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REORGANIZATION OF A SMALL PACKAGE HANDLING SYSTEM AT A UNITED PARCEL SERVICE DISTRIBUTION FACILITY

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REORGANIZATION OF A SMALL PACKAGE HANDLING SYSTEM AT A UNITED PARCEL SERVICE DISTRIBUTION FACILITY

By

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ABSTRACT

REORGANIZATION OF A SMALL PACKAGE HANDLING SYSTEM AT A UNITED PARCEL SERVICE DISTRIBUTION FACILITY

By

James E. MacDonald

This thesis presents a case study of the reorganization of a package handling system for the United Parcel Service distribution center serving Aurora, Ohio and the northern territory of Akron. The explosive growth in small package volume during the 1980's had strained the effectiveness of the package sorting, handling, and distribution system. These problems associated with patch and mend fixes over a thirteen year period are analyzed. An area trace is developed using zip code boundaries in the town of Aurora. This area trace is used as a dispatching tool for management in order to minimize package sorting and handling, while maximizing the efficiency in the routing of drivers. The packages scheduled to be delivered within Aurora are dispatched to three drivers with daily variances in package volume.

Advisor: Dr. Gary Burgess

DEDICATION

This thesis is dedicated to my wife Laura, my son James V, my family and friends.

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CHAPTER 1: INTRODUCTION

The susceptibility to damage of a given package is directly related to the logistical environment the package is placed in. The design of a package should protect the product from any physical damage experienced whenever the package is in transit, warehoused, or handled. A company that integrates its own distribution of goods will have more control over the physical environment and would require less packaging as compared to the extra packaging required when shipping through a private or common carrier such as United Parcel Service. Packages which are designed to be palletized may not be sufficient for shipment by a small package carrier. Shippers who understand the movement of goods within U.P.S. should package accordingly. Claims are expensive for U.P.S. as they directly cut into profits. Claims are expensive for the shipper in that they do not provide their customer with a usable product.

United Parcel Service has two options to reduce claims: convince the shipper to spend more on packaging, or make the conveyors, vehicles, and package handling less hostile. U.P.S is actively pursuing both options but larger gains in claim reduction is possible by improving its internal system.

The purpose of this paper is to document a case study of the reorganization of a United Parcel Service distribution center. Predetermined package placement in the brown U.P.S. delivery vehicle based on daily fluctuations in volume is a key to minimizing package handling. This is performed by the "preload" function during the early morning hours before the drivers start.

Excessive package handling during the preload hours prior to

reorganizing resulted in high operating cost, inefficient dispatching of the drivers, and a decline in communication with the claims department. These problems are analyzed in detail.

Prior to reorganization, individual delivery areas were divided by geographical boundaries such as lakes, rivers, valleys, railroad tracks, etc. This provided an efficient means of package delivery but created the confusion in the "preload" operation that sorts the packages and loads the vehicle. Reorganizing the center involved using zip codes rather than geographical boundaries to separate delivery areas.

Once the zip code boundaries were used, developing the "area trace" and subsequent dispatching of drivers is analyzed. The study concludes by describing the process of training the "preloaders" to put a package for delivery in a designated spot in the drivers vehicle, based on efficient routing.

It is hoped that information resulting from this study may be used by any firm that is involved with dispatching of drivers or a sales force that may exhibit daily variances due to a rapidly changing work load.

Review

Packaging requirements are directly related to the.product's logistic system. The package should be designed to protect the product through the warehousing and distribution system. The objective of logistics is to deliver finished inventory, work-in-process inventory, and material assortments, when required, in usable condition, to the location where needed, at the lowest total cost. (Bowersox, 1986). The lowest total cost will depend upon management's goals concerning the percentage of end users it will be able to service at the time and place of need. Servicing 100% of the company's customers all of the time would require inventory levels far in excess of sound business practice. The integration of purchasing, manufacturing, and distribution will ultimately reduce the total cost of any product (Hall, 1983). However, tradeoffs are required. High inventories with lower transportation costs, low inventories using premium transportation, expensive packaging with no damage, and minimal packaging with tolerable damages are all tradeoffs that management must weigh and consider.

Since the early 1980's, many manufacturing and distribution systems have changed. Just-In-Time (JIT), Material Requirement Planning (MRP), and Economic Order Quantities (EOQ) are just a few of the integrated systems that are being used in today's manufacturing environment. These are a direct result of three major changes within the early part of this decade; transportation deregulation, the introduction of microprocessors, and the communication revolution (Williamson, 1982).

United Parcel Service (U.P.S.) is just one of many companies that has been able to take advantage of the changing manufacturing climate. Small

package volume within U.P.S. has more than tripled since 1980. This is indicative of the industry trend towards lower inventory and faster transportation. This explosive growth led to many operational changes at U.P.S., most of which have been "quick fixes" in order to solve an immediate problem. After a decade of patch and mend solutions, the efficiency of the distribution system was strained, resulting in service failures such as delayed deliveries and product damage. Both contribute to higher cost to the shipper as well as less profit to United Parcel Service.

The U.P.S. facility in Akron, Ohio was badly in need of reorganization. No one knew this more than the division manager. He assigned a colleague and myself to a one year position to analyze and correct the problems within Akron's facilities and give the operators a dispatching tool to work with until the year 2000. The goal was to completely reorganize the operation without interruption, since every package that arrives at the facility is to be delivered the same day. Such a reorganization required considerable input from all other functions, as well as ample planning and training, in order to prevent any interruption of service.

Existing System and Problems

Many different departments contribute to the package delivery system at U.P.S. The system operates around the clock. When a package is picked up from a customer to be delivered it proceeds through several manual sorts in the various hubs through-out the country depending upon the package's zip code. The Akron facility is not considered a hub because there are no packages arriving to it that are destined for other U.P.S. facilities. The nearest hub is in Cleveland, which consolidates packages going to Akron from the various hubs around the country and ships via tractor trailer. Columbus, Ohio also consolidates packages for delivery in Akron. These packages are unloaded from forty foot trailers and manually sorted to the proper brown delivery vehicle.

Under optimum conditions, each package should be physically handled once by five people, each having a generic name. The "unloader" simply empties the packages from the trailer onto a conveyor belt, never looking at the address. This is a physical job with little skill required. The conveyor belt passes by a "sorter" who visually scans the package zip code and places the package on one of the two conveyors that go to the slide that feeds the boxline. This person only needs to know whether the package is to be delivered on the north or the south side of Akron. The slide is a package accumulator in which the "charger" scans the package and determines in what color cage the package belongs. This person needs to know only the northern or the southern side of Akron, but he needs to know it well.The package is then removed from the boxline by the "preloader" who visually scans the zip code,the street name and the street number. The preloader puts the package onto a specific shelf in one of three to five package cars (the brown delivery vehicle) depending upon personal experience. Only a

single handling is needed at this point, from the "driver" to the consignee.

The driver records the package identification number on a delivery record. This delivery record is legal proof that the package was delivered to the consignee, if the shipper requests such verification. The tracing department is responsible for providing a shipper with proof of delivery. If such proof cannot be provided, a claim must be paid reimbursing the shipper for replacement costs. The following five sections describe the operation of the U.P.S. distribution system in detail.

Sort System

Packages arriving in Akron are unloaded out of the tractor trailers and are manually loaded onto one of the two conveyor belts which lead to opposite sides of the building (Figure 1). The packages are manually sorted via zip codes. At the end of each belt is a slide where the packages accumulate and are further sorted into a boxline.

A boxline is a continually revolving series of three compartment cages that run on a track almost the entire length of the building. The cage runs along the track for a length of twenty-four vehicles before it pivots and runs the distance of another twenty-four vehicles. The packages are unloaded into the vehicles before the cages again turn to be loaded back at the sorting area. Each of the cages is color coded with one of five colors.The cages each have three compartments; top, middle, and bottom (Figure 2). Each cage is approximately three feet in height and width and four feet deep, for a volume of thirty six cubic feet. Since there are five different colors of cages and three compartments in each, there are a total of fifteen different compartments that a package could be designated to.

