatchers saw any negative effects on communication with drivers. All dispatchers have changed their method of informing drivers about delays and are now using the new paging program. All but one of the dispatchers said that the new software has been good for them; in particular, the multiple grouping and sorting options, better tracking of the fleet and better communication with each other were the most significant benefits to them. Learning to use the mouse, the major hurdle in learning to use the software, was their biggest complaint. The dispatchers were aware of the improvements in the dispatching operation; drivers were not really sure about the benefits, probably because they do not see the dispatching center in operation.

VIII. Conclusions

This study has revealed two significant factors about the effects a proprietary software had on the courier company that developed and implemented the software:

* The overall average increase in productivity of company drivers was 24%, and

* The stress on dispatchers was reduced.

Both factors are improvements that should have a positive effect on the bottom line of any transportation company that chooses to implement an ITS decision-support system to improve the efficiency and effectiveness of its dispatching operation.

Changes in productivity were measured during the first three months of operation with the new software, while the dispatchers were still learning to use it. Nevertheless, even

though the productivity of three drivers actually went down, the extraordinarily high increases for several others offset the negative numbers. NOVA management explained that the decreases in productivity of the three drivers were due to changes in routings which gave them long runs such as those going to Richmond and Baltimore. (Although these runs tend to be revenue losers, NOVA maintains them for customer relations and marketing purposes .)

Although the research team did not directly measure changes in the efficiency of the dispatching operation, in reality, increases in driver productivity are due to improvements m dispatcher efficiency. A measurement such as the number of dispatches per hour was considered to determine changes in efficiency, but, since NOVA does not collect data on the efficiency of its dispatchers, the research team decided to concentrate on effectiveness which could be measured in terms of driver productivity. The largest number of deliveries that can be made in a day or month by the smallest number of couriers is, ultimately, a major factor in determining profitability.

The surveys confirmed that neither the dispatchers nor the drivers found the software helpful in avoiding congestion. In some cases this is because there are no alternative routes, in others because drivers are already caught in the delay before they get the information, etc. NOVA might find that subscribing to a variety of traffic information services combined with better internal procedures for disseminating this information would improve the ability of drivers to avoid congested routes. The Washington Regional SmarTraveler program would be helpful in providing more timely congestion-related information. This program is designed to eventually establish a region-wide cross-jurisdictional integrated traffic information system providing continuously updated information on traffic conditions via telephone and over the internet.

Once *Dispatch*Tools™ has been implemented across the entire fleet, NOVA should experience a significant overall gain in productivity. And, as the dispatchers become proficient with the software, the efficiency of the dispatching operation should improve thus enhancing the probability of productivity improvements. Additionally, NOVA will be able to expand its business; by increasing its customer base and by introducing a new service which it could not do until *Dispatch*Tools™ was implemented. And, the company should be able to handle a larger volume of business with either the same or possibly fewer dispatchers.

All of the benefits that NOVA anticipated have been realized and the functionality requirements listed on page 7 were developed according to NOVA's development plan. To a large extent these accomplishments were due to the intense involvement of NOVA management and dispatchers with the programmer as *Dispatch*Tools™ was being developed.

With respect to the significance of NOVA's results, it can be said that improved efficiencies in the courier industry could reduce air pollution and gasoline consumption in that it is theoretically possible to reduce vehicle-miles-of-travel (vmt) with dispatching and routing software, especially when combined with an effective method for communicating traffic information such as MDTs. It is estimated that couriers in the DC metropolitan region drive over 600,000 miles per day, so any mechanism for reducing their vmt would help reduce air pollution. At the same time it would be naive to assume that couriers would always take the routes assigned to them. GPS technology could be helpful in this situation, because it would give dispatchers certain knowledge of a vehicle locations, thereby improving their options for making logical routing and dispatching decisions.

Have the benefits been worth the costs? NOVA believed it had no choice but to develop *Dispatch*Tools(™), if it wanted to remain competitive. The company's out-dated technology had precluded any opportunity for expansion and, while the impact of FAX transmissions on the delivery business had been largely overcome, NOVA anticipated some eroison of its business as a result of e-mail, the inter-net and the growing acceptance of FAX'd signatures for legal transactions. However, package deliveries could increase as customers do more shopping on the internet. This kind of business loss and recovery is common in the courier industry and courier companies especially have to be positioned to take advantage of changes as they occur. In any event, *Dispatch*Tools™ will allow NOVA to expand its courier services and possibly open a market for sales of the software.

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X. Glossary

Alpha-Numeric Pagers: These devices only receive text or numeric messages. NOVA is currently using them.

Customer Service Representative (CSR): A person who answers the phone and enters job information into the computer.

DispatchTools(TM): NOVA's proprietary dispatching software

CODA2000: A UNIX based order-entry system designed specifically for the courier industry to enter job orders and invoices, to pay the driver, and to maintain records. A Windows version is in development.

Global Positioning System (GPS): A system that uses satellites to locate and relay information about a vehicle's location. It can also be used to transmit information back to the vehicle or elsewhere.

Mainframe: A very large, extremely expensive, and generally proprietary computer for heavy-duty usage in institutions, universities, banks, large corporations, etc.

Mobile Data Terminal (MDT): This device provides two-way data communication. Usage is common among many taxicab companies, UPS, FedEx., etc.

Proof of Delivery (POD): Refers to the time and signature when a job has actually been delivered.

PX: A software module of Sonet Corporation; currently in use by NOVA

UNM: A multi-tasking, multi-user computer operating system

Windows 95: An operating system developed by Microsoft

Attachment A

NOVA Delivery's Rate Sheet

Rates & Services from:
Zone 61 - Downtown

ZONE	PRICE	VIRGINIA
1	11.50	Pentagon/Crystal City/DCA
2	11.00	NE Arlington/Rosslyn
3	12.00	NW Arl/Lee & Glebe
4	12.00	W. Alex/Shirlington
5	12.50	East Alex/Old Town
6	13.00	Falls Church/Merrifield
7	13.00	Annandale
8	13.00	Falls Church/Merrifield
9	12.00	McLean
10	13.00	Tysons Corner
11	23.50	Centreville
12	19.00	Reston
13	15.00	Vienna
14	16.00	Fairfax
15	17.00	Burke
16	16.50	Mt. Vernon
17	21.50	Lorton/Ft Belvoir
18	21.50	Dulles Airport/Herndon
19	19.00	Fairlakes
20	22.50	Chantilly
21	26.00	Sterling
22	26.00	Great Falls

ZONE	PRICE	MARYLAND
30	15.00	Bethesda/Chevy Chase
31	15.50	Silver Spring
32	16.00	Wheaton/Kensington
33	17.00	Rockville
34	19.50	Gaithersburg
35	19.50	Potomac
36	22.50	Western Montgomery County
37	26.00	Northern Montgomery County
38	26.00	Eastern Montgomery County
39	20.00	Laurel/Beltsville/Greenbelt Northern PG County
40	14.50	Coll. Pk/Riverdale/Hyattsville
41	20.00	NASA/Bowie/Lanham
42	15.50	US Air Arena
43	20.00	Largo/Upper Marlboro/E. Central PG
44	15.50	Suitland
45	19 50	Andrews AFB/Clinton/Rosecroft
46	23 00	SE PG County

ZONE	PRICE	WASHINGTON
60	8.50	Capitol Hill
61	7.00	Downtown
62	8.50	Georgetown
63	10.00	Mid NW DC
64	10.50	NE DC
65	11.50	SE DC

OUTLYING AREAS

34.00	Leesburg
35.50	Manassas
33.50	Woodbridge
51.00	South Baltimore
66.00	West Baltimore
71.00	East Baltimore
81.00	North Baltimore
43.00	Anne Arundel East
38.00	Anne Arundel West
44.00	Howard County North
41.00	Howard County South
112.50	Richmond
62.50	Fredericksburg

[ ] SERVICES

REGULAR - DOOR TO DOOR SERVICE WITHIN 2-3 HOURS. CHARGED AT THE RATES CONTAINED ABOVE.

PRIORITY - IMMEDIATE PICKUP, DIRECT DELIVERY. SURCHARGE OF $10.00 ADDED TO THE REGULAR RATE.

BARGAIN - SAME DAY DELIVERY BY 5 PM. SHIPMENT MUST BE AVAILABLE FOR PICKUP BY 11 AM. DISCOUNT OF 20% OFF REGULAR RATES. NOTE: NOT AVAILABLE TO OUTLYING AREAS.

ADDITIONAL CHARGES

Afternoon Rush Hour Charge - for all Regular & Priority service deliveries placed after 3 pm, $4.00 is added to the call Trips entirely within Northern Virginia are exempt from this charge.

Attempts - $5.00 minimum or 50% of the rate to a maximum of $15.00. Maximum does not apply to Outlying Areas.

Monday through Friday, 7 pm to 6 am, and all day Saturday, Sunday & Holidays - $30.00 minimum against the actual charge for the call.

Waiting Time - first ten minutes *free* then 30 cents per minute.

Weight - 50 lbs. included, then $5.00 per hundred pounds or portion thereof.

SERVICE LIMITATIONS

* No single piece to exceed 100 lbs.
* No shipments to exceed 1000 lbs. in total weight.
* No fragile, unpacked shipments.

If the above limitations are not met, [ ] Trucking rates may apply. Please call for a quotation.

ADDITIONAL FEATURES

TIME CALL - Advance scheduling for pickups at specified times.

PROOF OF DELIVERY (POD) Telephone notification to advise you of delivery time and recipient, at no charge.

SCHEDULED DELIVERIES - The same trip done on a regular basis, daily or weekly.

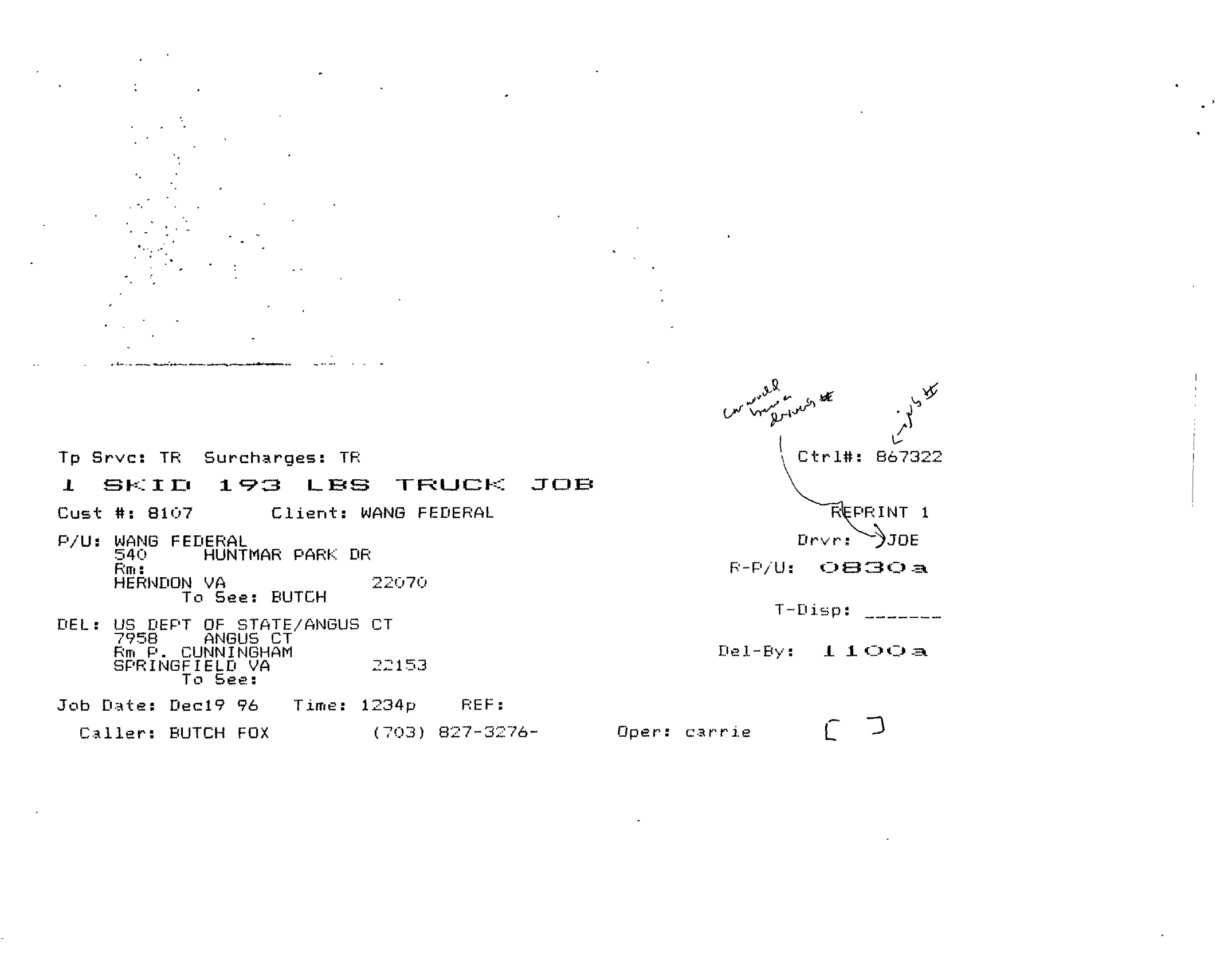
CONDITIONS OF CONTRACT

1. **In consideration of [ ] rate for transportation of any shipment, which rate, in part is independent of the value of the shipment, the shipper and all other parties having an interest in the shipment agree that the limit of [ ]'s liability shall be the lesser of: A. $100.00; or B. The amount of any damages actually sustained, unless the shipper shall have declared a value greater than $100.00 and shall have agreed to pay an insurance premium to [ ] Delivery, Inc. of 50 cents per hundred dollars of value declared prior to shipment.**
2. **In tendering the shipment for carriage, the shipper warrants that the shipment is properly packaged and labeled to insure safe transportation with ordinary care in handling.**
3. **[ ] shall not be liable for special or consequential damages.**
4. **Claims not made wihin 45 days of shipment shall be waived by the shipper.**

Form 61d 8-95

Attachment B

Sample Ticket



Tp Srvc: TR Surcharges: TR

Ctrl#: 867322

1 SKID 193 LBS TRUCK JOB

Cust #: 8107 Client: WANG FEDERAL

REPRINT 1

P/U: WANG FEDERAL
540 HUNTMAR PARK DR
Rm:
HERNDON VA 22070
To See: BUTCH

Drvr: JOE

R-P/U: 0830a

T-Disp: _____

DEL: US DEPT OF STATE/ANGUS CT
7958 ANGUS CT
Rm P. CUNNINGHAM
SPRINGFIELD VA 22153
To See:

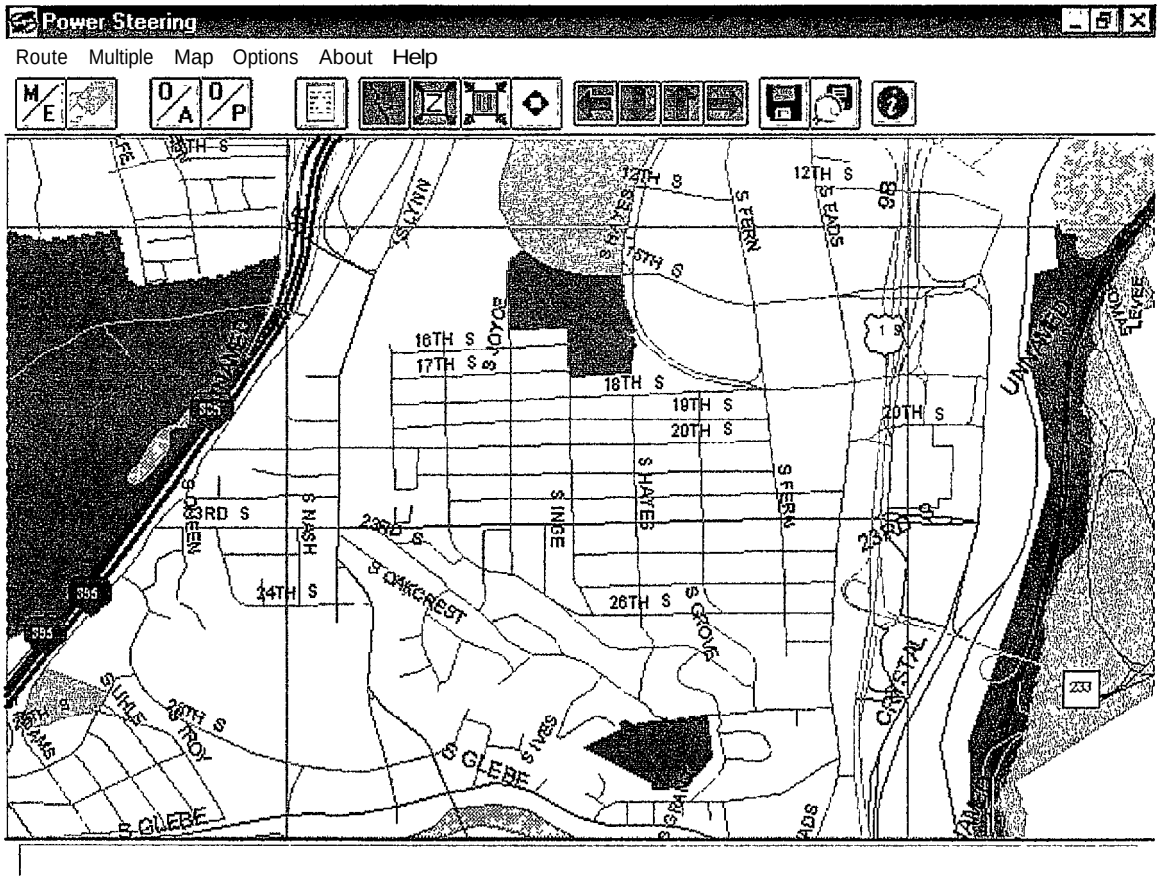
Del-By: 1100a

Job Date: Dec19 96 Time: 1234p REF:

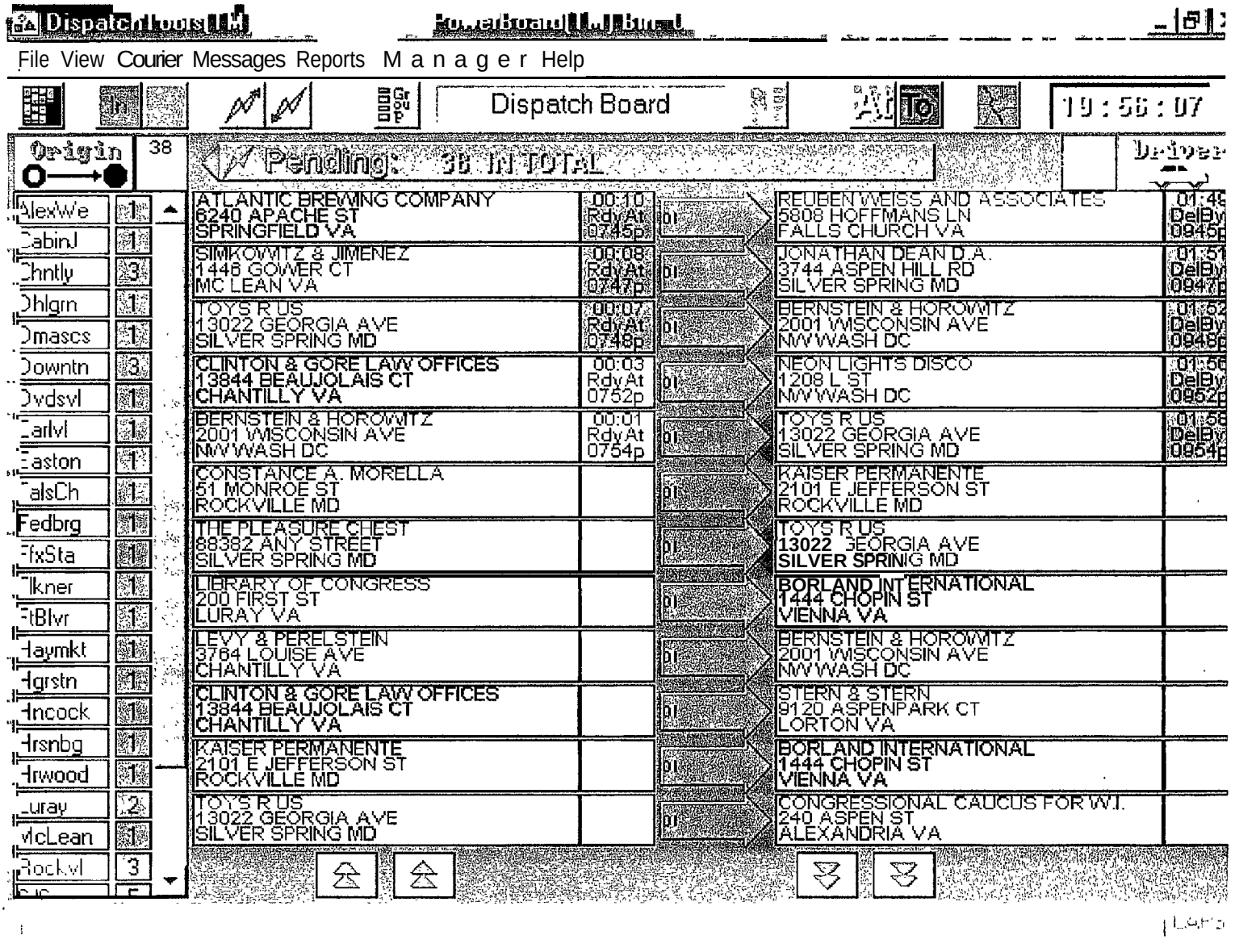
Caller: BUTCH FOX (703) 827-3276- Oper: carrie

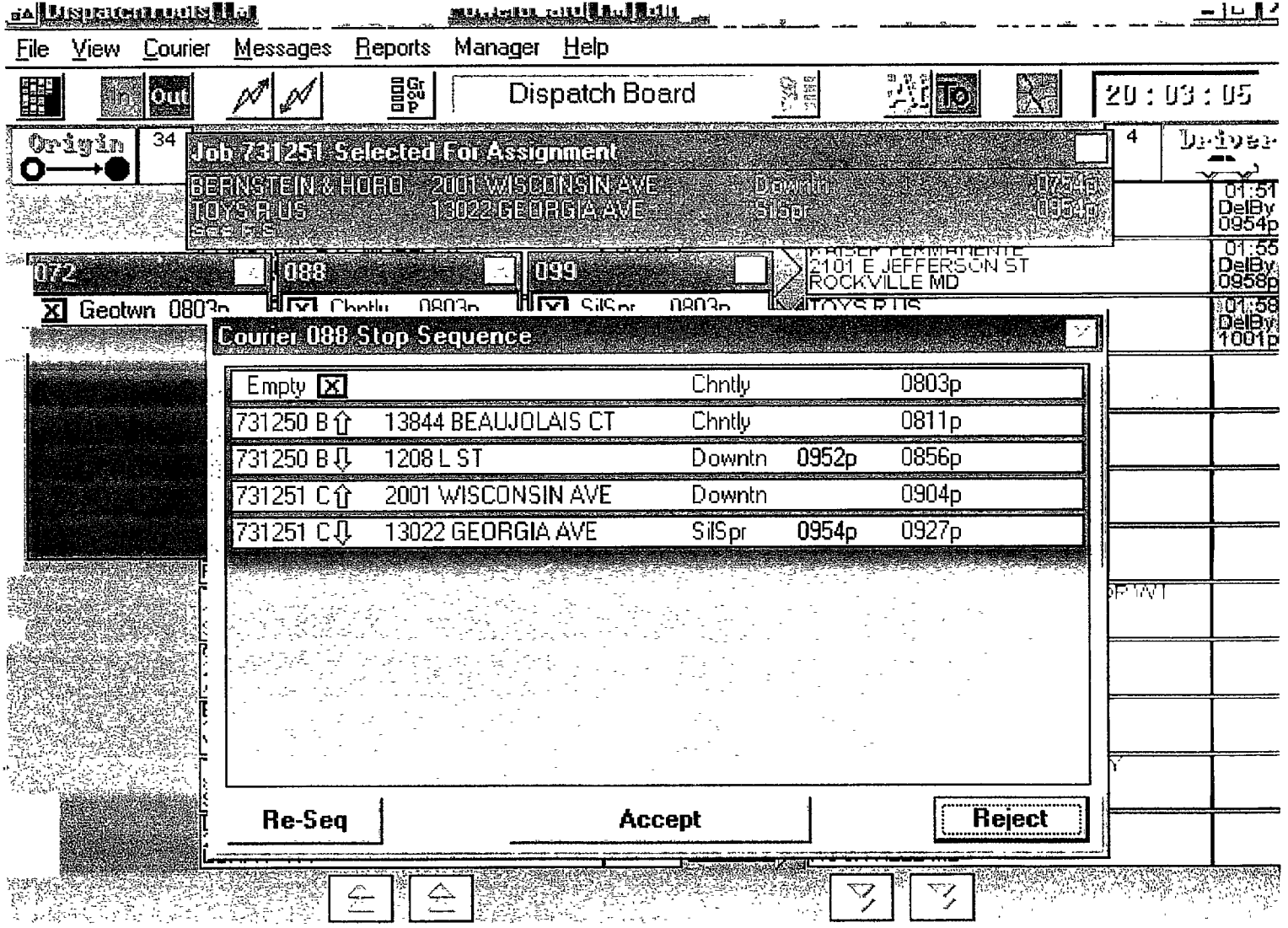
Attachment C

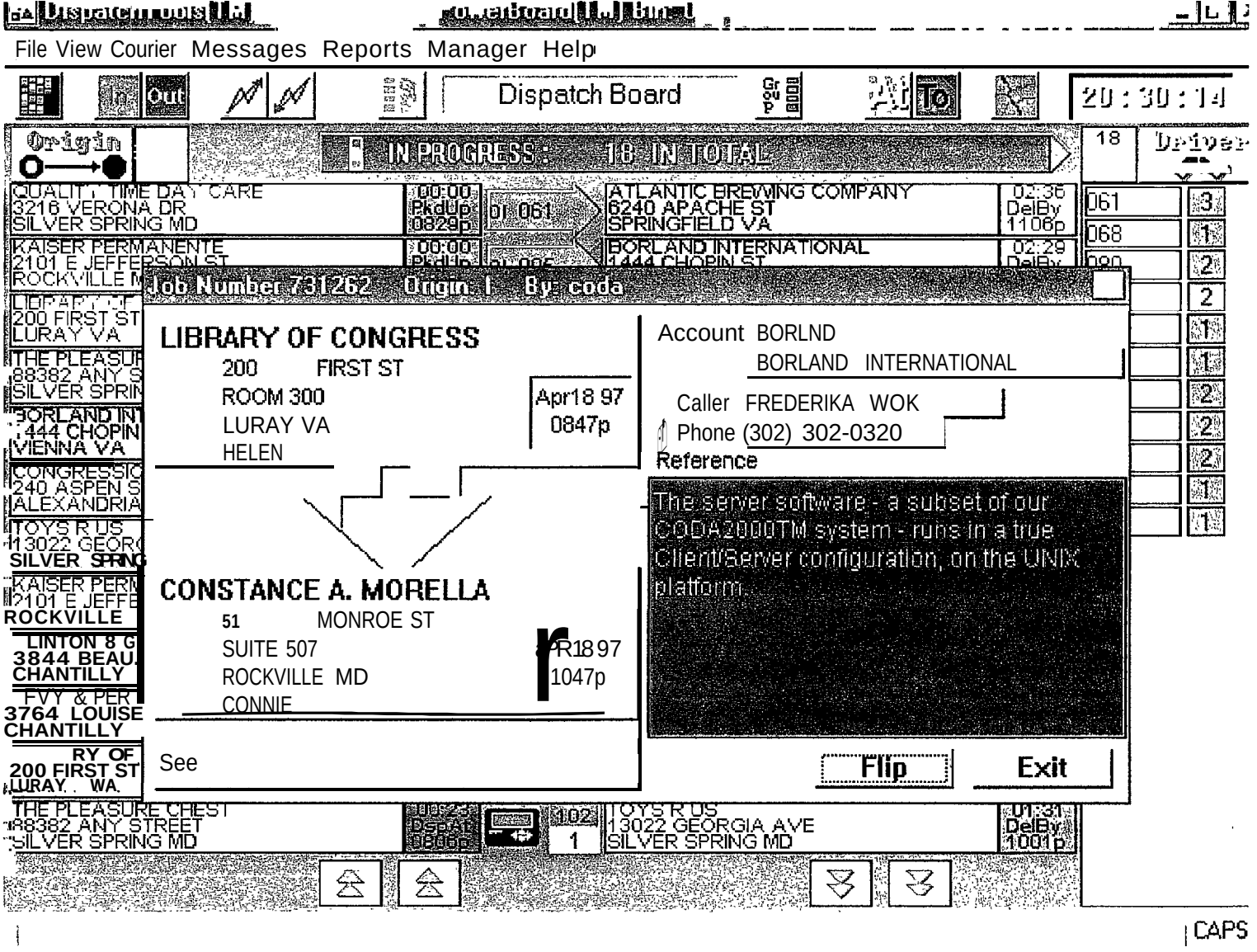
NavTech Map and *Dispatch*Tools™ Screens



Sample Map from Power Steering using *NavTech* Database.