When the packages come down the slide, they are manually sorted into a specific compartment depending on the address on the package. There are four to five part-time workers simultaneously feeding the packages into the boxline. Prior to the reorganization, this position was held by only the most experienced people that knew the Akron area well. None of the compartments were sorted purely by zip code so each individual needed to know all the street names and number breaks within the geographic area. The problems associated with extensive training, absenteeism, and turnover in the parttime work force made

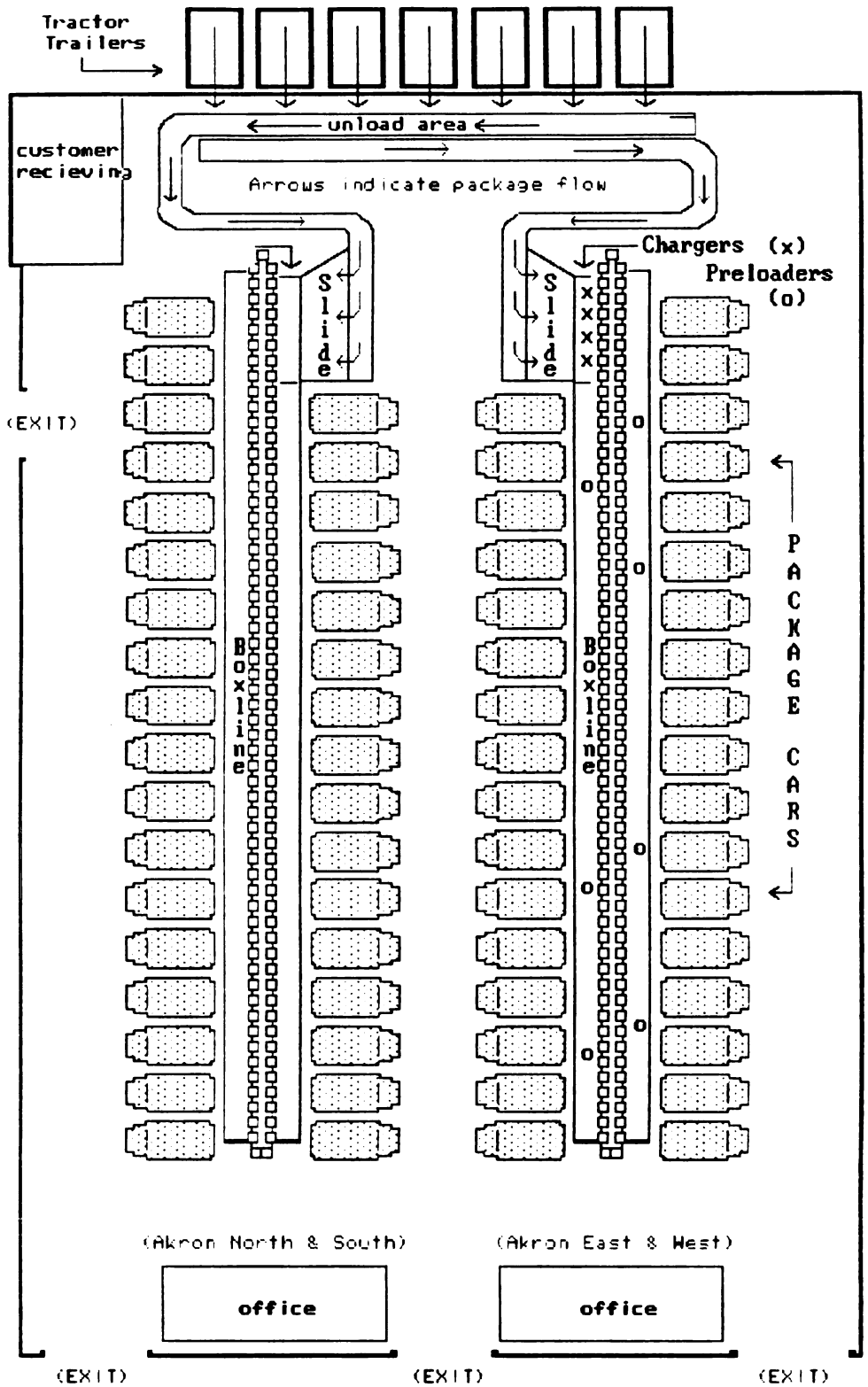


Figure 1: Akron facility and package flow.

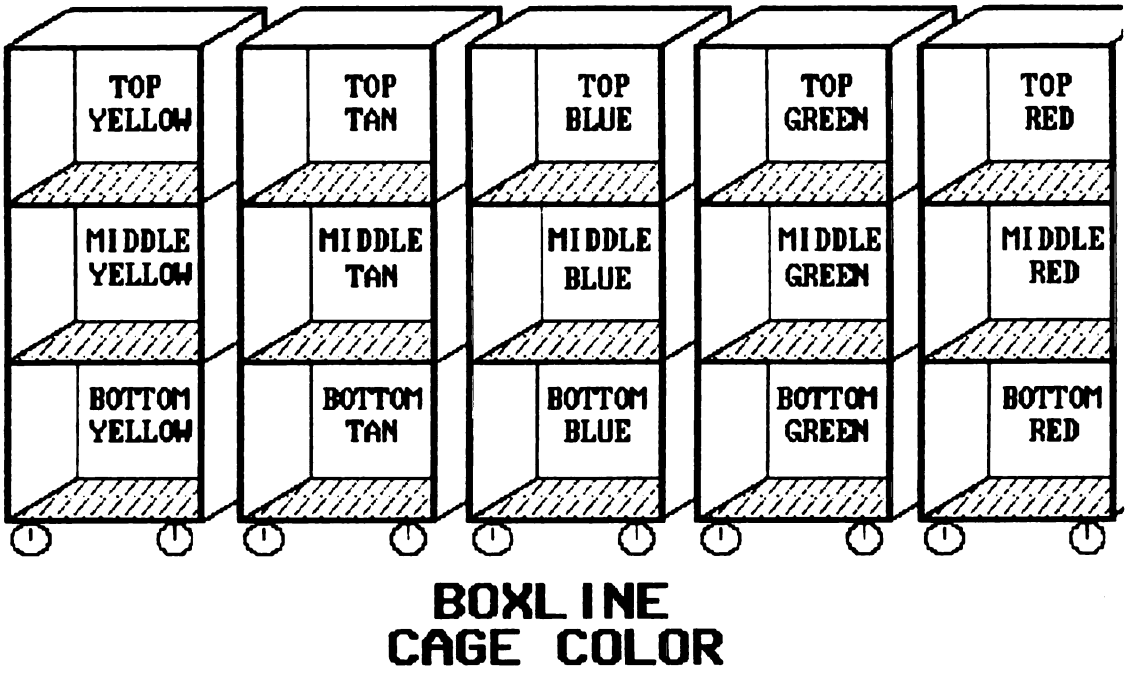


Figure 2: Boxline cage color.

it difficult to motivate or discipline employees filling the sort position. This position was not prestigious within the company, yet a good sorter was very difficult to replace.

Due to these problems, there were many packages that were "missorted" or put in the wrong compartments. This creates an additional handling, thereby increasing the probability of product damage.

Preload

The preload function within U.P.S. involves transferring the packages from the boxline to the brown delivery truck, or "package car" most of us are familiar with. The "preloader" position is another part time position. Employees filling this position work a four hour shift from 4:00 a.m. to 8:00 a.m. Within this time, a preloader loads three to five package cars, depending upon experience, from a single compartment (top red for example). He places the packages on the shelves and the floor of the package car in the order that they will be delivered throughout the day. The preloader also counts the daily stops a driver will make and thus accounts for the length of the driver's planned day.

Excessive stops for a single driver could be dispatched to another who does not have enough stops in order to make up an eight hour day. Deciding exactly which driver should take these excess stops became a problem that only the supervisor could solve. There was no predetermined method to rearrange these stops. Over the years, this patch and mend solution added to the Center's total mileage.

Custom loading was another problem. Since the preloader and the driver talked on a regular basis, the driver usually had the preloader load the vehicle in a way that he preferred. Whenever there was a substitute driver on the route due to vacations or absenteeism the substitute driver did not know how to deliver the packages in the usual order. Conversely, if the regular preloader was absent, the regular driver had a difficult time delivering the packages because the substitute preloader did not know the proper locations to place the packages. If a delivery driver discovers a package in the wrong place in the

package car, he usually has to travel extra miles in order to deliver it. This results in decreased efficiency, increased cost, and a longer work day for the driver.

Driver

The delivery driver and his package car incur the highest cost within all U.P.S. operations. Since the driver's hourly salary doubles that of any part time employee, the system must cater to the driver to make his task the most efficient. The driver knows best how his run should be routed, suggesting that most of the input on routing should come from him. In the past, drivers were not asked for advice because of U.P.S. top-down management style in 1978, the last time there was a massive system and routing change. This turned out to be a costly mistake for U.P.S. since the drivers were able to conjure up production excuses and display discontent that ultimately resulted in confrontation with management. Over the course of ten years, management changed certain routes, made small patch jobs to appease the drivers, and made concessions based on tradeoffs between certain drivers. Some of these changes were necessary based on package volume and population growth within certain areas.

Ultimately, the routing procedure was piecemeal.There were routes that had more than one driver delivering to the same business, routes that had drivers jumping across vast geographical areas, routes that delivered only to business stops, and some that had only residential stops.

Certain package cars were also over or under utilized. Large vehicles were often half empty when delivering to rural routes while small vehicles were "cubed out" while delivering to condensed areas. This would obviously damage packages and create unnecessary wear and tear on the vehicles. In an overloaded vehicle, the compression strength of a package is compromised, whereas in an under loaded vehicle, the package is subject to excessive shock and vibration due to the stiff springs on the larger package cars.

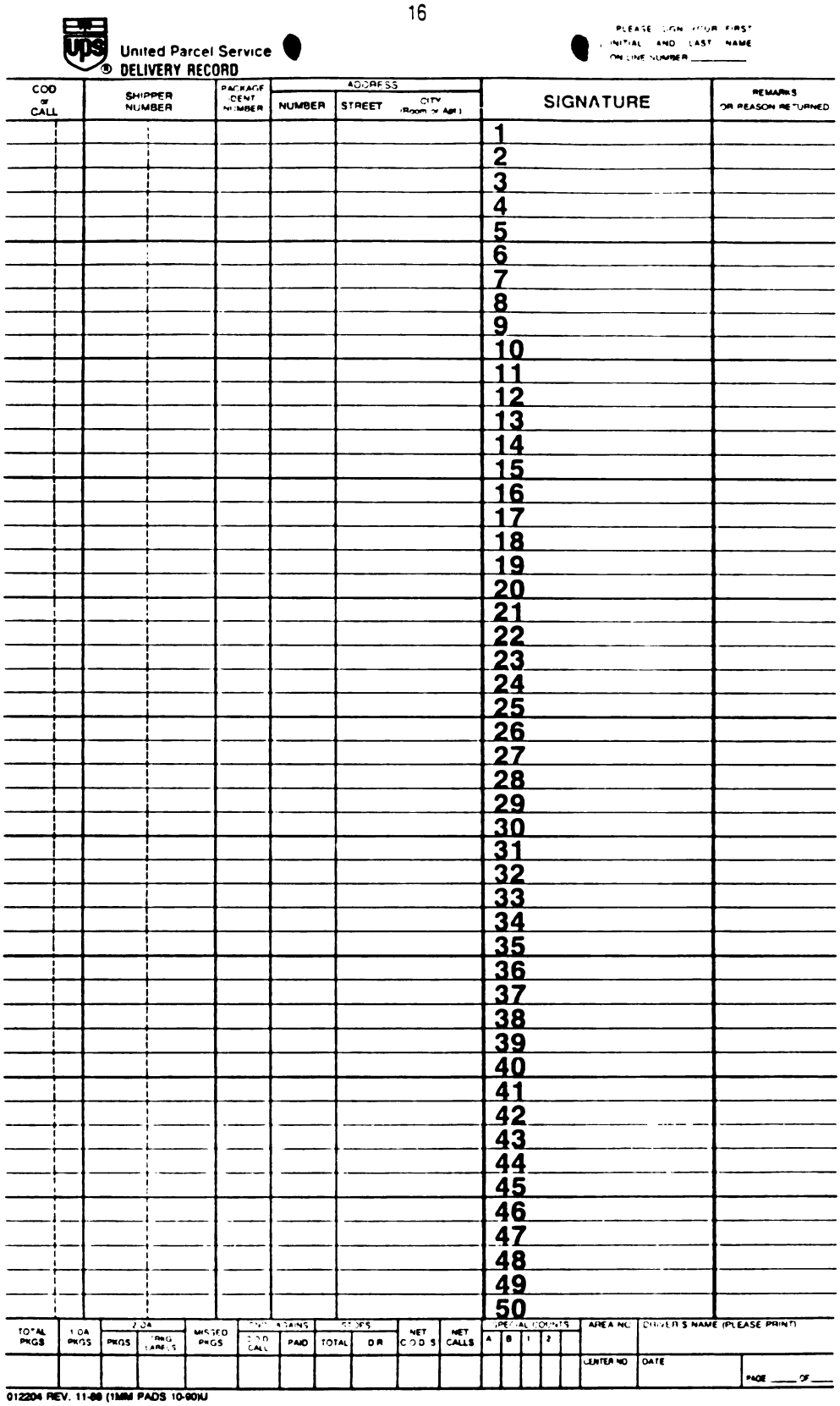
These observations and concerns over fuel conservation dictate that a small gas efficient package car should be used on rural routes.

Tracing

Any package that is given to U.P.S. for delivery must be properly recorded. The burden for proof of delivery falls on the tracing department. Every package that goes through the system has a six digit number assigned to it that is unique to a specific shipper. This is called a shipper number and anyone within U.P.S. can enter this six digit number into the computer and obtain the name and address of the shipper that turned that package over to U.P.S. This shipper number is always recorded on a delivery record when the package is delivered (Figure 3). Additional information is also written on the same line of the delivery record; such as who signed for the package or, in the case of a residential delivery, where the package was delivered (i.e., the back door, garage, front porch, etc).If the tracing department cannot prove delivery upon request, a claim will be paid to the company that shipped the package.

U.P.S. delivers eleven million packages daily. (U.P.S. Annual Report, 1991). The facility in Akron delivers approximately 25,000 packages daily. The geographical area that is served by the Akron facility covers predetermined zip codes that are divided into loops and within each loop, into several units. It is the driver's responsibility to record the shipper number next to the address where the package was delivered, in the proper unit. If the address and shipper number are recorded in an improper unit, the tracing department will not be able to locate the package and show proof of delivery, thus generating a claim.

As the loops and units changed due to these patch and mend solutions, communication between the operating centers and the tracing department diminished. The drivers were not recording package deliveries in the area that



United Parcel Service
DELIVERY RECORD

PLEASE SIGN YOUR FIRST INITIAL AND LAST NAME
OR LINE NUMBER _____

COD or CALL	SHIPPER NUMBER	PACKAGE (DENT NUMBER)	ADDRESS NUMBER	ADDRESS STREET	ADDRESS CITY (Room or Apt.)	SIGNATURE	REMARKS OR REASON RETURNED
						1	
						2	
						3	
						4	
						5	
						6	
						7	
						8	
						9	
						10	
						11	
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						46	
						47	
						48	
						49	
						50	

TOTAL PKGS	1 DA PKGS	2 DA PKGS	2 DA REG. LABELS	MISSED PKGS	COD CALL	COD GAINS PAID	STOPS TOTAL	STOPS DR	NET C.O.D. $	NET CALLS	SPECIAL COUNTS A	B	1	2		AREA NO.	DRIVER'S NAME (PLEASE PRINT)
																CENTER NO	DATE

012204 REV. 11-88 (1MM PADS 10-90)U

PAGE ____ OF ____

Figure 3: Drivers delivery record.

the tracing department would have looked for them. Therefore, when a shipper requested proof of delivery to one of their customers, it become more difficult to obtain a signature from the records. This would obviously result in a higher number of claims, and decreased profits for the company.

Facility

There are two boxlines in the Akron facility. The Akron East and Akron West operating centers are served by one boxline. These two centers experienced the greatest growth during the past decade and thus created the most operating problems. This boxline was targeted for improvement because it served the largest geographic area experiencing the growth.

An operating center is run by a single manager and three supervisors. Each center has approximately forty drivers. Past history has shown the best supervisor/driver ratio to be between 1:12 and 1:18. Work started with the center that needed improvement the most–Akron East.