File View Courier Messages Reports Manager Help
Dispatch Board
19:56:07
Origin 38
Pending: 38 IN TOTAL
AlexWe 1
CabinJ 1
Chntly 3
Dhlgrn 1
Dmascs 1
Downtn 3
Dvdsvl 1
Earlvl 1
Easton 1
FalsCh 1
Fedbrg 1
FfxSta 1
Flkner 1
FtBlvr 1
Haymkt 1
Hgrstn 1
Hncock 1
Hrsnbg 1
Hrwood 1
Luray 2
McLean 1
Rockvl 3
ATLANTIC BREWING COMPANY
6240 APACHE ST
SPRINGFIELD VA
00:10
RdyAt
0745p
REUBEN WEISS AND ASSOCIATES
5808 HOFFMANS LN
FALLS CHURCH VA
SIMKOWITZ & JIMENEZ
1446 GOWER CT
MC LEAN VA
00:08
RdyAt
0747p
JONATHAN DEAN D.A.
3744 ASPEN HILL RD
SILVER SPRING MD
TOYS R US
13022 GEORGIA AVE
SILVER SPRING MD
00:07
RdyAt
0748p
BERNSTEIN & HOROWITZ
2001 WISCONSIN AVE
NWWASH DC
CLINTON & GORE LAW OFFICES
13844 BEAUJOLAIS CT
CHANTILLY VA
00:03
RdyAt
0752p
NEON LIGHTS DISCO
1208 L ST
NWWASH DC
BERNSTEIN & HOROWITZ
2001 WISCONSIN AVE
NWWASH DC
00:01
RdyAt
0754p
TOYS R US
13022 GEORGIA AVE
SILVER SPRING MD
CONSTANCE A. MORELLA
51 MONROE ST
ROCKVILLE MD
KAISER PERMANENTE
2101 E JEFFERSON ST
ROCKVILLE MD
THE PLEASURE CHEST
88382 ANY STREET
SILVER SPRING MD
TOYS R US
13022 GEORGIA AVE
SILVER SPRING MD
LIBRARY OF CONGRESS
200 FIRST ST
LURAY VA
BORLAND INTERNATIONAL
1444 CHOPIN ST
VIENNA VA
LEVY & PERELSTEIN
3764 LOUISE AVE
CHANTILLY VA
BERNSTEIN & HOROWITZ
2001 WISCONSIN AVE
NWWASH DC
CLINTON & GORE LAW OFFICES
13844 BEAUJOLAIS CT
CHANTILLY VA
STERN & STERN
9120 ASPENPARK CT
LORTON VA
KAISER PERMANENTE
2101 E JEFFERSON ST
ROCKVILLE MD
BORLAND INTERNATIONAL
1444 CHOPIN ST
VIENNA VA
TOYS R US
13022 GEORGIA AVE
SILVER SPRING MD
CONGRESSIONAL CAUCUS FOR W.I.
240 ASPEN ST
ALEXANDRIA VA


File View Courier Messages Reports Manager Help
Dispatch Board
20 : 03 : 05
Origin
34
Job 731251 Selected For Assignment
BERNSTEIN & HORO 2001 WISCONSIN AVE Downtn 0754p
TOYS R US 13022 GEORGIA AVE SilSpr 0954p
072
088
099
Courier 088 Stop Sequence
Empty X Chntly 0803p
731250 B 13844 BEAUJOLAIS CT Chntly 0811p
731250 B 1208 L ST Downtn 0952p 0856p
731251 C 2001 WISCONSIN AVE Downtn 0904p
731251 C 13022 GEORGIA AVE SilSpr 0954p 0927p
Re-Seq
Accept
Reject


File View Courier Messages Reports Manager Help
Dispatch Board
20:30:14
Origin
IN PROGRESS : 18 IN TOTAL
18
Driver
QUALITY TIME DAY CARE
3216 VERONA DR
SILVER SPRING MD
00:00 PkdUp 0829p
or 061
ATLANTIC BREWING COMPANY
6240 APACHE ST
SPRINGFIELD VA
02:36 DelBy 1106p
061
068
KAISER PERMANENTE
2101 E JEFFERSON ST
ROCKVILLE M
00:00 PkdUp
BORLAND INTERNATIONAL
1444 CHOPIN ST
02:29 DelBy
Job Number 731262 Origin 1 By coda
LIBRARY OF CONGRESS
200 FIRST ST
LURAY VA
THE PLEASUR
88382 ANY S
SILVER SPRIN
BORLAND INT
1444 CHOPIN
VIENNA VA
CONGRESSIC
240 ASPEN S
ALEXANDRIA
TOYS R US
13022 GEORG
SILVER SPRIN
KAISER PERM
2101 E JEFFE
ROCKVILLE
LINTON 8 G
3844 BEAU
CHANTILLY
FVY & PER
3764 LOUISE
CHANTILLY
RY OF
200 FIRST ST
LURAY VA
LIBRARY OF CONGRESS
200 FIRST ST
ROOM 300
LURAY VA
HELEN
Apr18 97
0847p
Account BORLND
BORLAND INTERNATIONAL
Caller FREDERIKA WOK
Phone (302) 302-0320
Reference
The server software - a subset of our CODA2000TM system - runs in a true Client/Server configuration, on the UNIX platform.
CONSTANCE A. MORELLA
51 MONROE ST
SUITE 507
ROCKVILLE MD
CONNIE
APR18 97
1047p
See
Flip
Exit
THE PLEASURE CHEST
88382 ANY STREET
SILVER SPRING MD
00:23 DspAt 0840p
102
1
TOYS R US
13022 GEORGIA AVE
SILVER SPRING MD
01:31 DelBy 1001p
CAPS

Attachment D

Delivery Data

July 1996 - October 1996
and
July 1997 - October 1997

Driver Productivity Data

Year	1996						1997						
Driver	102						102						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	5.00			5.00			15.00		1.00	16.00			
7/23/96	10.00		1.00	11.00			15.00			15.00			
7/24/96	10.00		1.00	11.00			7.00		1.00	8.00			
7/25/96	10.00		1.00	11.00			8.00			8.00			
7/26/96	10.00		1.00	11.00			6.00			6.00			
Weekly Totals				49.00	43.50	1.13				53.00	47.75	1.11	-1%
7/29/96	11.00	-0.71		10.29			8.00			8.00			
7/30/96	12.00		1.00	13.00			8.00			8.00			
7/31/96	11.00		1.00	12.00			9.00			9.00			
8/1/96	14.00	-0.95	1.00	14.05			10.00	-0.50		9.50			
8/2/96	5.00			5.00			9.00			9.00			
Weekly Totals				54.34	40.50	1.34				43.50	40.00	1.09	-19%
8/19/96	13.00		2.00	15.00			8.00		1.00	9.00			
8/20/96	12.00		1.00	13.00			11.00			11.00			
8/21/96	11.00		1.00	12.00			11.00			11.00			
8/22/96	14.00		1.00	15.00			7.00			7.00			
8/23/96	13.00		1.00	14.00			9.00			9.00			
Weekly Totals				69.00	47.50	1.45				47.00	50.00	0.94	-35%
8/26/96	15.00		1.00	16.00			6.00			6.00			
8/27/96	12.00		1.00	13.00			10.00			10.00			
8/28/96	13.00		1.00	14.00			9.00	1.00		10.00			
8/29/96	13.00		1.00	14.00			7.00			7.00			
8/30/96	8.00			8.00			7.00			7.00			
Weekly Totals				65.00	28.00	2.32				40.00	49.50	0.81	-65%
9/2/96				0.00			0.00			0.00			
9/3/96	5.00			5.00			8.00			8.00			
9/4/96	13.00		1.00	14.00			11.00			11.00			
9/5/96	12.00		1.00	13.00			9.00			9.00			
9/6/96				0.00			0.00			0.00			
Weekly Totals				32.00	35.50	0.90				28.00	29.50	0.95	5%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	13.00	-0.70	1.00	13.30			8.00			8.00			
9/10/96	13.00		1.00	14.00			8.00			8.00			
9/11/96	11.00		1.00	12.00			9.00		1.00	9.00			
9/12/96	**14.00**		1.00	15.00			9.00			9.00			
9/13/96				0.00			4.00			4.00			
Weekly Totals				54.30	40.25	1.35				39.00	49.50	0.79	-42%
9/16/96	16.00		2.00	18.00			11.00			11.00			
9/17/96	16.00		2.00	18.00			7.00	-0.25		6.75			
9/18/96	16.00		2.00	18.00			6.00			6.00			
9/19/96	1.00			1.00			9.00			9.00			
9/20/96	13.00		2.00	15.00			4.00			4.00			
Weekly Totals				70.00	35.50	1.97				36.75	47.50	0.77	-61%
9/23/96	8.00		2.00	10.00			9.00	-0.66		8.34			
9/24/96	9.00		2.00	11.00			9.00			9.00			
9/25/96	6.00		2.00	8.00			11.00	-0.50	3.00	13.50			
9/26/96	5.00		1.00	6.00			21.00	-1.29	3.00	22.71			
9/27/96				0.00			21.00			21.00			
Weekly Totals				35.00	44.00	0.80				74.55	49.50	1.51	89%
9/30/96	12.00		1.00	13.00			21.00		3.00	24.00			
10/1/96	12.00			12.00			21.00	-0.66	3.00	23.34			
10/2/96	11.00			11.00			26.00			26.00			
10/3/96	6.00			6.00			9.00			9.00			
10/4/96	10.00			10.00			9.00			9.00			
Weekly Totals				52.00	49.25	1.06				91.34	52.75	1.73	64%
10/7/96	12.00		1.00	13.00			0.00			0.00			
10/8/96	10.00		3.00	13.00			0.00			0.00			
10/9/96	15.00		1.00	16.00			0.00			0.00			
10/10/96	14.00		1.00	15.00			0.00			0.00			
10/11/96	16.00		1.00	17.00			0.00			0.00			
Weekly Totals				74.00	35.00	2.11				0.00			
10/14/96				0.00			14.00		2.00	16.00	0.00	0.00	0%
10/15/96	11.00			11.00			16.00			16.00			
10/16/96	12.00			12.00			14.00		1.00	15.00			
10/17/96	10.00		2.00	12.00			10.00			10.00			
10/18/96	14.00		2.00	16.00			12.00			12.00			
Weekly Totals				51.00	40.50	1.17				69.00	46.50	1.48	27%
Totals				605.64	442.50	1.37				522.14	462.50	1.13	-18%

Driver Productivity Data

Year	1996						1997						
Driver	107						107						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	2.00	none	none	2.00			3.00	none	none	3.00			
7/23/96	2.00			2.00			3.00			3.00			
7/24/96	3.00			3.00			3.00			3.00			
7/25/96	3.00			3.00			3.00			3.00			
7/26/96	3.00			3.00			3.00			3.00			
Weekly Totals				13.00	24.00	0.54				15.00	40.00	0.37	31%
7/29/96	2.00			2.00			3.00			3.00			
7/30/96	2.00			2.00			4.00			4.00			
7/31/96	2.00			2.00			3.00			3.00			
8/1/96	2.00			2.00			3.00			3.00			
8/2/96	2.00			2.00			3.00			3.00			
Weekly Totals				15.00	40.00	0.37				16.00	40.00	0.40	8%
8/19/96	3.00			3.00			3.00			3.00			
8/20/96	3.00			3.00			3.00			3.00			
8/21/96	3.00			3.00			3.00			3.00			
8/22/96	3.00			3.00			3.00			3.00			
8/23/96	3.00			3.00			4.00			4.00			
Weekly Totals				10.00	40.00	0.25				16.00	40.00	0.40	60%
8/26/96	2.00			2.00			3.00			3.00			
8/27/96	2.00			2.00			3.00			3.00			
8/28/96	2.00			2.00			4.00			4.00			
8/29/96	2.00			2.00			3.00			3.00			
8/30/96	2.00			2.00			3.00			3.00			
Weekly Totals				10.00	32.00	0.31				16.00	40.00	0.40	29%
9/2/96	2.00			2.00			3.00			3.00			
9/3/96	2.00			2.00			4.00			4.00			
9/4/96	2.00			2.00			2.00			2.00			
9/5/96	2.00			2.00			4.00			4.00			
9/6/96	2.00			2.00			3.00			3.00			
Weekly Totals				10.00	40.00	0.25				16.00	40.00	0.40	60%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	0.00			0.00			0.00			0.00			
9/10/96	2.00			2.00			3.00			3.00			
9/11/96	2.00			2.00			3.00			3.00			
9/12/96	2.00			2.00			3.00			3.00			
9/13/96	2.00			2.00			3.00			3.00			
Weekly Totals				8.00	40.00	0.20				12.00	32.00	0.37	85%
9/16/96	2.00			2.00			4.00			4.00			
9/17/96	2.00			2.00			4.00			4.00			
9/18/96	2.00			2.00			3.00			3.00			
9/19/96	2.00			2.00			3.00			3.00			
9/20/96	2.00			2.00			4.00			4.00			
Weekly Totals				10.00	40.00	0.25				18.00	40.00	0.45	80%
9/23/96	2.00			2.00			3.00			3.00			
9/24/96	2.00			2.00			4.00			4.00			
9/25/96	2.00			2.00			3.00			3.00			
9/26/96	2.00			2.00			4.00			4.00			
9/27/96	2.00			2.00			3.00			3.00			
Weekly Totals				10.00	40.00	0.25				17.00	32.00	0.53	112%
9/30/96	2.00			2.00			4.00			4.00			
10/1/96	2.00			2.00			0.00			0.00			
10/2/96	2.00			2.00			3.00			3.00			
10/3/96	2.00			2.00			4.00			4.00			
10/4/96	2.00			2.00			3.00			3.00			
Weekly Totals				10.00	40.00	0.25				14.00	32.00	0.43	72%
10/7/96	2.00			2.00			3.00			3.00			
10/8/96	2.00			2.00			3.00			3.00			
10/9/96	2.00			2.00			4.00			4.00			
10/10/96	2.00			2.00			3.00			3.00			
10/11/96	2.00			2.00			4.00			4.00			
Weekly Totals				10.00	40.00	0.25				16.00	40.00	0.40	60%
10/14/96	0.00			0.00			4.00			4.00			
10/15/96	0.00			0.00			4.00			4.00			
10/16/96	2.00			2.00			3.00			3.00			
10/17/96	2.00			2.00			4.00			4.00			
10/18/96	2.00			2.00			4.00			4.00			
Weekly Totals				8.00	32.00	0.25				19.00	32.00	0.59	136%
Totals				114.00	408.00	0.28				176.00	408.00	0.43	54%