Dispatching using geographical landmarks such as valleys, rivers, expressways, and main roads was general practice in the past. Dispatching this way has some advantages. Driver's mileage may be kept to a minimum, and a driver may be routed to avoid crossing busy intersections, railroad tracks and other minor delays. However, dispatching by geographical boundaries creates the problems that the sort, preload, and tracing operations had experienced.

CHAPTER 2: SYSTEM REORGANIZATION

The system was reorganized to dispatch according to zip codes. Since all addresses are assigned by the post office, zip code boundaries are usually political in nature, based on tax allocation rather than geographical boundaries.

The major advantage of dispatching by zip code is that it provides the long term planning and flexibility that management requires when installing new services. Furthermore, zip codes are easily identifiable by an inexperienced sorter. Additional facilities, when built, will have package volume diverted to them by zip code. A zip code designation can easily be shifted between buildings without major personnel, equipment or dispatch changes. Failure to dispatch by Zip Code would create a plan that has only a limited life. Although transportation efficiencies will be sacrificed, sort productivity and better package handling will offset increased delivery costs. After consulting with the division manager of the Akron facility, it was decided to use zip code boundaries rather than geographical boundaries in distribution routing.

Akron East and Akron West shared four zip codes. The two centers traded appropriate package volume to the center that had the major portion of the zip codes. Akron East now contains the following zip codes (which are two less than they had before reorganization).

AKRON EAST

44136	Hudson	44202	Aurora
44124	Stow	44155	Mantua
44140	Kent	44166	Ravenna
44142	Streetsboro		

Individual maps of the above towns were obtained from the local Chamber of Commerce. In addition, the post office had complete listings of the streets and roads within each zip code. It was thus possible to plot an average day's package volume to each street within a zip code by analyzing all of the delivery records from the drivers in the area.

U.P.S. Operations uses time study methods to accurately determine the length of time it takes to perform a certain task. When delivering eleven million packages a day, the time study results are very reliable. For example, delivering to a residential house generally takes less time than that for a business, all other things being equal. A residential delivery usually does not require a signature and thus the time allotted will generally be less. Each delivery area has its own "on stop allowance" that takes into consideration all the tasks needed in order to deliver the package. For example, developments where the houses sit further from the street are allotted more time than houses with very short sidewalks. The task of package placement is the same for both types of stops but the walk distance will vary. From this information, the number of drivers required to deliver the packages for that day per zip code can be determined. Time study measurements also reflect the concentration of deliveries, which will influence vehicle size (highly concentrated areas need

larger vehicles) and determine the number of cages in the boxline the sorter will need to transfer the packages from the slide to the preloader.

Posting Volume to Zip Code

For a fee, the Post Office provides an alphabetical listing of all the streets along with the address ranges for each street, within each zip code. The information is more current than any map available. For illustration purposes, dispatch of the 44202 zip code, one of the seven zip codes in the Akron East center, will be described in this section.

The town of Aurora is located north of Akron and south east of Cleveland. This zip code was illustrated because of the many variables found within it. These include two amusement parks, (Sea World and Geauga Lake), a factory outlet store, a manufacturing complex, a very fast developing residential area, and some rural country side. Discussing the process for the remaining zip codes within the center would be repetitive, as the methodology used was basically the same for each zip code.

Lotus 1.2.3. software was used. The spreadsheets provide easy manipulation of data. A simple spreadsheet was developed which allowed data sorting capabilities superior to most widely available software programs. Once the data was sorted, this information was keyed into the U.P.S. program that is integrated throughout the various functions. The U.P.S. program will not be elaborated on as it is copyrighted and proprietary. The list of street names and number breaks were key entered directly from the purchased post office listing mentioned earlier (Table 1). This list serves as the basic building block in the methodology, from which all addresses within the zip code are covered when developing the "area trace". Next to each street, each stop and the number of packages was tallied. This information was obtained directly from the driver's delivery records. A single day's records were used. This day had average volume,

good weather, and minimal dispatching problems. Using more than one day's records would be more accurate but would be more time consuming.

To determine which day to choose for "average volume", daily volume was tallied on a weekly average from January through October. November's and December's package volume did not represent normal or average delivery patterns due to the holiday season and would heavily skew the mean weekly delivery volume. The average daily volume for these ten months was 6747 packages. Subtracting 6747 from the weeks' average daily volume will show the volume variations throughout the year. Using Lotus graph capabilities these variations were plotted from the mean as shown in Figure 4. From this information, the first Tuesday in March delivery records were used as they best resemble "average volume".

There are two types of stops: signature required stops (businesses) or driver release stops (residential). When delivering a package, the driver must get a signature on the delivery record or he can place the package in a safe location and leave the customer a notice. All businesses require a signature as well as any residential areas that have a past record of a high ratio of claims per packages delivered. The reason for separation when tallying will become apparent later. After totaling all stops, the driver requirements to deliver all packages in the area for a single day were estimated. To minimize the amount of package shifting between drivers in the morning during the preload operation, it is important to have only three or four drivers per loop. If the zip code contains enough stops for more than four drivers, the area should be split into two loops or more. This reasoning will become more apparent during the final dispatching later in the paper.

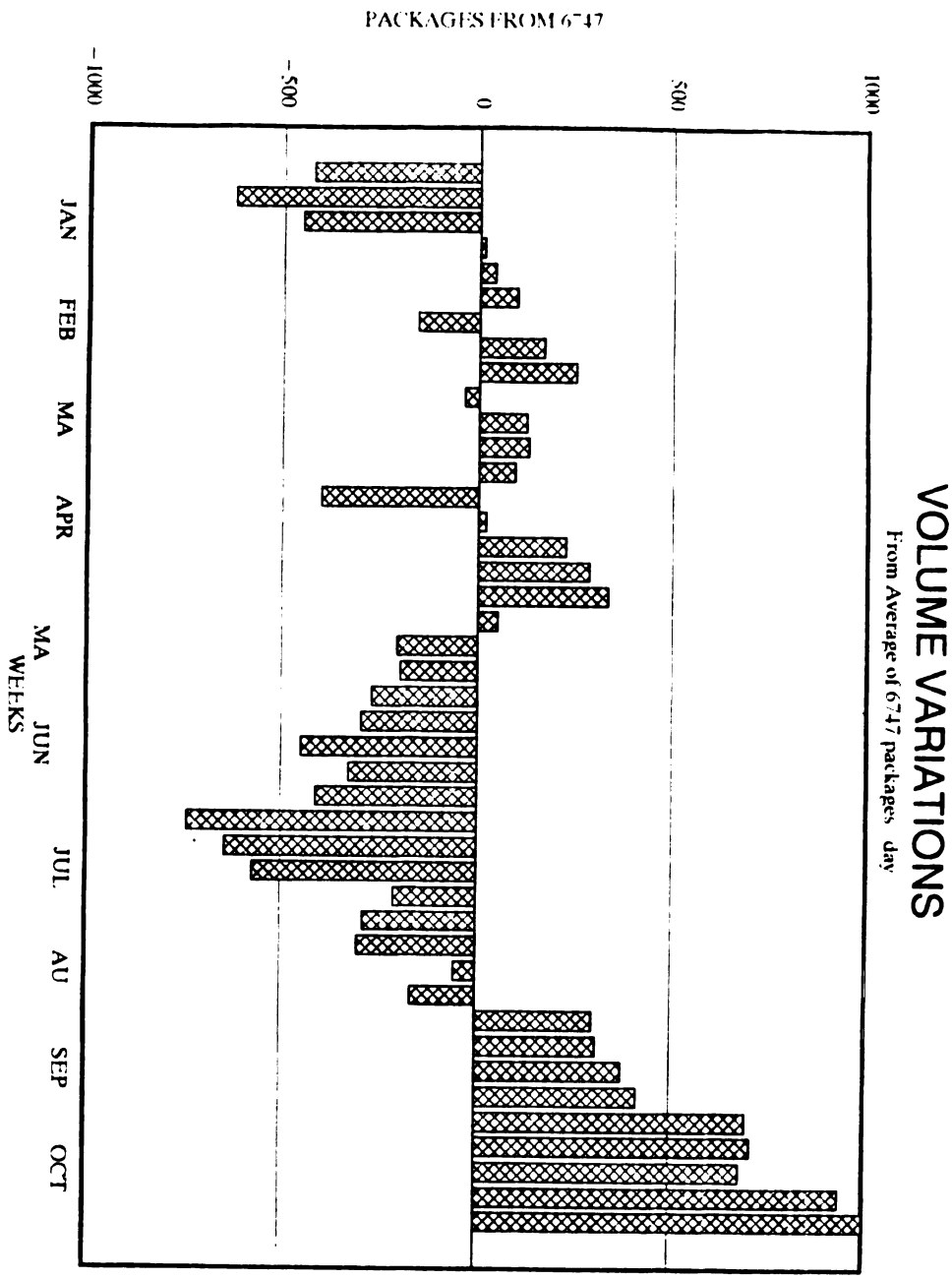


Figure 4: Package volume variations from mean

After entering this information and totaling it, this zip code yields 318 stops: 101 signature required stops, 217 driver release stops, and a total of 756 packages that were to be delivered that day. Knowing that the drivers in the area average 100 delivery stops per day, it was estimated that three drivers would be required to deliver all packages in the zip code.