Driver Productivity Data

Year	1996						1997						
Driver	129						129						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	11.00			11.00			14.00			14.00			
7/23/96	11.00			11.00			15.00	-0.50		14.50			
7/24/96	11.00			11.00			15.00			15.00			
7/25/96	10.00			10.00			13.00		-0.34	12.66			
7/26/96	9.00			9.00			14.00			14.00			
Weekly Totals				52.00	32.50	180				70.16	40.00	1.75	10%
7/29/96	11.00			11.00			13.00			13.00			
7/30/96	10.00			10.00			14.00			14.00			
7/31/96	11.00			11.00			14.00			14.00			
8/1/96	11.00			11.00			14.00			14.00			
8/2/96	10.00			10.00			13.00			13.00			
Weekly Totals				53.00	35.50	1.49				68.00	40.00	1.70	14%
8/19/96	11.00			11.00			18.00			18.00			
8/20/96	11.00			11.00			15.00			15.00			
8/21/96	11.00			11.00			13.00			13.00			
8/22/96	11.00			11.00			15.00			15.00			
8/23/96	11.00			11.00			14.00			14.00			
Weekly Totals				55.00	32.50	1.69				75.00	40.00	1.86	11%
8/26/96	11.00			11.00			17.00	-0.50		16.50			
8/27/96	11.00			11.00			17.00			17.00			
8/28/96	12.00			12.00			17.00			17.00			
8/29/96	11.00			11.00			0.00			0.00			
8/30/96	11.00			11.00			12.00			12.00			
Weekly Totals				56.00	32.50	1.72				62.50	24.00	2.60	51%
9/2/96				0.00			0.00			0.00			
9/3/96	12.00			12.00			16.00		-0.34	15.66			
9/4/96	12.00			12.00			17.00			17.00			
9/5/96	12.00	-0.50		11.50			16.00			16.00			
9/6/96	12.00	-0.50		11.50			13.00			13.00			
Weekly Totals				47.00	35.00	1.34				61.66	32.00	1.93	43%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	12.00	-0.50		11.50			13.00			13.00			
9/10/96	12.00	-0.50		11.50			15.00		1.00	16.00			
9/11/96	12.00	-0.50		11.50			16.00		0.34	16.34			
9/12/96	12.00	-0.50		11.50			17.00			17.00			
9/13/96	11.00			11.00			18.00			18.00			
Weekly Totals				57.00	35.00	1.63				80.34	40.00	2.01	23%
9/16/96	11.00			11.00			21.00			21.00			
9/17/96	11.00	-0.67		10.33			15.00			15.00			
9/18/96	11.00			11.00			16.00			16.00			
9/19/96	11.00			11.00			13.00			13.00			
9/20/96	11.00			11.00			14.00			14.00			
Weekly Totals				54.33	40.00	1.36				79.00	40.00	1.90	45%
9/23/96	12.00			12.00			18.00		-0.34	17.66			
9/24/96	11.00			11.00			16.00			16.00			
9/25/96	11.00			11.00			14.00			14.00			
9/26/96	11.00			11.00			14.00			14.00			
9/27/96	11.00			11.00			16.00			16.00			
Weekly Totals				56.00	40.00	1.40				77.66	40.00	1.94	39%
9/30/96	11.00			11.00			16.00			16.00			
10/1/96	11.00			11.00			16.00		1.00	17.00			
10/2/96	11.00			11.00			17.00			17.00			
10/3/96	11.00			11.00			14.00			14.00			
10/4/96	11.00			11.00			19.00			19.00			
Weekly Totals				55.00	40.00	1.38				83.00	40.00	2.08	51%
10/7/96	11.00			11.00			15.00			15.00			
10/8/96	11.00	-0.50		10.50			19.00			19.00			
10/9/96	12.00			12.00			15.00			15.00			
10/10/96	11.00			11.00			14.00			14.00			
10/11/96	11.00			11.00			14.00			14.00			
Weekly Totals				55.50	40.00	1.39				77.00	40.00	0.01	0%
10/14/96	6.00		1.00	7.00			1.00	-0.50		0.50			
10/15/96	13.00	-0.50		12.50			17.00			17.00			
10/16/96	12.00			12.00			14.00			14.00			
10/17/96	11.00			11.00			16.00			16.00			
10/18/96	12.00			12.00			15.00			15.00			
Weekly Totals				54.50	32.00	1.70				62.50	32.00	1.95	15%
Totals				595.33	395.00	1.51				796.82	408.00	1.95	30%

Driver Productivity Data

Year	1996						1997						
Driver	147						147						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	11.00		2.00	13.00			11.00	-0.50		10.50			
7/23/96	13.00		2.00	15.00			16.00			16.00			
7/24/96	13.00		2.00	15.00			13.00		1.00	14.00			
7/25/96	13.00		2.00	15.00			18.00			18.00			
7/26/96	13.00		2.00	15.00			14.00			14.00			
Weekly Totals				73.00	37.50	1.95				72.50	25.00	2.90	49%
7/29/96	13.00		2.00	15.00			15.00			15.00			
7/30/96	12.00		2.00	14.00			14.00			14.00			
7/31/96	13.00		2.00	15.00			15.00			15.00			
8/1/96	13.00		2.00	15.00			19.00			19.00			
8/2/96	13.00		2.00	15.00			18.00			18.00			
Weekly Totals				74.00	37.50	1.97				81.00	33.50	2.42	23%
8/19/96	13.00		2.00	15.00			17.00			17.00			
8/20/96	13.00		2.00	15.00			20.00			20.00			
8/21/96	13.00		2.00	15.00			17.00			17.00			
8/22/96	13.00		2.00	15.00			14.00			14.00			
8/23/96	13.00		2.00	15.00			17.00			17.00			
Weekly Totals				75.00	37.50	2.00				85.00	34.25	2.48	24%
8/26/96	12.00		2.00	14.00			16.00		1.00	17.00			
8/27/96	13.00		2.00	15.00			18.00		1.00	19.00			
8/28/96	14.00		2.00	16.00			17.00	-0.50		16.50			
8/29/96	15.00		2.00	17.00			16.00		1.00	17.00			
8/30/96	14.00		2.00	16.00			22.00			22.00			
Weekly Totals				78.00	30.00	2.60				91.50	34.25	2.67	3%
9/2/96				0.00			0.00			0.00			
9/3/96	13.00		2.00	15.00			23.00			23.00			
9/4/96	14.00		2.00	16.00			17.00			17.00			
9/5/96	13.00		2.00	15.00			18.00			18.00			
9/6/96	14.00		2.00	16.00			20.00			20.00			
Weekly Totals				62.00	37.50	1.65				78.00	27.00	7.89	75%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	13.00		2.00	15.00			17.00			17.00			
9/10/96	13.00		2.00	15.00			22.00			22.00			
9/11/96	13.00		2.00	15.00			22.00			22.00			
9/12/96	13.00		2.00	15.00			15.00			15.00			
9/13/96	16.00		2.00	18.00			26.00			26.00			
Weekly Totals				78.00	37.50	2.08				102.00	35.25	2.89	39%
9/16/96	13.00		24.00	18.00			3.00			3.00			
9/17/96	13.00		2.00	15.00			14.00			14.00			
9/18/96	13.00		2.00	15.00			18.00			18.00			
9/19/96	13.00		2.00	15.00			18.00			18.00			
9/20/96	14.00		2.00	16.00			24.00			24.00			
Weekly Totals				79.00	37.50	2.11				77.00	34.25	2.25	7%
9/23/96	13.00		2.00	15.00			18.00			18.00			
9/24/96	14.00		2.00	16.00			21.00			21.00			
9/25/96	13.00		2.00	15.00			19.00			19.00			
9/26/96	14.00		2.00	16.00			22.00			22.00			
9/27/96	13.00		2.00	15.00			22.00			22.00			
Weekly Totals				77.00	21.25	3.82				102.00	36.00	2.83	-22%
9/30/96	18.00	-2.16	0.34	16.18			22.00	-0.41		21.59			
10/1/96	18.00	-2.66	0.34	15.68			18.00	-0.83		17.17			
10/2/96	18.00	-2.66	0.34	15.68			19.00			19.00			
10/3/96	19.00	-2.66	0.34	16.68			16.00			16.00			
10/4/96	17.00	-2.83	0.34	14.51			20.00			20.00			
Weekly Totals				78.73	17.00	4.63				93.76	31.25	3.00	-35%
10/7/96	1.00	-0.50		0.50			19.00			19.00			
10/8/96	18.00	-2.66	0.34	15.68			0.00			0.00			
10/9/96	17.00	-3.33	0.34	14.01			16.00			16.00			
10/10/96	17.00	-2.16	0.34	15.18			18.00			18.00			
10/11/96	17.00	-2.16	0.34	15.18			22.00			22.00			
Weekly Totals				60.55	32.00	1.89				75.00	28.50	2.63	39%
10/14/96	1.00			1.00			1.00	-0.50		0.50			
10/15/96	17.00	-2.16	0.34	15.18			4.00			4.00			
10/16/96	15.00	-2.16	0.34	13.18			20.00			20.00			
10/17/96	16.00	-2.16	0.34	14.18			22.00			22.00			
10/18/96	23.00	-2.16	0.34	21.18			18.00			18.00			
Weekly Totals				64.72	40.00	1.62				64.50	21.00	3.07	90%
Totals				800.00	365.25	2.19				922.26	340.25	2.71	24%

Driver Productivity Data

Year	1996						1997						
Driver	156						156						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	13.00	-2.00		11.00			7.00	None	None	7.00			
7/23/96	11.00	-1.00		10.00			7.00			7.00			
7/24/96	13.00	-1.50		11.50			7.00			7.00			
7/25/96	14.00	-1.50		12.50			5.00			5.00			
7/26/96	13.00	-1.50		11.50			9.00			9.00			
Weekly Totals				58.50	42.00	1.35				35.00	40.00	0.88	-35%
7/29/96	11.00	-1.50		9.50			8.00			8.00			
7/30/96	13.00	-2.00		11.00			5.00			5.00			
7/31/96	11.00	-1.00		10.00			5.00			5.00			
8/1/96	6.00			6.00			6.00			6.00			
8/2/96	14.00	-1.00		13.00			7.00			7.00			
Weekly Totals				49.50	55.00	0.90				37.00	42.00	0.88	-2%
8/19/96	11.00	-1.50		9.50			6.00			6.00			
8/20/96	6.00			6.00			8.00			8.00			
8/21/96	10.00	-1.50		8.50			4.00			4.00			
8/22/96	9.00	-1.16		7.84			6.00			6.00			
8/23/96	7.00			7.00			5.00			5.00			
Weekly Totals				38.84	50.00	0.76				29.00	40.00	0.73	-7%
8/26/96	10.00	-1.0		9.00			6.00			6.00			
8/27/96	11.00	-1.50		9.50			4.00			4.00			
8/28/96	9.00	-1.00		8.00			5.00			5.00			
8/29/96	11.00	-1.50		9.50			7.00			7.00			
8/30/96	11.00	-1.50		9.50			9.00			9.00			
Weekly Totals				45.50	50.00	0.91				31.00	40.00	0.76	-15%
9/2/96	10.00	-1.00		0.00			0.00			0.00			
9/3/96	7.00			9.0			7.00			7.00			
9/4/96	8.00			7.00			7.00			7.00			
9/5/96	7.00			8.00			7.00			7.00			
9/6/96				7.00			7.00			7.00			
Weekly Totals				31.00	50.00	0.62				28.00	32.00	0.88	41%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	12.00	-1.00		11.00			7.00			7.00			
9/10/96	13.00	-2.00		11.00			6.00			6.00			
9/11/96	11.00	-1.50		9.50			6.00			6.00			
9/12/96	11.00	-1.50		**9.50**			4.00			4.00			
9/13/96	10.00	-0.50		9.50			5.00			5.00			
Weekly Totals				50.50	50.00	1.01				28.00	40.00	0.70	-31%
9/16/96	11.00	-1.50		9.50			6.00			6.00			
9/17/96	10.00	-1.50		8.50			4.00			4.00			
9/18/96	11.00	-1.00		10.00			5.00			5.00			
9/19/96	13.00	-1.50		11.50			4.00			4.00			
9/20/96	11.00	-1.50		9.50			6.00			6.00			
Weekly Totals				49.00	47.00	1.04				25.00	40.00	0.63	-40%
9/23/96	13.00	-1.50		11.50			7.00			7.00			
9/24/96	11.00	-1.50		9.50			7.00			7.00			
9/25/96	11.00	-2.00		9.00			5.00			5.00			
9/26/96	10.00	-1.50		8.50			6.00			6.00			
9/27/96	12.00	-2.00		10.00			5.00			5.00			
Weekly Totals				48.50	46.00	1.05				30.00	40.00	0.75	-29%
9/30/96	9.00	-1.00		8.00			0.00			0.00			
10/1/96	13.00	-2.50		10.50			0.00			0.00			
10/2/96	9.00	-1.00		8.00			0.00			0.00			
10/3/96	12.00	-2.50		9.50			0.00			0.00			
10/4/96	12.00	-2.00		10.00			0.00			0.00			
Weekly Totals				46.00	47.00	0.98				0.00	0.00	0.00	0%
10/7/96	13.00	-2.00		11.00			0.00			0.00			
10/8/96	8.00	-0.50		7.50			0.00			0.00			
10/9/96	7.00			7.00			0.00			0.00			
10/10/96	8.00	-0.50		7.50			0.00			0.00			
10/11/96	12.00	1.00		13.00			0.00			0.00			
Weekly Totals				46.00	39.00	1.18				0.00	0.00	0.00	0%
10/14/96	1.00			1.0			0.00			0.00			
10/15/96	10.00	-1.00		9.00			0.00			0.00			
10/16/96	8.00	-1.00		7.00			0.00			0.00			
10/17/96	9.00	-1.50		7.50			0.00			0.00			
10/18/96	9.00	-1.00		8.00			0.00			0.00			
Weekly Totals				32.50	44.50	0.73				0.00	0.00	0.00	0%
Totals				493.84	520.50	0.95				243.00	314.00	0.77	-18%