With the information entered into the spreadsheet, simple Lotus commands can sort the data. First, the most frequent signature-required roads are sorted. Once identified, it is evident that the fifteen top ten streets contain 83 of the total 318 stops in the zip code (Table 2). These stops total 336 packages or 44% of the packages delivered that day. These streets where the businesses are located are dotted on the map shown in Figure 5. Each of these stops averages 3.5 packages per stop. These streets should be delivered to as soon as possible in the morning for several reasons. This will empty a large portion of the package car thus allowing for easier maneuvering within the vehicle. Also most commercial customers prefer morning delivery so they can replenish stock, finish work in process, or turn merchandise around for further distribution the same day. This continues to be increasingly important for Just-In-Time philosophies.

Delivering to residential stops in the morning may leave packages susceptible to damage from inclement weather for the remainder of the day, and to theft, especially if the house is occupied by working couples that do not get home until later in the day.

To minimize fluctuations with morning delivery times for businesses, it is desirable to keep delivery paths constant. Each individual driver's route should be set up to keep the same morning work on a daily basis regardless of the total

TOP SIGNATURE STOPS

SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
1	36	Chillicothe Rd South	549	ONLY	10		131
2	84	Chillicothe Rd South	1	349X	10	10	33
3	308	Garfield Rd West	251	ONLY	9		22
4	316	Garfield Rd East	1	339	8		26
5	284	Aurora Rd South	1	999	5		6
6	20	Lena Dr	1	999	4		16
7	24	Danner Dr	1200	1500	4		13
8	328	Aurora Rd North	800	999	4		4
9	940	Aurora Huson Rd	1	500	4		5
10	976	Aurora Huson Rd	501	1599	4		7
11	4	Chillicothe Rd South	1372	1799X	3		18
12	12	Chillicothe Rd South	1250	1370X	3		10
13	700	Bissell Rd South	1	799	2	4	14
14	296	Garfield Rd West	1	200	2		10
A)	TOTAL ABOVE 15 STOPS			TOTAL	72	14	315
B)	TOTAL IN ENTIRE LOOP				101	217	756
C)	PERCENTAGE A/B*100				71	6 %	42 %

Table 2: Top signature streets.

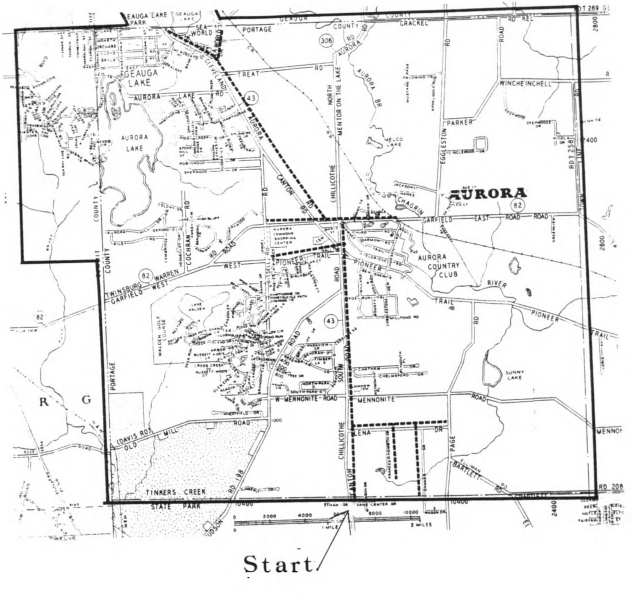


Figure 5: Map - Aurora's business streets.

amount of packages and stops that are dispatched that day. Shifting of work between drivers should be done with residential deliveries. These stops would, in general, be afternoon work. Most residential stops require delivery of a single package. To balance work loads, it is easier for the preloader to move one stop of one package from one driver to another rather than one stop of three to four packages. This will be expanded upon later in the study. As shown in Figure 5, there are only a few streets in Aurora that carry the majority of the businesses. These streets need to be divided between the three drivers expected to be delivering in this zip code. After consulting with the drivers, it was determined where the basic "a.m." areas covered by each driver would be split.

One driver starts at Aurora Commons shopping center, on Garfield Road West. He then delivers the business and residential stops going up Aurora Road to Seaworld and Geauga Lake Amusement parks. These two stops are fairly heavy as shown on the spreadsheet. He arrives at these stops shortly before noon, after the initial traffic rush of visitors entering the theme parks.

Another driver starts at the Factory Outlet Mall on Chillicothe Rd. South. He arrives approximately 9:30 a.m. just as the stores are opening and before any crowds or heavy traffic begin to arrive. He then proceeds north delivering to Chillocothe Road up to the center of town. This gets him off the busiest road in Aurora by noon.

The third driver starts delivering at the zip code boundary on Chillicothe Road South and proceeds north to Lena Drive. Lena Drive, Danner Drive, and Frances D. Kenneth Drive are where most of the heavy industry in Aurora is located. There is one very heavy shipper called Little Tykes, a children toy manufacturer that produces large light weight plastic toys. Their large packages

fill a good portion of the vehicle. This should be one of the first stops in order to clear the drivers walkway in his vehicle.

It is evident that all three drivers have one thing in common, they all wish to go to the heaviest delivery stops first. This clears out the back of the vehicle so they can see exactly how many packages are left for the rest of the day. It provides for easy maneuvering within the back of the vehicle and avoids damage to the remaining packages. Furthermore, delivering heavy stops in the morning allows easier access to dock space and the personnel to assist the driver when a signature is required. A smart driver will have the people at the dock assist in the unloading of his vehicle whenever possible, thereby increasing his efficiency.

Delivering businesses in the morning will get the driver away from the heaviest traffic flow before the lunch time rush. Morning deliveries also will be fairly constant stops on a daily basis as compared with the residential deliveries.

The next task is how to most efficiently dispatch unpredictable afternoon work. It is this work that is dispatched to any of the drivers in the zip code based on total package volume entering that area on a daily basis. This work must be easily transferred before the drivers leave the building in the morning. The preloader must be able to make the transfers without first being instructed to do so by a supervisor. This is commonly referred to as using the "loop concept".

Developing the Area Trace

The loop concept takes into consideration a hypothetical situation where there is a package to be delivered at every possible address within the zip code on a single day. In addition, it assumes that a single driver will deliver to each possible address within the 44202 zip code. Finally, it uses a prescribed route to minimize mileage. This is called an "area trace". As the area trace develops, a number is assigned to each street, road,or segment thereof. This is called a sequence number. Sequence numbers progress through a logical flow within the loop.The loop layout is usually developed on a trial and error basis. With an open mind and the cooperation and input from the drivers, a pattern emerges and a successful layout is designed.

The initial stages of the area trace evolved by taking into consideration the business stops. This is the foundation of the zip code layout. The closest road to the building within the zip code is the first sequence number. On Aurora's map, Chillicothe Road South is the first sequence number. From this point, a line is drawn connecting all business stops as if a single driver was delivering a single package to every business. The line should be kept as short as possible coinciding with the required concept of minimizing mileage (Figure 5).

The drivers themselves suggested which businesses each should deliver to. The starting (s) and finishing (f) points for each driver's business deliveries should be marked. The driver who delivers furthest away from the starting point is called the "A" driver, the next furthest, the "B" driver, and the closest driver is called the "C" driver (Figure 6).If package volume requires an additional driver, as there would be during the busy holiday season, he would be considered the "D" driver. This driver was considered first when developing the

loop by deciding what area should first be given to this "D" driver when the volume is heavy. It is not advisable to give this driver business stops, for this will change the normal business delivery times for the remaining businesses in the loop. In addition, it is more difficult to deliver business packages as opposed to residential packages when the driver does not know the dock or delivery point required. Therefore, the residential deliveries closest to the starting point should be the last sequence numbers in the loop and are the first stops the "D" driver will help deliver when easing the workload for the other three drivers. This is why it is called a loop. This package volume is what the three bid drivers in the 44202 zip code will release when volume dictates. This is how the drivers keep an eight to nine hour dispatch time.

On the Aurora map, the area by Lake Walden and to the east of Hudson Road would appear to be the area to release to this "D" driver. However, it should first be determined how many packages are in this area. All residential (driver release) volume to each subdivision, development or logical break is plotted. Figure 7 shows the area near Old Mill Rd contains six stops, the area just North of W. Mennonite Rd to contain seventeen stops, and Chatam and Chelmsford Roads contain twelve stops. These thirty-five stops are obtained from delivery records showing average volume. When volume is heavier, there would be a significant increase in package volume for this area and it would account for three to four hours of work. Additional stops could come from the Walden Lake complex if so desired.

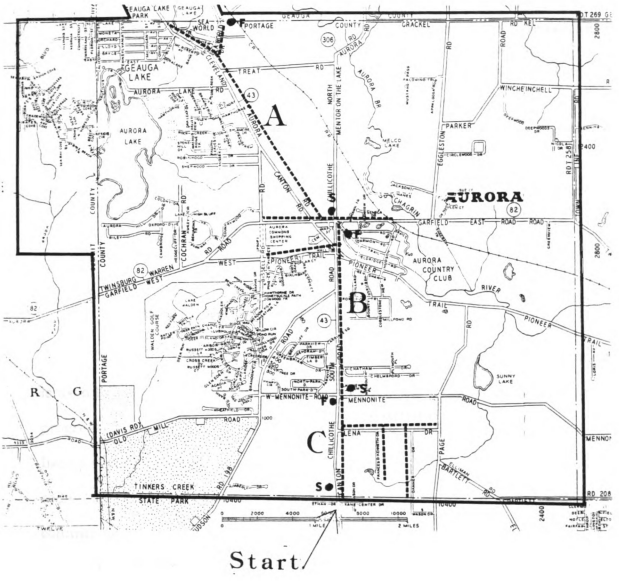


Figure 6: Driver's start and finishing points for business only.

Both the beginning and ending sequence numbers in the area trace have been established. Several common sense rules for finishing the area trace are adhered to, as follows:

1. Right hand turns shape the trace. It requires extra time to make left hand turns cutting across oncoming traffic, as well as taking into consideration the safety aspect. Making right hand turns gave the loop a counter clock wise layout.

2. The trace was routed to avoid delays such as school closings, factory shift changes, or other peculiarities specific to an area.

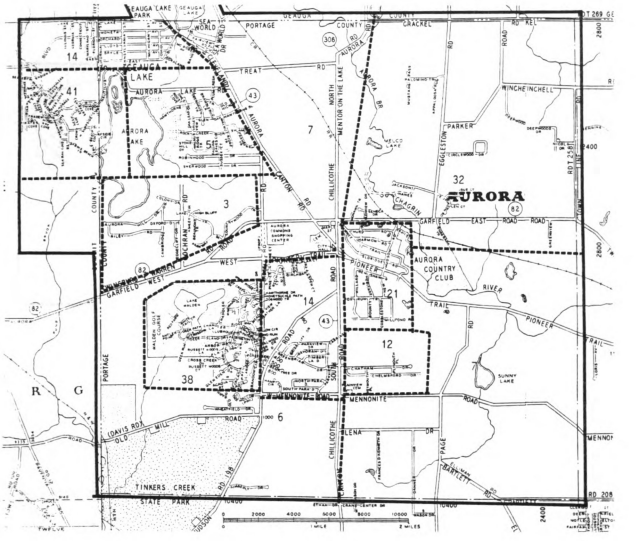
3. On busy roads, delivery of one side of the road was completed before turning around once and completing the other side. This prevents the driver from walking across busy roads, especially if there are more than two lanes of traffic.

4. The area is to be delivered in quadrants. Defined units for proper recording are easier to establish.

The general area trace for Aurora is shown in Figure 8. The drivers input is used to trace each area. Each street was assigned a number as the drivers progressed through the zip code. This number was posted on the alphabetical listing of street names. This procedure was continued through the entire zip code. Any streets that had been skipped did not have a number in the first column, and therefore were assigned one.

Once all streets had been assigned a temporary number, the sort capabilities of the Lotus program were used to rearrange the streets by the numerical flow (Table 4). This completed the area trace.

The trace's numeric flow, i.e., 1,2,3. . . will be permanent until the next reorganization. Changing these numbers would confuse the preloaders. However, growth must be planned for, and as new streets are built they must



Number of residential stops in each development.

Figure 7: Map - Residence stops.

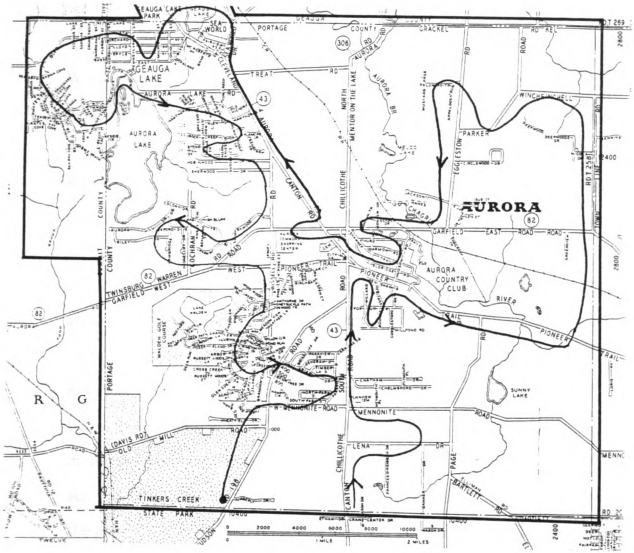


Figure 8: Map - General area trace.

be included in the area trace. Inserting gaps between these sequence numbers allowed for such growth without changing all the subsequent sequence numbers. Any new streets can then be easily added.

The loop is divided into units. Units are required to increase the communication between the driver and the tracing and claims departments. Without these units a person would have to search through the entire 756 packages on the driver's delivery records to locate a package being sent to Aurora on a single day. Before a claim is paid for a lost package, the delivery records are visually scanned one day before the expected delivery day and ten days following that day. Without dividing the loop into units, this would require scanning over nine thousand packages on the delivery records. Dividing the loop into six to eight units would reduce the number of packages to be scanned to eleven to fifteen hundred. Aurora's package volume dictated the need for six units. Unit nomenclature is standard across the country within U.P.S. Odd numbers signify morning work, and even numbers signify afternoon work. Under ideal conditions, the "C" driver will have units one and two, the "B" driver will have units three and four, and the "A" driver will have units five and six. The first three digits of the zip code (442) are common to all the zip codes in the area. The last two digits become more specific to each area. We used these two digits to name the new loops within the center. For example, the 44236 zip code was called the 3600 loop and the 44224 zip code was called the 2400 loop. The units are caled 2001, 2003, 2005, 2006, 2004, and 2002.