Driver Productivity Data

Year	1996						1997						
Driver	159						159						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	14.00	-0.50	1.00	14.50			15.00		2.00	17.00			
7/23/96	14.00		1.00	15.00			15.00		2.00	17.00			
7/24/96	17.00	-0.50	1.00	17.50			18.00		2.00	20.00			
7/25/96	13.00		1.00	14.00			15.00		2.00	17.00			
7/26/96	15.00	-0.50	1.00	15.50			16.00		2.00	18.00			
Weekly Totals				76.50	40.00	1.91				89.00	40.00	2.23	16%
7/29/96	13.00		1.00	14.00			15.00		2.00	17.00			
7/30/96	15.00	-0.50	1.00	15.50			16.00		2.00	18.00			
7/31/96	18.00		1.00	17.00			17.00		2.00	19.00			
8/1/96	14.00		1.00	15.00			16.00		2.00	18.00			
8/2/96	16.00		1.00	17.00			15.00		2.00	17.00			
Weekly Totals				78.50	40.00	1.96				87.00	40.00	2.18	11%
8/19/96	17.00		1.00	18.00			17.00			17.00			
8/20/96	16.00		1.00	17.00			17.00			17.00			
8/21/96	19.00	-0.50	1.00	19.50			18.00			18.00			
8/22/96	15.00		1.00	16.00			15.00			15.00			
8/23/96	17.00		1.00	18.00			16.00			16.00			
Weekly Totals				88.50	40.00	2.21				83.00	40.00	2.08	-6%
8/26/96	15.00		1.00	16.00			15.00		2.00	17.00			
8/27/96	17.00	-0.50	1.00	17.50			17.00		2.00	19.00			
8/28/96	18.00		1.00	19.00			18.00		2.00	20.00			
8/29/96	17.00	-0.50	1.00	17.50			18.00		2.00	20.00			
8/30/96	17.00		1.00	18.00			17.00		2.00	19.00			
Weekly Totals				88.00	32.00	2.75				95.00	40.00	2.38	-14%
9/2/96				0.00			0.00			0.00			
9/3/96	15.00		1.00	16.00			18.00		2.00	20.00			
9/4/96	20.00		1.00	21.00			21.00		2.00	23.00			
9/5/96	15.00		1.00	16.00			17.00		2.00	19.00			
9/6/96	18.00		1.00	19.00			18.00		2.00	20.00			
Weekly Totals				72.00	40.00	1.80				82.00	32.00	2.56	42%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	15.00		1.00	16.00			16.00		2.00	18.00			
9/10/96	17.00	-0.50	1.00	17.50			17.00		2.00	19.00			
9/11/96	18.00		1.00	19.00			18.00		2.00	20.00			
9/12/96	15.00	-0.50	1.00	15.50			17.00		2.00	19.00			
9/13/96	16.00		1.00	17.00			16.00		2.00	18.00			
Weekly Totals				85.00	38.00	2.24				94.00	40.00	2.35	5%
9/16/96	16.00	-0.50	1.00	16.50			17.00		2.00	19.00			
9/17/96	16.00		1.00	17.00			16.00		2.00	18.00			
9/18/96	18.00		1.00	19.00			20.00		3.00	23.00			
9/19/96	16.00	-0.50	1.00	16.50			17.00		3.00	20.00			
9/20/96	16.00		1.00	17.00			18.00		3.00	21.00			
Weekly Totals				86.00	36.00	2.39				101.00	40.00	2.53	6%
9/23/96	16.00	-0.50	1.00	16.50			17.00		3.00	20.00			
9/24/96	16.00		1.00	17.00			18.00		3.00	21.00			
9/25/96	19.00	-0.50	1.00	19.50			19.00		3.00	22.00			
9/26/96	10.00		1.00	11.00			0.00		0.00	0.00			
9/27/96	13.00	-0.50	1.00	13.50			0.00		0.00	0.00			
Weekly Totals				77.50	40.00	1.94				63.00	24.00	2.63	35%
9/30/96	18.00		2.00	20.00			0.00			0.00			
10/1/96	18.00	-0.50	2.00	19.50			0.00			0.00			
10/2/96	19.00		2.00	21.00			0.00			0.00			
10/3/96	16.00	-0.50	2.00	17.50			18.00		3.00	21.00			
10/4/96	14.00		2.00	16.00			17.00		3.00	20.00			
Weekly Totals				94.00	40.00	2.35				41.00	16.00	2.56	9%
10/7/96	17.00	-0.50	2.00	18.50			17.00		3.00	20.0			
10/8/96	14.00		2.00	16.00			18.00		3.00	21.00			
10/9/96	17.00		2.00	19.00			19.00		3.00	22.00			
10/10/96	14.00		2.00	16.00			18.00		3.00	21.00			
10/11/96	17.00	-0.50	2.00	18.50			17.00		3.00	20.00			
Weekly Totals				88.00	32.00	2.75				104.00	40.00	2.60	-5%
10/14/96				0.00			0.00		0.00	0.00			
10/15/96	14.00		2.00	16.00			16.00		3.00	19.00			
10/16/96	18.00		2.00	20.00			20.00		3.00	23.00			
10/17/96	17.00	-0.50	2.00	18.50			17.00		3.00	20.00			
10/18/96	15.00		2.00	17.00			17.00		3.00	20.00			
Weekly Totals				71.50	40.00	1.79				82.00	32.00	2.56	43%
Totals				905.50	410.00	2.17				921.00	384.00	2.40	11%

Driver Productivity Data

Year	1996						1997						
Driver	163						163						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	9.00	-0.50		8.50			11.00	0.00		11.00			
7/23/96	7.00	-0.50		6.50			10.00			10.00			
7/24/96	1.00			1.00			10.00		1.00	11.00			
7/25/96	5.00	-0.50		4.50			7.00			7.00			
7/26/96	7.00	-0.50		6.50			14.00			14.00			
Weekly Totals				27.00	40.00	0.68		0.00		53.00	40.00	1.33	96%
7/29/96	8.00	-1.00		7.00			14.00		1.00	15.00			
7/30/96	7.00	-0.50		6.50			10.00	-0.50	2.00	11.50			
7/31/96	7.00	-0.33		6.67			9.00			9.00			
8/1/96	5.00	-0.50		4.50			10.00		1.00	11.00			
8/2/96	7.00	-0.50		6.50			11.00			11.00			
Weekly Totals				31.17	40.00	0.78				57.50	40.00	1.44	84%
8/19/96	0.00			0.00			14.00	-0.50		13.50			
8/20/96	0.00			0.00			16.00		1.00	17.00			
8/21/96	0.00			0.00			12.00		1.00	13.00			
8/22/96	0.00			0.00			15.00			15.00			
8/23/96	0.00			0.00			11.00			11.00			
Weekly Totals				0.00	0.00	0.00				69.50	40.00	1.74	0%
8/26/96	2.00			2.00			14.00			14.00			
8/27/96	3.00			3.00			9.00		1.00	10.00			
8/28/96	3.00			3.00			11.00		1.00	12.00			
8/29/96	4.00	-0.50		3.50			8.00			8.00			
8/30/96	4.00	-0.50		3.50			11.00			11.00			
Weekly Totals				15.00	32.00	0.47				55.00	40.00	1.38	193%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	8.00	-0.50		7.50			10.00			10.00			
9/4/96	6.00	-0.50		5.50			0.00		1.00	1.00			
9/5/96	4.00	-0.50		3.50			8.00			8.00			
9/6/96	8.00	-0.50		7.50			13.00			13.00			
Weekly Totals				24.00	40.00	0.60				32.00	24.00	1.33	122%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	7.00	-0.50		6.50			11.00		1.00	11.00			
9/10/96	6.00	-0.50		5.50			7.00	-0.70		6.30			
9/11/96	7.00	-0.83		6.17			12.00	-0.50	2.00	13.50			
9/12/96	4.00	-0.50		**3.50**			11.00			11.00			
9/13/96	6.00	-0.50		5.50			15.00		2.00	17.00			
Weekly Totals				27.17	40.00	0.68				58.80	40.00	1.47	116%
9/16/96	8.00	-1.00		7.00			12.00	-0.50	1.00	12.50			
9/17/96	7.00	-0.50		6.50			10.00	-0.50		9.50			
9/18/96	4.00	-0.50		3.50			12.00		1.00	13.00			
9/19/96	4.00	-0.50		3.50			8.00			8.00			
9/20/96	6.00	-0.50		5.50			11.00		2.00	13.00			
Weekly Totals				26.00	40.00	0.65				56.00	40.00	1.40	115%
9/23/96	8.00	-1.00		7.00			14.00	-1.32	1.00	13.68			
9/24/96	6.00	-0.50		5.50			1.00			1.00			
9/25/96	6.00	-1.00		5.00			12.00		1.00	13.00			
9/26/96	4.00	-0.50		3.50			9.00			9.00			
9/27/96	6.00	-0.50		5.50			16.00		2.00	18.00			
Weekly Totals				26.50	32.50	0.82				54.68	32.00	1.71	110%
9/30/96	13.00	-2.16		10.84			13.00			13.00			
10/1/96	13.00	-2.66		10.34			9.00		1.00	10.00			
10/2/96	14.00	-2.16		11.84			1.00			1.00			
10/3/96	12.00	-2.16		9.84			7.00		2.00	9.00			
10/4/96	14.0	-2.66	1.00	12.34			13.00			13.00			
Weekly Totals				55.20	26.00	2.12				46.00	32.00	1.44	-32%
10/7/96	14.00	-3.00		11.00			13.00		1.00	14.00			
10/8/96	14.00	-3.50		10.50			11.00			11.00			
10/9/96	14.0	-2.66		11.34			13.00		1.00	14.00			
10/10/96	2.00	-1.00		1.00			8.00			8.00			
10/11/96	16.00	-3.50	1.00	13.50			12.00		2.00	14.00			
Weekly Totals				47.34	32.00	1.46				61.00	40.00	1.53	3%
10/14/96	7.00	-3.00		4.00			15.00		2.00	17.00			
10/15/96	17.00	-3.50		13.50			10.00			10.00			
10/16/96	13.00	-2.00		11.00			12.00		1.00	13.00			
10/17/96	11.0	-2.00		9.00			11.00			11.00			
10/18/96	13.00	-2.00	1.00	12.00			8.00			8.00			
Weekly Totals				49.50	40.00	1.24				59.00	40.00	1.48	19%
Totals				328.88	362.50	0.91				602.48	408.00	1.48	63%

Driver Productivity Data

Year	1996						1997						
Driver	168						168						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	3.00			3.00			5.00		1.00	6.00			
7/23/96	2.00			2.00			5.00		1.00	6.00			
7/24/96	3.00			3.00			5.00		1.00	6.00			
7/25/96	8.00			8.00			5.00		1.00	6.00			
7/26/96	3.00			3.00			5.00		1.00	6.00			
Weekly Totals				19.00	40.50	0.47				30.00	40.00	0.75	60%
7/29/96	3.00			3.00			5.00		1.00	6.00			
7/30/96	3.00			3.00			5.00		1.00	6.00			
7/31/96	4.00			4.00			6.00		1.00	7.00			
8/1/96	2.00			2.00			5.00		1.00	6.00			
8/2/96	2.00			2.00			5.00		1.00	6.00			
Weekly Totals				14.00	33.00	0.42				31.00	40.00	0.78	83%
8/19/96	2.00			2.00			10.00		1.00	11.00			
8/20/96	2.00			2.00			15.00		1.00	16.00			
8/21/96	3.00			3.00			6.00		1.00	7.00			
8/22/96	3.00	-0.67		2.33			7.00		1.00	8.00			
8/23/96	2.00			2.00			7.00		1.00	8.00			
Weekly Totals				11.33	40.50	0.28				50.00	40.00	1.25	347%
8/26/96	2.00			2.00			7.00		1.00	8.00			
8/27/96	2.00			2.00			7.00		1.00	8.00			
8/28/96	3.00			3.00			5.00			5.00			
8/29/96	2.00			2.00			2.00			2.00			
8/30/96	2.00			2.00			2.00			2.00			
Weekly Totals				11.00	32.50	0.34				25.00	18.00	1.56	362%
9/2/96	2.00			2.00			0.00			0.00			
9/3/96	2.00			2.00			6.00		1.00	7.00			
9/4/96	3.00			3.00			6.00		1.00	7.00			
9/5/96	2.00			2.00			6.00		1.00	7.00			
9/6/96	2.00			2.00			6.00		1.00	7.00			
Weekly Totals				11.00	40.25	0.27				28.00	32.00	0.88	220%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	2.00			2.00			6.00		1.00	7.00			
9/10/96	2.00			2.00			6.00		1.00	7.00			
9/11/96	3.00			3.00			7.00		1.00	8.00			
9/12/96	2.00			2.00			7.00		1.00	8.00			
9/13/96	2.00			2.00			7.00		1.00	8.00			
Weekly Totals				11.00	41.00	0.27				38.00	40.00	0.95	254%
9/16/96	2.00			2.00			7.00		1.00	8.00			
9/17/96	2.00			2.00			5.00			5.00			
9/18/96	3.00			3.00			7.00		1.00	8.00			
9/19/96	2.00			2.00			6.00		1.00	7.00			
9/20/96	2.00			2.00			6.00		1.00	7.00			
Weekly Totals				11.00	41.00	0.27				35.00	40.00	0.89	226%
9/23/96	2.00			2.00			6.00		1.00	7.00			
9/24/96	2.00			2.00			7.00		1.00	8.00			
9/25/96	4.00			4.00			7.00		1.00	8.00			
9/26/96	3.00			3.00			6.00		1.00	7.00			
9/27/96	3.00			3.00			6.00		1.00	7.00			
Weekly Totals				14.00	41.00	0.34				37.00	40.00	0.93	171%
9/30/96	3.00			3.00			8.00			8.00			
10/1/96	4.00			4.00			9.00			9.00			
10/2/96	3.00			3.00			10.00			10.00			
10/3/96	3.00			3.00			10.00			10.00			
10/4/96	3.00			3.00			11.00			11.00			
Weekly Totals				16.00	19.00	0.64				49.00	40.00	1.23	45%
10/7/96	3.00			3.00			12.00			12.00			
10/8/96	1.00			1.00			10.00			10.00			
10/9/96	0.00			0.00			11.00			11.00			
10/10/96	0.00			0.00			11.00			11.00			
10/11/96	3.00			3.00			11.00			11.00			
Weekly Totals				70.00	32.00	0.22				55.00	40.00	1.38	529%
10/14/96	1.00			1.00			2.00			2.00			
10/15/96	3.00			3.00			11.00			11.00			
10/16/96	3.00			3.00			9.00			9.00			
10/17/96	3.00			3.00			9.00			9.00			
10/18/96	3.00			3.00			11.00			11.00			
Weekly Totals				13.00	40.00	0.33				42.00	40.00	1.05	223%
Totals				138.33	400.75	0.35				420.00	408.00	1.03	198%

Driver Productivity Data

Year	1996						1997						
Driver	172						172						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	4.00	-0.50		3.50			10.00		4.00	14.00			
7/23/96	4.00	-0.50		3.50			13.00		4.00	17.00			
7/24/96	4.00			4.00			11.00		4.00	15.00			
7/25/96	6.00	-0.50		5.50			12.00		4.00	16.00			
7/26/96	4.00	-0.50		3.50			9.00		4.00	13.00			
Weekly Totals				20.00	37.50	0.53				75.00	32.00	2.34	339%
7/29/96	4.00	-0.50		3.50			10.00		4.00	14.00			
7/30/96	5.00	-0.50		4.50			10.00		4.00	14.00			
7/31/96	4.00	-0.67		3.33			15.00		4.00	19.00			
8/1/96	6.00	-0.50		5.50			12.00		4.00	16.00			
8/2/96	5.00	-0.50		4.50			11.00		4.00	15.00			
Weekly Totals				21.33	37.50	0.57				78.00	40.00	1.95	243%
8/19/96	4.00	-0.50		3.50			12.00		4.00	16.00			
8/20/96	5.00	-0.50		4.50			16.00	-0.66		15.34			
8/21/96	4.00	-0.50		3.50			14.00		4.00	18.00			
8/22/96	6.00	-0.50		5.50			15.00		4.00	19.00			
8/23/96	5.00	-0.50		4.50			15.00		4.00	19.00			
Weekly Totals				21.50	37.00	0.58				87.34	40.00	2.18	276%
8/26/96	3.00			3.00			14.00	-0.50	4.00	17.50			
8/27/96	4.00			4.00			16.00		4.00	20.00			
8/28/96	3.00			3.00			15.00		2.00	17.00			
8/29/96	6.00	-0.50		5.50			11.00		4.00	15.00			
8/30/96	5.00	-0.50		4.50			11.00		4.00	15.00			
Weekly Totals				20.00	38.50	0.52				84.50	40.00	2.11	307%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	5.00	-0.50		4.50			12.00	-1.50	1.00	11.50			
9/4/96	4.00	-0.50		3.50			11.00	-1.00	1.00	10.00			
9/5/96	6.00	-0.50		5.50			14.00		2.00	16.00			
9/6/96	3.00			3.00			12.00		1.00	13.00			
Weekly Totals				16.50	37.50	0.44				50.50	32.00	1.58	259%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	3.00			3.00			10.00		4.00	14.00			
9/10/96	5.00	-0.50		4.50			9.00		4.00	13.00			
9/11/96	4.00	-0.67		3.33			9.00		4.00	13.00			
9/12/96	6.00	-0.50		5.50			11.00	-1.00	4.00	14.00			
9/13/96	6.00	-0.50		5.50			12.00		4.00	16.00			
Weekly Totals				21.83	37.50	0.58				70.00	40.00	1.75	201%
9/16/96	5.00	-0.50		4.50			17.00	-1.00	1.00	17.00			
9/17/96	6.00	-0.50		5.50			12.00	-1.00	1.00	12.00			
9/18/96	5.00	-0.50		4.50			13.00	-0.50	1.00	13.50			
9/19/96	7.00	-0.50		6.50			10.00		4.00	14.00			
9/20/96	8.00	-0.50		5.50			14.00		4.00	18.00			
Weekly Totals				26.50	37.50	0.71				74.50	39.00	1.91	170%
9/23/96	5.00	-0.50		4.50			14.00		4.00	18.00			
9/24/96	6.00	-0.50		5.50			15.00		4.00	19.00			
9/25/96	5.00	-0.50		4.50			17.00		4.00	21.00			
9/26/96	7.00	-0.50		6.50			7.00		3.00	10.00			
9/27/96	6.00	-0.50		5.50			12.00		4.00	16.00			
Weekly Totals				26.50	32.50	0.82				84.00	24.00	3.50	329%
9/30/96	18.00	-2.34	1.33	16.99			0.00		0.00	0.00			
10/1/96	20.00	-3.34	1.33	17.99			0.00		0.00	0.00			
10/2/96	14.00	-2.84	3.33	14.49			9.00		1.00	10.00			
10/3/96	15.00	-2.34	1.33	13.99			13.00		4.00	17.00			
10/4/96	15.00	-2.91	1.33	13.42			13.00		4.00	17.00			
Weekly Totals				76.88	30.00	2.56				44.00	24.00	1.63	-28%
10/7/96	15.00	-1.17	1.00	0.00			17.00		4.00	21.00			
10/8/96	16.00	-0.67	1.33	0.00			14.00		4.00	18.00			
10/9/96	19.00	-3.51	1.33	0.00			15.00	-0.50	4.00	18.50			
10/10/96	18.00	-1.17	1.33	0.00			14.00		4.00	18.00			
10/11/96	14.00	-0.67	1.33	0.00			17.00		4.00	21.00			
Weekly Totals				0.00	0.00	0.00				86.50	40.00	2.41	0%
10/14/96	5.00	-1.34		3.86			15.00		4.00	19.00			
10/15/96	4.00			4.00			17.00		4.00	21.00			
10/16/96	5.00		1.00	6.00			18.00		4.00	22.00			
10/17/96	6.00		1.00	7.00			15.00		4.00	19.00			
10/18/96	4.00		1.00	5.00			18.00		4.00	22.00			
Weekly Totals				25.66	40.00	0.64				103.00	40.00	2.58	301%
Totals				276.70	365.50	0.76				847.34	391.00	2.17	186%

Driver Productivity Data

Year	1996						1997						
Driver	180						180						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	15.00	-0.50	3.00	17.50			12.00		1.00	13.00			
7/23/96	13.00	-0.50	3.00	15.50			10.00		2.00	12.00			
7/24/96	11.00	-0.50	2.00	12.50			8.00		2.00	10.00			
7/25/96	11.00	-0.50	2.00	12.50			9.00		2.00	11.00			
7/26/96	16.00	-0.50	3.00	18.50			11.00		2.00	13.00			
Weekly Totals				76.50	39.25	1.95				59.00	40.00	1.48	-24%
7/29/96	14.00	-0.50	3.00	16.50			13.00		1.00	14.00			
7/30/96	11.00	-0.50	2.00	12.50			9.00		1.00	10.00			
7/31/96	13.00	-0.50	3.00	15.50			8.00		2.00	10.00			
8/1/96	10.00		3.00	13.00			6.00		2.00	8.00			
8/2/96	15.00	-0.50	2.00	16.50			9.00		2.00	11.00			
Weekly Totals				74.00	41.50	1.78				53.00	41.75	1.27	-28%
8/19/96	18.00	-0.50	2.00	19.50			13.00		2.00	15.00			
8/20/96	10.00		2.00	12.00			8.00		1.00	9.00			
8/21/96	12.00	-0.50	3.00	14.50			13.00		2.00	15.00			
8/22/96	12.00		2.00	14.00			7.00		1.00	8.00			
8/23/96	16.00		2.00	18.00			9.00			9.00			
Weekly Totals				78.00	39.75	1.99				56.00	41.00	1.37	-31%
8/26/96	15.00	-0.85	2.00	16.15			11.00		2.00	13.00			
8/27/96	10.00		2.00	12.00			8.00			8.00			
8/28/96	15.00		3.00	18.00			8.00		2.00	10.00			
8/29/96	11.00	-0.50	2.00	12.50			8.00			8.00			
8/30/96	12.00	-0.50	3.00	14.50			6.00		1.00	7.00			
Weekly Totals				73.15	32.75	2.23				46.00	40.00	1.15	-49%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	16.00	-0.50	2.00	17.50			10.00	-0.50	2.00	11.50			
9/4/96	14.00		2.00	16.00			10.00		2.00	12.00			
9/5/96	16.00		3.00	19.00			8.00		2.00	10.00			
9/6/96	11.00		2.00	13.00			9.00		1.00	10.00			
Weekly Totals				65.50	41.00	1.60				43.50	35.00	1.24	-22%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	15.00		3.00	18.00			17.00		1.00	18.00			
9/10/96	15.00	-0.50	2.00	16.50			12.00		1.00	13.00			
9/11/96	15.00	-0.50	2.00	16.50			9.00	-0.50	2.00	10.50			
9/12/96	12.00	-0.50	3.00	14.50			11.00		1.00	12.00			
9/13/96	12.00		2.00	14.00			14.00		2.00	16.00			
Weekly Totals				79.50	38.75	2.05				69.50	44.25	1.57	-23%
9/16/96	17.00		2.00	19.00			14.00		1.00	15.00			
9/17/96	14.00	-0.50	3.00	16.50			10.00		1.00	11.00			
9/18/96	13.00	-0.50	2.00	14.50			9.00		1.00	10.00			
9/19/96	11.00	-0.50	**2.00**	12.50			11.00		2.00	13.00			
9/20/96	11.00	-0.50	3.00	13.50			10.00			10.00			
Weekly Totals				76.00	38.25	1.99				59.00	43.75	1.35	-32%
9/23/96	16.00	-0.50	3.00	18.50			11.00		1.00	12.00			
9/24/96	9.00	-0.50	2.00	10.50			10.00		1.00	11.00			
9/25/96	12.00	-0.50	2.00	13.50			8.00		2.00	10.00			
9/26/96	14.00	-0.50	**2.00**	15.50			7.00		2.00	9.00			
9/27/96	12.00	-0.50	2.00	13.50			11.00		1.00	12.00			
Weekly Totals				71.50	38.25	1.87				54.00	41.50	1.30	-30%
9/30/96	16.00			16.00			13.00		2.00	15.00			
10/1/96	8.00		2.00	10.00			11.00		2.00	13.00			
10/2/96	12.00		1.00	13.00			9.00		2.00	11.00			
10/3/96	10.00			10.00			8.00		2.00	10.00			
10/4/96	12.00		1.00	13.00			12.00		2.00	14.00			
Weekly Totals				62.00	40.00	1.55				63.00	45.50	1.38	-11%
10/7/96	0.00			0.00			13.00			13.00			
10/8/96	0.00			0.00			8.00		1.00	9.00			
10/9/96	0.00			0.00			10.00		1.00	11.00			
10/10/96	0.00			0.00			9.00			9.00			
10/11/96	0.00			0.00			10.00		2.00	12.00			
Weekly Totals				0.00	0.00	0.00				54.00	46.00	1.17	0%
10/14/96	7.00	-0.50		6.50			4.00		2.00	6.00			
10/15/96	14.00		2.00	16.00			11.00			11.00			
10/16/96	7.00		1.00	8.00			11.00			11.00			
10/17/96	10.00		1.00	11.00			9.00			9.00			
10/18/96	9.00		2.00	11.00			6.00			6.00			
Weekly Totals				52.50	39.00	1.35				43.00	48.50	0.89	-34%
Totals				708.65	388.00	1.83				600.00	467.25	1.28	-30%

Driver Productivity Data

Year	1996						1997						
Driver	185						185						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	10.00			10.00			13.00			13.00			
7/23/96	11.00	-0.50	1.00	11.50			13.00			13.00			
7/24/96	12.00	-1.00		11.00			14.00		1.00	15.00			
7/25/96	12.00	-0.50	1.00	12.50			13.00			13.00			
7/26/96	9.00	-0.50		8.50			11.00			11.00			
Weekly Totals				53.50	55.00	0.97				65.00	40.00	1.63	67%
7/29/96	13.00	-1.95		11.05			13.00			13.00			
7/30/96	9.00	-0.50	1.00	9.50			13.00			13.00			
7/31/96	12.00	-0.50		11.50			14.00		1.00	15.00			
8/1/96	11.00		1.00	12.00			13.00			13.00			
8/2/96	9.00	-0.50		8.50			11.00			11.00			
Weekly Totals				52.55	50.50	1.04				65.00	40.00	1.63	58%
8/19/96	12.00	-1.00		11.00			13.00		1.00	14.00			
8/20/96	11.00		1.00	12.00			13.00			13.00			
8/21/96	12.00	-0.50		11.50			15.00		1.00	16.00			
8/22/96	11.00		1.00	12.00			13.00			13.00			
8/23/96	9.00			9.00			11.00			11.00			
Weekly Totals				55.50	55.00	1.01				67.00	40.00	1.68	66%
8/26/96	12.00	-1.00		11.00			13.00			13.00			
8/27/96	11.00	-0.50	1.00	11.50			13.00		1.00	14.00			
8/28/96	12.00	-1.00		11.00			14.00			14.00			
8/29/96	12.00	-0.50	1.00	12.50			13.00		1.00	14.00			
8/30/96	9.00	-0.50		8.50			11.00			11.00			
Weekly Totals				54.50	40.00	1.36				66.00	40.00	1.65	21%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	12.00	-0.50	1.00	12.50			15.00	-0.50	1.00	15.50			
9/4/96	12.00			12.00			16.00			16.00			
9/5/96	11.00		1.00	12.00			14.00		1.00	15.00			
9/6/96	7.00			7.00			11.00			11.00			
Weekly Totals				43.50	38.00	1.21				57.50	32.00	1.80	49%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	10.00	-1.00		9.00			13.00			13.00			
9/10/96	10.00	-0.50	1.00	10.50			13.00		1.00	14.00			
9/11/96	11.00	-1.00		10.00			15.00			15.00			
9/12/96	10.00	-0.50	1.00	10.50			13.00		1.00	14.00			
9/13/96	8.00	-0.50		7.50			11.00			11.00			
Weekly Totals				47.50	28.00	1.70				67.00	40.00	1.68	-1%
9/16/96	10.00	-1.00		9.00			13.00			13.00			
9/17/96	10.00	-0.33	2.00	11.67			14.00		1.00	15.00			
9/18/96	11.00	-0.50		10.50			15.00			15.00			
9/19/96	10.00	-0.50	1.00	10.50			13.00		1.00	14.00			
9/20/96	8.00	-0.50		7.50			11.00			11.00			
Weekly Totals				49.17	27.00	1.82				68.00	32.00	2.13	17%
9/23/96	10.00	-1.00		9.00			14.00			14.00			
9/24/96	10.00	-0.50	1.00	10.50			14.00		1.00	15.00			
9/25/96	11.00	-1.00		10.00			14.00			14.00			
9/26/96	10.00	-0.50	1.00	10.50			14.00		1.00	15.00			
9/27/96	8.00	-0.50		7.50			18.00			18.00			
Weekly Totals				47.50	30.00	1.58				76.00	32.00	2.38	50%
9/30/96	9.00	-0.50		0.00			16.00	-1.50	1.00	15.50			
10/1/96	9.00	-0.50	1.00	0.00			16.00			16.00			
10/2/96	11.00	-0.50		0.00			14.00		1.00	15.00			
10/3/96	8.00	-0.50		0.00			13.00			13.00			
10/4/96	1.00			0.00			11.00			11.00			
Weekly Totals				0.00	0.00	0.00				70.50	41.00	1.72	0%
10/7/96	0.00			0.00			13.00		1.00	14.00			
10/8/96	0.00			0.00			14.00			14.00			
10/9/96	0.00			0.00			14.00		1.00	15.00			
10/10/96	0.00			0.00			14.00			14.00			
10/11/96	0.00			0.00			12.00			12.00			
Weekly Totals				0.00	0.00	0.00				69.00	40.00	1.73	0%
10/14/96	0.00			0.00			1.00		1.00	1.00			
10/15/96	7.00	-0.50		0.00			14.00			14.00			
10/16/96	1.00	-0.50		0.00			15.00		1.00	16.00			
10/17/96	0.00	-0.50		0.00			14.00			14.00			
10/18/96	0.00	-0.50		0.00			12.00			12.00			
Weekly Totals				0.00	0.00	0.00				57.00	32.00	1.78	0%
Totals				403.72	321.50	1.26				728.00	489.00	1.78	42%