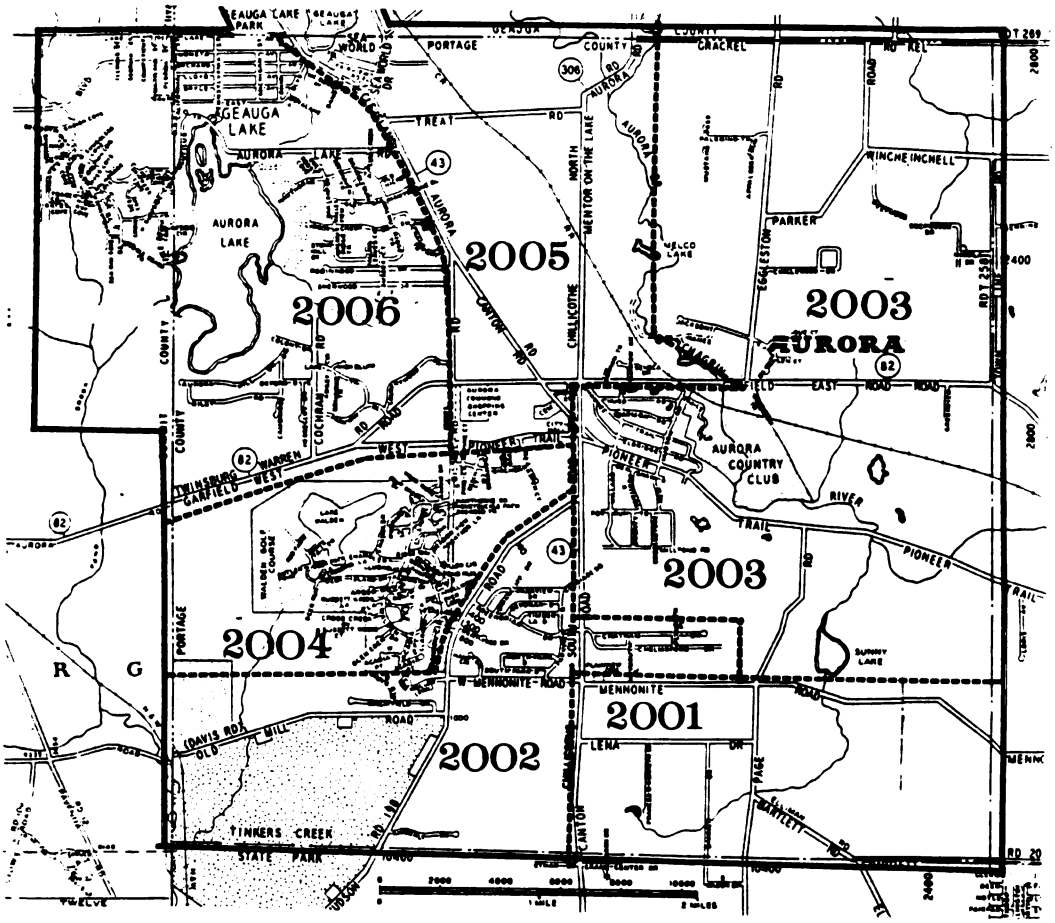
The map of Aurora was geographically subdivided to reflect the unit numbers. This was done on a trial and error basis. Using the area trace to follow the map usually provides logical geographical breaks where unit

TABLE 4

UNIT	SIGNATURE STOPS	RELEASE STOPS	PACKAGES
2001	16	4	97
2003	31	67	287
2005	37	12	168
2006	4	63	82
2004	4	39	67
2002	9	32	55
TOTAL	101	217	756

ZIP CODE 44202

Table 4: Unit volume



Aurora

Zip Code 44202

Figure 9: Final map including units.

numbers can be inserted. This allows the regular driver as well as any substitute drivers to record the packages in the proper unit by simply looking at the map. The 2000 loop map is shown in Figure 9.

The unit numbers are inserted in the Delivery Order Listing (DOL) spreadsheet in the column before the sequence number. Unit package volume and delivery stops are totaled (Table 4). The odd numbered units contained the majority of signature stops while the even numbered units contained more release stops.

Dispatching

Controlling the dispatch provides the framework for an organized and uniform method of operational changes based on the daily fluctuations in package volume. Each local area has certain peculiarities and conditions that must be recognized. Each driver also has certain abilities and specific personal needs that will vary on a daily basis. Finally, the Company has the right to be flexible in order to remain competitive by offering new services and continuing to provide profit for it's shareholders. The dispatching system using the area trace is basically a commitment on everyone's part to develop a realistic and workable system in the face of the numerous changes in the delivery operation. These commitments also imply accoutability. U.P.S.' commitment to the timely, dependable pickup and delivery of small packages is the basis for its growth. When the U.P.S. sales force tells a customer that a package will take so many days to deliver, there must be a total commitment within all functions to provide for this. If package volume is high, such as is exhibited during the Christmas holiday season, the timeliness of delivery must remain the same as that in the summer months when volume does not fill up the tractor trailers. Dispatching using the developed area trace provide flexibility while insuring accountability.

Every hourly person involved in the actual physical movement of packages is a member of the International Brotherhood of Teamsters. Bargaining procedures throughout the history of U.P.S. and the Teamsters have created certain guidelines outlined in the contract that provides individual security yet gives the company the flexibility it needs to run the business.

One of the driver's rights is a guaranteed eight hours of pay. The driver

gets paid for at least eight hours or the entire time he is on the clock whichever is greater. In addition, if the driver completes dispatched work in less time, he will still get paid for that entire dispatched number of hours. For example, if a driver completes a nine hour dispatched day in seven hours, he will still receive nine hours pay. One hour of the day's pay would be overtime which is considered "time and one half". If he is dispatched a seven hour day and completes it in seven hours, he will be paid his guaranteed eight hours. Finally, if a driver is dispatched for a nine hour day and completes it in ten hours he would get ten hours pay with two hours overtime pay. However, this driver would be considered "overallowed", or in other words, he worked an hour longer than he should have. "Overallow" and "underallow" are based on actual time to plan time. These overallowed hours are excess cost, the bottom line in monitoring the efficiency of an individual, a supervisor, and an operating center such as Akron East.

Controlling the dispatch will enable the center to efficiently put the desired amount of work to a driver in a manner that will best serve the customer while minimizing excess cost.

Package volume during the course of the year varies on a daily basis. As seen in Figure 10 the ten month low of six thousand packages around the Fourth of July is almost one third less packages than are delivered in late October. Obviously, staffing the operation for Octobers' requirements would result in excess cost during the slow periods in the summer months. Staffing only for summer months would mean increasing the work day an additional 30% for each driver during October. Some drivers would like to work this much overtime but the majority of drivers would like their work day

dispatched as close to eight hours as possible on a consistent basis. On the other hand, the company would like to dispatch the driver with a minimum of eight and one half hours providing a half hour margin from the guaranteed eight hour day required by the Union. Dispatching less than an eight hour day always results in excess cost. With this in mind, each center's management team must decide on the number of drivers to put on the payroll. Drivers can be laid off on a daily basis if the package volume warrants it. These drivers would have the least seniority. Over staffing the center is not only abusive to the least senior drivers but is costly to the company since full benefits are still being paid to the laid off drivers.

Staffing for the Akron East center is based on a daily volume of seven thousand packages. This is higher than the actual average of 6747 packages a day. Most vacation time is taken during the summer months and it is desirable to have extra drivers to compensate for those on vacation. Akron East employs thirty-seven drivers.

As mentioned earlier, Aurora's zip code averages 756 packages to be delivered on a daily basis. This package volume warrants approximately three drivers.