Driver Productivity Data

Year	1996						1997						
Driver	186						186						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	10.00		1.00	11.00			13.00	none	2.00	15.00			
7/23/96	14.00		2.00	16.00			18.00		3.00	21.00			
7/24/96	14.00		1.00	15.00			17.00		2.00	19.00			
7/25/96	13.00		1.00	14.00			17.00		2.00	19.00			
7/26/96	11.00		2.00	13.00			14.00		3.00	17.00			
Weekly Totals				69.00	34.25	2.01				91.00	41.75	2.18	8%
7/29/96	10.00		1.00	11.00			13.00		2.00	15.00			
7/30/96	14.00		2.00	16.00			18.00		3.00	21.00			
7/31/96	14.00		1.00	15.00			17.00		2.00	19.00			
8/1/96	13.00		1.00	14.00			17.00		2.00	19.00			
8/2/96	11.00		2.00	13.00			14.00		3.00	17.00			
Weekly Totals				69.00	34.25	2.01				91.00	41.75	2.18	8%
8/19/96	11.00		1.00	12.00			13.00		2.00	15.00			
8/20/96	14.00		2.00	16.00			18.00		3.00	21.00			
8/21/96	15.00		1.00	16.00			17.00		2.0	19.00			
8/22/96	13.00		1.00	14.00			4.00		1.00	5.00			
8/23/96	11.00		2.00	13.00			14.00		3.00	17.00			
Weekly Totals				71.00	34.25	2.07				77.00	36.75	2.10	1%
8/26/96	11.00		1.00	12.00			13.00		2.00	15.00			
8/27/96	14.00		2.00	16.00			18.00		3.00	21.00			
8/28/96	15.00		1.00	16.00			17.00		2.00	19.00			
8/29/96	13.00		1.00	14.00			17.00		2.00	19.00			
8/30/96	11.00		2.00	13.00			13.00		3.00	16.00			
Weekly Totals				71.00	27.50	2.58				90.00	41.75	2.16	-17%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	15.00		2.00	17.00			18.00		3.00	21.00			
9/4/96	15.00		1.00	16.00			17.00		2.00	19.00			
9/5/96	13.00		1.00	14.00			17.00		2.00	19.00			
9/6/96	12.00		2.00	14.00			14.00		3.00	17.00			
Weekly Totals				61.00	27.50	2.22				76.00	33.75	2.25	2%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	10.00		1.00	11.00			0.00			0.00			
9/10/96	14.00		2.00	16.00			0.00			0.00			
9/11/96	14.00		1.00	15.00			0.00			0.00			
9/12/96	0.00			0.00			0.00			0.00			
9/13/96	11.00		2.00	13.00			0.00			0.00			
Weekly Totals				55.00	34.25	1.81				0.00	0.00	0.00	0%
9/16/96	11.00		1.00	12.00			13.00		2.00	15.00			
9/17/96	15.00		2.00	17.00			18.00		3.00	21.00			
9/18/96	15.00		1.00	16.00			17.00		2.00	19.00			
9/19/96	13.00		1.00	14.00			17.00		2.00	19.00			
9/20/96	11.00		2.00	13.00			14.00		3.00	17.00			
Weekly Totals				72.00	34.25	2.10				91.00	41.75	2.18	4%
9/23/96	11.00		1.00	12.00			13.00		2.00	15.00			
9/24/96	14.00		2.00	16.00			18.00		3.00	21.00			
9/25/96	15.00		1.00	16.00			17.00		2.00	19.00			
9/26/96	13.00		1.00	14.00			17.00		2.00	19.00			
9/27/96	11.00		2.00	13.00			15.00		3.00	18.00			
Weekly Totals				71.00	41.75	1.70				92.00	41.75	2.20	30%
9/30/96	12.00	-1.67	1.00	11.33			13.00		2.00	15.00			
10/1/96	14.00	-2.67	2.00	13.33			19.00		3.00	22.00			
10/2/96	15.00	-2.17	1.00	13.83			17.00		2.00	19.00			
10/3/96	13.00	-2.17	1.00	11.83			17.00		2.00	19.00			
10/4/96	11.00	-2.83	2.00	10.17			14.00		3.00	17.00			
Weekly Totals				60.49	41.75	1.45				92.00	41.75	2.20	52%
10/7/96	15.00	-3.66	1.00	12.34			13.00		2.00	15.00			
10/8/96	17.00	-4.00	2.00	15.00			18.00		3.00	21.00			
10/9/96	14.00	-3.33	1.00	11.67			17.00		2.00	19.00			
10/10/96	16.00	-1.00	1.00	16.00			16.00		2.00	18.00			
10/11/96	13.00	-3.50	2.00	11.50			13.00		3.00	16.00			
Weekly Totals				66.51	41.75	1.59				89.00	41.75	2.13	34%
10/14/96	10.00	-3.00		7.00			5.00		3.00	8.00			
10/15/96	19.00	-3.50	2.00	17.50			18.00		2.00	20.00			
10/16/96	16.00	-2.00	1.00	15.00			17.00		2.00	19.00			
10/17/96	16.00	-2.00	1.00	15.00			17.00		2.00	19.00			
10/18/96	13.00	-2.00	2.00	13.00			13.00		3.00	16.00			
Weekly Totals				67.50	41.75	1.62				82.00	41.75	1.96	21%
Totals				733.50	393.25	1.87				871.00	404.50	2.15	15%

Driver Productivity Data

Year	1996						1997						
Driver	188						188						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	0.00			0.00			1.00	None	None	1.00			
7/23/96	0.00			0.00			2.00			2.00			
7/24/96	3.00			3.00			3.00			3.00			
7/25/96	1.00		1.00	2.00			1.00			1.00			
7/26/96	0.00			0.00			3.00			3.00			
Weekly Totals				5.00	32.25	0.16				10.00	30.00	0.33	115%
7/29/96	0.00			0.00			4.00	none	None	4.00			
7/30/96	0.00			0.00			5.00			5.00			
7/31/96	0.00			0.00			4.00			4.00			
8/1/96	3.00		1.00	4.00			3.00			3.00			
8/2/96	2.00			2.00			5.00			5.00			
Weekly Totals				6.00	43.00	0.14				21.00	40.00	0.53	276%
8/19/96	2.00			2.00			4.00			4.00			
8/20/96	1.00			1.00			3.00	-1.00		2.00			
8/21/96	1.00			1.00			6.00			6.00			
8/22/96	1.00			1.00			3.00			3.00			
8/23/96	1.00			1.00			3.00			3.00			
Weekly Totals				6.00	36.75	0.16				18.00	40.75	0.44	171%
8/26/96	0.00			0.00			3.00	none	None	3.00			
8/27/96	3.00			3.00			3.00			3.00			
8/28/96	0.00			0.00			4.00			4.00			
8/29/96	2.00		1.00	3.00			6.00			6.00			
8/30/96	5.00			5.00			4.00			4.00			
Weekly Totals				11.00	33.00	0.33				20.00	41.50	0.48	45%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	3.00			3.00			6.00	-1.00		5.00			
9/4/96	2.00			2.00			1.00			1.00			
9/5/96	3.00		1.00	4.00			4.00			4.00			
9/6/96	4.00			4.00			3.00			3.00			
Weekly Totals				13.00	15.50	0.84				13.00	26.25	0.50	-41%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/9/96	0.00			0.00			7.00			7.00			
9/10/96	0.00			0.00			2.00			2.00			
9/11/96	0.00			0.00			4.00			4.00			
9/12/96	1.00		1.00	2.00			3.00	-0.50		2.50			
9/13/96	2.00			2.00			5.00			5.00			
Weekly Totals				4.00	40.25	0.10				20.50	39.50	0.52	422%
9/16/96	2.00			2.00			1.00	None	None	1.00			
9/17/96	3.00			3.00			3.00			3.00			
9/18/96	3.00			3.00			4.00			4.00			
9/19/96	3.00		1.00	4.00			3.00			3.00			
9/20/96	2.00		2.00	0.00			2.00			2.00			
Weekly Totals				12.00	38.00	0.32				13.00	32.50	0.40	27%
9/23/96	2.00			2.00			2.00	None	None	2.00			
9/24/96	3.00			2.00			5.00			5.00			
9/25/96	3.00			2.00			5.00			5.00			
9/26/96	3.00	-0.50	1.00	3.50			3.00			3.00			
9/27/96	0.00			0.00			4.00			4.00			
Weekly Totals				9.50	39.00	0.24				19.00	32.00	0.59	144%
9/30/96	2.00			2.00			4.00	None	None	4.00			
10/1/96	1.00			1.00			4.00			4.00			
10/2/96	4.00			4.00			3.00			3.00			
10/3/96	2.00			2.00			4.00			4.00			
10/4/96	1.00			1.00			4.00			4.00			
Weekly Totals				10.00	41.25	0.24				19.00	40.75	0.47	92%
10/7/96	4.00			4.00			3.00	-0.50		3.00			
10/8/96	4.00			4.00			3.00	-0.50		2.50			
10/9/96	4.00			4.00			4.00			2.50			
10/10/96	5.00			5.00			3.00			3.00			
10/11/96	5.00			5.00			4.00			4.00			
Weekly Totals				22.00	26.50	0.83				16.00	40.50	0.40	-52%
10/14/96	0.00			0.00			0.00	None	None	0.00			
10/15/96	4.00	-0.50		3.50			3.00			3.00			
10/16/96	4.00			4.00			5.00			5.00			
10/17/96	4.00		1.00	5.00			2.00			2.00			
10/18/96	6.00	-1.32		4.68			2.00			2.00			
Weekly Totals				17.18	41.25	0.42				12.00	33.75	0.36	-15%
Totals				115.68	386.75	0.30				181.50	397.50	0.46	53%

Driver Productivity Data

Year	1996						1997						
Driver	193						193						
Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
7/22/96	4.00	none	none	4.00			7.00	none	None	7.00			
7/23/96	4.00			4.00			8.00			8.00			
7/24/96	0.00			0.00			9.00			9.00			
7/25/96	5.00			5.00			7.00			7.00			
7/26/96	8.00			8.00			10.00			10.00			
Weekly Totals				21.00	35.00	0.60				41.00	24.50	1.67	179%
7/29/96	8.00			8.00			8.00			8.00			
7/30/96	6.00			6.00			7.00			7.00			
7/31/96	4.00			4.00			7.00			7.00			
8/1/96	5.00			5.00			6.00			6.00			
8/2/96	5.00			5.00			8.00			8.00			
Weekly Totals				28.00	35.00	0.80				36.00	41.00	0.88	10%
8/19/96	4.00			4.00			9.00			9.00			
8/20/96	5.00			5.00			15.00			15.00			
8/21/96	5.00			5.00			11.00			11.00			
8/22/96	5.00			5.00			8.00			8.00			
8/23/96	5.00			5.00			8.00			8.00			
Weekly Totals				24.00	35.00	0.69				51.00	40.00	1.28	86%
8/26/96	5.00			5.00			8.00			8.00			
8/27/96	5.00			5.00			9.00			9.00			
8/28/96	5.00			5.00			9.00			9.00			
8/29/96	5.00			5.00			7.00			7.00			
8/30/96	5.00			5.00			9.00			9.00			
Weekly Totals				25.00	26.00	0.69				33.00	41.50	0.80	-11%
9/2/96	0.00			0.00			0.00			0.00			
9/3/96	5.00			5.00			9.00			9.00			
9/4/96	5.00			5.00			9.00			9.00			
9/5/96	5.00			5.00			8.00			8.00			
9/6/96	5.00			5.00			7.00			7.00			
Weekly Totals				20.00	35.00	0.57				33.00	33.00	1.00	75%
9/9/96	5.00			5.00			8.00			8.00			
9/10/96	5.00			5.00			9.00			9.00			
9/11/96	5.00			5.00			8.00			8.00			
9/12/96	5.00			5.00			8.00			8.00			
9/13/96	4.00			4.00			0.00			0.00			
Weekly Totals				24.00	14.00	1.71				33.00	32.50	1.02	-41%

Driver Productivity Data

Date	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Deliver	Splits	Rd. Trips	Rev. Del.	Hours	Prodcty	Change
9/16/96	5.00			5.00			8.00			8.00			
9/17/96	5.00			5.00			9.00			9.00			
9/18/96	5.00			5.00			8.00			8.00			
9/19/96	4.00			4.00			6.00			6.00			
9/20/96	4.00			4.00			9.00			9.00			
Weekly Totals				23.00	35.00	0.66				40.00	43.00	0.93	42%
9/23/96	5.00			5.00			8.00			8.00			
9/24/96	5.00			5.00			8.00			8.00			
9/25/96	5.00			5.00			7.00			7.00			
9/26/96	5.00			5.00			7.00			7.00			
9/27/96	5.00			5.00			19.00			19.00			
Weekly Totals				25.00	38.75	0.86				49.00	43.00	1.14	77%
9/30/96	13.00	-0.50		12.50			8.00	-0.72		7.28			
10/1/96	14.00	-0.50	1.00	14.50			13.00			13.00			
10/2/96	9.00	-1.00	1.00	9.00			9.00			9.00			
10/3/96	11.00	-0.50	1.00	11.50			8.00			8.00			
10/4/96	8.00	-0.50	1.00	8.50			7.00			7.00			
Weekly Totals				56.00	38.75	1.45				44.28	43.25	1.02	-29%
10/7/96	10.00	-0.50	1.00	10.50			7.00			7.00			
10/8/96	11.00	-0.50	1.00	11.50			10.00			10.00			
10/9/96	8.00		1.00	9.00			7.00			7.00			
10/10/96	12.00	-0.50	1.00	12.50			8.00			8.00			
10/11/96	7.00	-0.50	1.00	7.50			7.00			7.00			
Weekly Totals				51.00	40.00	1.26				39.00	40.00	0.98	-24%
10/14/96	8.00	-1.32		6.68			0.00			0.00			
10/15/96	11.00	-0.50	1.00	11.50			10.00			10.00			
10/16/96	7.00	-0.50	1.00	7.50			8.00			8.00			
10/17/96	11.00	-0.50	1.00	11.50			9.00			9.00			
10/18/96	7.00	-0.50	1.00	7.50			6.00			6.00			
Weekly Totals				44.68	38.50	1.16				33.00	33.00	1.00	-14%
Totals				341.68	373.00	0.92				432.28	414.75	1.04	14%

Driver Productivity Data

Year	1996		1997										
Total Prodcty	16.66		20.77										
Change	24%												

Driver Productivity Data

Date				Rev. Del.	Hours	Prodcty				Rev. Del.	Hours	Prodcty	Change
Totals				605.64	442.50	1.37				522.14	462.50	1.13	-185%
Totals				114.00	408.00	0.28				176.00	408.00	0.43	54%
Totals				595.33	395.00	1.51				796.85	408.00	1.95	30%
Totals				900.00	265.25	2.19				922.26	340.25	2.71	24%
Totals				493.64	520.50	0.95				243.00	314.00	0.77	-18%
Totals				905.50	418.00	2.17				921.00	384.00	2.40	11%
Totals				328.88	362.50	0.91				602.45	408.00	1.48	63%
Totals				138.33	400.75	0.35				420.00	408.00	1.03	198%
Totals				278.70	365.50	0.76				847.34	391.00	2.17	186%
Totals				708.65	388.00	1.83				600.00	467.25	1.28	-30%
Totals				403.72	321.50	1.26				728.00	409.00	1.78	42%
Totals				733.50	393.25	1.87				871.00	404.50	2.15	15%
Totals				115.68	386.75	0.30				181.50	397.50	0.46	53%
Totals				341.68	373.00	0.92				432.28	414.75	1.04	14%
				6,561.45	5,540.50	1.18427				8,263.82	5,616.75	1.47128	24%

Attachment E

Survey Instruments

Date: 2/26/97-2/28/97 Drivers: 14 resuondents

This survey is being conducted by George Mason University's Institute for Public Policy with Federal Highway Administration funds. Your cooperation is greatly appreciated.

1. a. Do you get traffic information from your system, meaning dispatchers or other drivers?

a. Yes	8
b. No	6
c. Don't know, not sure	0

b. If yes,

How?

Two-way radio	7
From dispatchers	1
Paging system	1
Other driver	1

Formally or informally?

Informal	6
Formal	2

How frequent?

Whenever an accident occurs	2
Depends on conditions	1
Whenever there is a traffic tie up	1
Several times a day but often not relevant	1
Two times a day	1
Everyday	1
Not often	1

2. What could dispatchers do to provide better traffic information?

They're fine	2
Nothing	2
Nothing because driver works at night	1
Don't know if they could	1
Listen to WTOP	1
Not their job	1
Hard to pick up dispatcher in Towson and Baltimore	1
Listen to the radio	1
Get drivers to communicate with dispatchers about traffic problems.	1
Notify more often about delays	1
Tie in with Metro traffic would help	1
Dispatchers would tell drivers more often about delays if drivers would report to dispatchers	1
Better communication between dispatchers and drivers	1

3. How do you communicate with dispatchers and other drivers?

Communication with dispatchers:	
Two-way radio	12
Paging systems	8
Regular phone	1
Cellular phones	1
Briefly when at headquarters	1
Communication with other drivers:	
Two-way radio	6
Paging system	2
Through dispatch	1
Cellular phone	1
Briefly when at headquarters	1
When at warehouse	1

4. How do you alert dispatchers and other drivers about delays?

Two-way radio with dispatcher	9
Two-way radio with drivers	7
Call dispatch, tell them about delay, and they relay it to drivers	3
Tell dispatchers, not other drivers	1
Cannot tell drivers	1
Call dispatchers on cellular phone, with one exception. When in Baltimore, driver contacts with a cell phone beeper at a certain spot at a certain time.	1

5. How do you handle information about traffic delays?

Choose an alternative route	8
Avoid the delay	2
Depends on the situation, if a faster alternative route exits	1
Listen to the information, if bad, relay	1
Make a decision depending on the advice given	1
Avoid it unless you have a better route	1

6. What communication devices have you been using in the car that you drive? (Choose all that apply)

a. Two-way radio	13
b. Pagers	14
c. Cellular Phone	4
d. Other:	
Listen to commercial radio for traffic reports	8
Listen to WTOP on radio	2
Listen to WMAC on radio	1
Scanners	1
CB's	1
Devices not in car:	
Telephone on the side of the road	1
Traffic signs on interstate	1

(Those who said two-way radios)
7. How helpful are two-way radios for avoiding traffic congestion? Would you say that these devices are helpful, neither helpful nor harder, or harder?

a. Helpful	11
b. Neither helpful nor harder	1
c. Harder	1

(Those who said pagers)
8. How helpful are pagers for avoiding traffic congestion? Would you say that these devices are helpful, neither helpful nor harder, or harder?

a. Helpful	7
b. Neither helpful nor harder	6
c. Harder	1

(Those who said cellular phones)
9. How helpful are cellular phones for avoiding traffic congestion? Would you say that these devices are helpful, neither helpful nor harder, or harder?

a. Helpful	2
b. Neither helpful nor harder	2
c. Harder	0

(Those who said other devices)
10. How helpful are other devices for avoiding traffic congestion? Would you say that these devices are helpful, neither helpful nor harder, or harder?

a. Helpful	11
b. Neither helpful nor harder	1
c. Harder	0

11. What could dispatchers do to provide better traffic information?

Nothing	5
Notify more often about delays	2
Being more detailed and specific	1
Listen to WTOP	1
Do what they are doing	1
Driver has a better view of area that he's traveling	1
Listen to commercial radio reports	1
Tie in with Metro traffic would help	1
Dispatchers would tell drivers more often about delays if drivers would report to dispatchers	1
Better communication between dispatchers and drivers	1

12. If dispatchers could provide exact routes for you to follow, would this information improve your work?

a. Yes	7
b. No	6
c. Don't know, not sure	1

13. Would you use the directions provided by the dispatchers?

a. Yes	8
b. No	4
c. Don't know, not sure	2

14. If no, why not?

Drivers know routes better than dispatchers.	3
Driver knows Fairfax county very well.	1

15. What roads should be typically avoided and when? (LIST FIVE)

Rush hour: I-66	4
Rush hour: Beltway	3
Rush hour: I-95	3
Rush hour: Woodrow Wilson Bridge	2
All of them	2
Rush hour: I-395, Route 1, 14th Street Bridge, Route 7, all roads in DC	1
NY Avenue-always, I-95 Springfield south during evening rush hour, Wisconsin Avenue-always	1
In the morning: I-395 and I-495	1

Factuals

1. Are you male or female?

a. Male	13
b. Female	1

2. How old are you?

a. 18-25	0	d.46-55	8
b. 26-35	0	e.56-65	1
c. 36-45	4	f. 66 and older	1

3. How long have you worked for this company?

a. Less than three months	0
b. Three to six months	0
c. Over six months but less than a year	0
d. Between 1 and 2 years	2
e. Two or more years	12

4. How long have you driven for this company?

a. Less than three months	0
b. Three to six months	0
c. Over six months but less than a year	0
d. Between 1 and 2 years	2
e. Two or more years	12

Post-Implementation Driver Survey

Date:_____ Driver Number_____

This survey is being conducted by George Mason University's Center for Transportation and Land Policy in The Institute of Public Policy, and constitutes a follow-up to the survey you participated in last Spring. Your cooperation is greatly appreciated.

1. Since Dispatch Tools has been implemented do you find that it is for you to avoid congestion?

a. Much easier
14/c b. Somewhat easier
c. No difference

2. Do you find that you are getting more timely information from dispatchers since Dispatch Tools has been implemented?

a. Yes
11/c b. No change
c. Don't know

Majority were unsure about "timeliness" of information.

3. Has your method of alerting other drivers about delays changed since Dispatch Tools has been implemented?

a. Yes
14/b b. No

4. If your answer to #3 was yes, in what way has it changed?

5. Has Dispatch Tools enabled you to make more deliveries per hour than before?

7/a a. Yes
2/b b. No
5/c c. Don't know

6. Overall, would you say that Dispatch Tools has been a good or bad thing for you?

a. Good
14/c b. Bad
c. Don't know

In what way?

7. Additional comments:

Date: 2/28/97 and 3/5/97 Dispatchers: 7 respondents

This survey is being conducted by George Mason University's Institute for Public Policy with Federal Highway Administration funds. Your cooperation is greatly appreciated.

1. a. Do you get traffic information from your system, meaning drivers or other dispatchers?

a. Yes	7
b. No	0
c. Don't know, not sure	0

b. If yes,

How?

Communication between drivers and dispatchers using two-way radios	5
Verbal communication among dispatchers	4
Drivers communicate to dispatchers by regular phone.	2
Relayed from drivers, dispatchers, and customer service	1
Dispatchers usually communicate verbally, but sometimes in written form.	1
Dispatchers overhears other dispatchers	1

Formally or informally?

Informal	7
Formal	0

How frequent?

Whenever there's a problem	4
Depending on weather conditions and the time of day	1
Depends on traffic and time of day	1
Infrequently	1

2. **What could drivers do to provide better traffic information?**

Being more specific as to where, when, or what the problem is	2
Nothing	2
Keep description of situation brief	1
Independent drivers are less willing to give information unless affecting them, but company drivers are usually very helpful about any problem.	1
Try to determine if a problem will last more than 5 minutes and whether to call them in; try to use value judgment if problem is major or minor	1
Drivers should communicate about problems not affecting them.	1
Keep us posted	1

3. Route optimization allows the dispatcher to find the best route between point A and point B. Using such a system, do you think that you would have time to give specific directions to every driver who needed them?

a. Yes	2
b. No	4
c. Don't know, not sure	1

4. Do you think that the drivers would follow your directions?

a. Yes	5
b. No	0
c. Don't know, not sure	0
Not originally offered: not always or not every driver	2

5. What roads should be typically avoided and when? (LIST FIVE)

Rush hour: I-66	3
Rush hour: I-395	2
Beltway between Cabin John Bridge and Route 50 between 3 pm-6 pm into MD; I-270 split to Tysons 7 am to 9 am into VA; Wilson Bridge into MD 3 pm-6 pm and 7 am-9 am into VA; avoid I-66 westbound 4 pm-7 pm; avoid I-66 eastbound 6 am-9:30 am; avoid I-395 southbound DC to Woodbridge 4 pm to 7 pm; every road at rush hour	1
Rush hour: I-95 outside the beltway south, Cabin John Bridge and Woodrow Wilson Bridge	1
Whitehurst Freeway-always, NY Avenue, NE, during rush hour, Woodrow Wilson Bridge when doing construction in the middle of the night	1
Tysons Corner 5 pm; I-95 and I-495 3 pm to 7 pm; Rockville Pike 3 pm to 7 pm	1
Avoid I-495 whenever possible	1
All roads during rush hour	1
Don't know	1

6. How do you communicate with drivers and other dispatchers?

Communication with drivers:	
Paging systems	6
Two-way radio	6
Regular phone	5
Cellular phones	2
Communication with other dispatchers:	
Talk to each other	7
Written messages	3
Paging system	1

7. How do you alert drivers and other dispatchers about delays?

Communication with drivers	
Two-way radio	6
Paging system	5
Regular phone	2
Cellular phone	1
General page out to the drivers	1
Communication with other dispatchers	
Verbal communication	7
Written notes	2
Paging system	1

8. How do you handle information about traffic delays?

Suggest alternative route	3
First, make a general announcement on the two-way radio; if a driver calls in on the phone and he's in the area, you'll let him know.	1
Announce it several times until traffic congestion is gone	1
Relay over two-way radio to drivers	1
Communicate with dispatchers in the office	1
Make an announcement "Be Advised"	1

9. How could your communication system be improved?

If we had GPS, so we'd know where all the vehicles are at any time.	1
More cooperation between incoming and outgoing information	1
More cooperation between drivers and dispatchers	1
Radios with a stronger signal to communicate over a large distance	1
Okay, other than finding drivers who know what they are doing	1
Need updated radio	1
More accurate information	1
Don't know	1

Factuals

1. Are you male or female?

a. Male
b. Female

2. How old are you?

a. 18-25	0	d.46-55	2
b. 26-35	1	e.56-65	0
c. 36-45	3	f. 66 and older	0

One respondent refused to pick a category and said that he was over 50.

3. How long have you worked for this company?

a. Less than three months	0
b. Three to six months	0
c. Over six months but less than a year	0
d. Between 1 and 2 years	0
e. Two or more years	7

4. How long have you dispatched for this company?

a. Less than three months	0
b. Three to six months	0
c. Over six months but less than a year	0
d. Between 1 and 2 years	0
e. Two or more years	7

Post-Implementation Dispatcher Survey

Date:_____ Dispatcher Number:_____

This survey is being conducted by George Mason University's Center for Transportation and Land Policy in The Institute of Public Policy, and constitutes a follow-up to the survey you participated in last Spring. Your cooperation is greatly appreciated.

1. Have you observed any changes in the communication process between you and drivers since Dispatch Tools has been implemented?

l/a a. Much improved
4/b b. Somewhat improved
l/c c. No change
d. Deteriorated

2. Has Dispatch Tools provided you with better information about traffic conditions? If yes in what way?

a. Yes
6/b b. No

a. More timely
_____ b. More accurate
c. Other (Explain)

3. Has Dispatch Tools had any negative effect on communication with drivers?

a. Yes (Explain)
6/b b. No

4. Has Dispatch Tools changed your method of informing drivers and other dispatchers about delays? Explain.

a. Yes
6/a b. No

According to the respondents the paging element in *Dispatch*Tools^{TM} facilitates communication with drivers.

5. Overall, has Dispatch Tools been a good thing for you? Explain on back.

5/a a. Yes
1/b b. No

Dispatchers found it easier to keep track of the fleet. They saw improved efficiency in the dispatching operation and better communication among dispatchers. They liked the multiple sorting and grouping options, but found the learning curve quite steep.