In addition to delivering packages, the driver also has a "pickup" schedule. The pickup stops that a driver is responsible for will require additional time that is fairly constant. The variables of the pickup route are minimal compared to that of the delivery route. The stops are known and a routine is easily established since the travel path is well laid out. The pickup portion of the day is from 3:00 to 5:00 and the length of time it takes to complete the pickup from shippers varies only plus or minus fifteen minutes. This

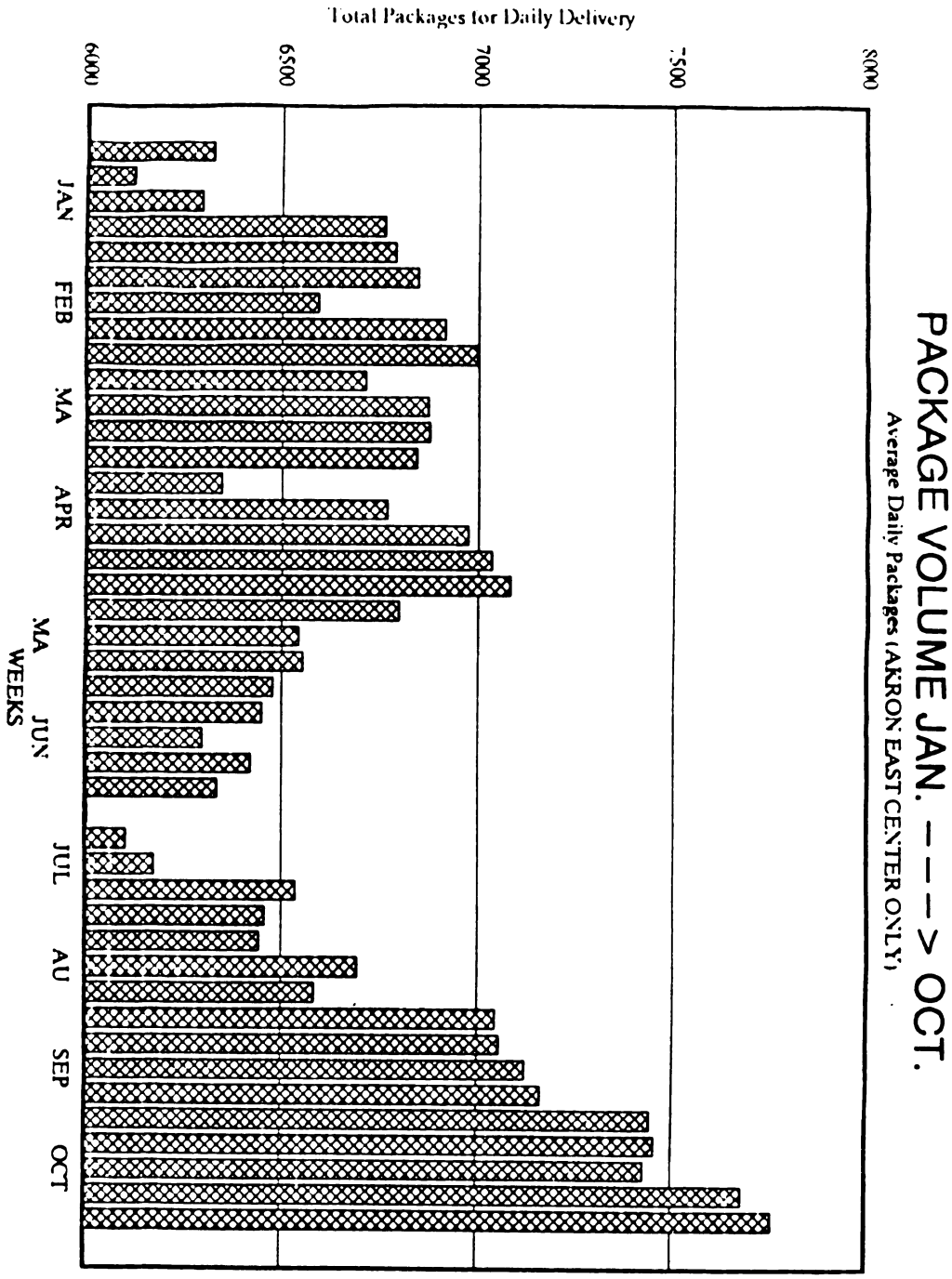


Figure 10: Daily package volume, January through October.

provides the customer the opportunity to make their operational plans coincide with U.P.S. pickup times. The customer can then plan a deadline for order acceptance and fulfillment of that order to meet their customer's needs by utilizing U.P.S.'s time-in-transit options. Varying the planned day of a driver by changing the pickup accounts on a daily basis is unacceptable. Since making public the accounts in Aurora and how they are routed may prove valuable for competitors, I must limit the scope of this paper to the delivery portion of the planned day.

"A" Driver

The first driver in each loop to be dispatched is the driver that is the farthest away from the center. This is the "A" driver. His morning deliveries start at sequence number 280 and proceeds through sequence number 384 where there are 168 packages to be delivered in 49 stops.He is at the furthest point within the zip code and ready to start the afternoon portion of his day. By this time most all of the business stops are completed and the remainder of the day will be residential deliveries followed by his pickup route. Following the progression of the loop's area trace, he continues delivering to stops in the northern portion of the zip code. The route will take him closer to the center's building from this point on. Counting the stops posted from the Delivery Order Listing he will have 116 stops and 250 packages to deliver. Considering the total mileage and stops previous to reorganization, this should provide the driver with an eight and one half hour planned day. However, this driver prefers the overtime pay and so would like more planned time. This was accomplished by extending his day to deliver to a few stops in the 2004 unit. This gives him a total of 264 packages to deliver.

When package volume increases, he will not be able to extend his delivery area as far south as initially planned. A nine hour planned day may require only the stops up until sequence number 568 which is Nautilus Trail. During the summer months when package volume is low, he may have to deliver up to higher sequence numbers in order to maintain a nine hour planned dispatch. If a substitute driver is running the route, the delivery load can be lightened by easing back on the last sequence numbers dispatched. This will give that substitute driver more time to deliver the packages due to lack of area knowledge as compared to the regular driver.

"B" Driver

Once the "A" driver has the desired amount of stops and packages dispatched, the start of the residential deliveries the "B" driver is dispatched with is fixed. The morning deliveries have already been assigned. Counting the stops off the Delivery Order Listing show that the "B" driver's morning deliveries start at Aurora Farms Factory Outlet and continue until the "A" driver's morning delivery begins. This contains sequence numbers 40 to 246. There are 287 packages and 98 stops. This is a heavier a.m. load than the "A" driver. Therefore his p.m. load should be lighter in comparison. His p.m. delivery starts at the sequence number where the "A" driver leaves off and will change on a daily basis dependent on the "A" drivers dispatch. On heavier package volume days, he will start delivering his p.m. packages farther North. The morning deliveries consistently end near the Route 82 and Route 43 intersection. Mileage from this point to anywhere the "A" driver stops delivering should not exceed much over a mile. It is desirable to have the morning area trace finish near such an "add-pull" area in the p.m. portion of the loop.This will minimize mileage between delivery stops. The "add-pull" areas are adjustment stops that are directly adjacent to the next driver's area.This area can be dispatched to either driver at the preloader's discretion. If package volume warrants package shifting beyond this "add-pull" sequence number range, the preloader will need to contact the supervisor for advise in doing so. The "B" driver has two of these "add-pull" ranges. He shares with the "A" driver the front side of his p.m. work and at the tail end of his p.m. work, the delivery area is shared with the "C" driver.

"C" Driver

The "C" driver is dispatched much like the "B" driver. When both the "A" driver and "B" driver are set with the desired planned work day, the "C" driver delivers the remaining package volume left in the zip code. If the package volume is still too much for the three drivers, the excess work can be dispatched to any other "C" driver in the center. If the volume does not warrant three drivers, the "C" driver will be dispatched with remaining package volume in another loop or zip code. The morning deliveries in the southern portion of the loops contain packages with considerable weight. Presently, there is no consideration within U.P.S. time studies to allow more time for heavier packages. Therefore, the twenty stops with the 97 packages that the "C" driver delivers in the morning may seem less difficult than the other two drivers' morning deliveries but these 97 packages are just as time consuming to deliver in comparison. The p.m. portion of the day starts at the last sequence number of the "B" driver which is sequence number 820. He proceeds through the loop and finishes at the last sequence number, 980. On an average day of 6747 packages arriving at the center there will not be enough packages in Aurora's zip code to efficiently dispatch three drivers. From the day of posted delivery volume, the "C" driver had 79 stops and 174 packages.

The "C" driver should not have any assigned pickup stops within Aurora. This would require the extra deliery stops to be in close vicinity in order to return to make these pickup stops. It is best if the "C" driver delivers all day. He can call the center and make any pickups that requires an additional pickup stop after the initial driver has already stopped. This is especially needed for large shippers who frequently give U.P.S. enough packages to fill a vehicle. The

"C" driver or the lowest driver in the loop requires the most flexibility and giving him a pickup route would limit his responsiveness.

The packages the "C" driver will get to fill out the day depends upon the volume of the nearby zip codes. It is the supervisor's job to determine where these packages will come from in the case of low volume. In contrast, the excess packages in Aurora will require a driver in another zip code to deliver them. The supervisor needs to make these decisions at the end of the preload shift before drivers leave the building. Figure 11 illustrates how the areas may tie together.

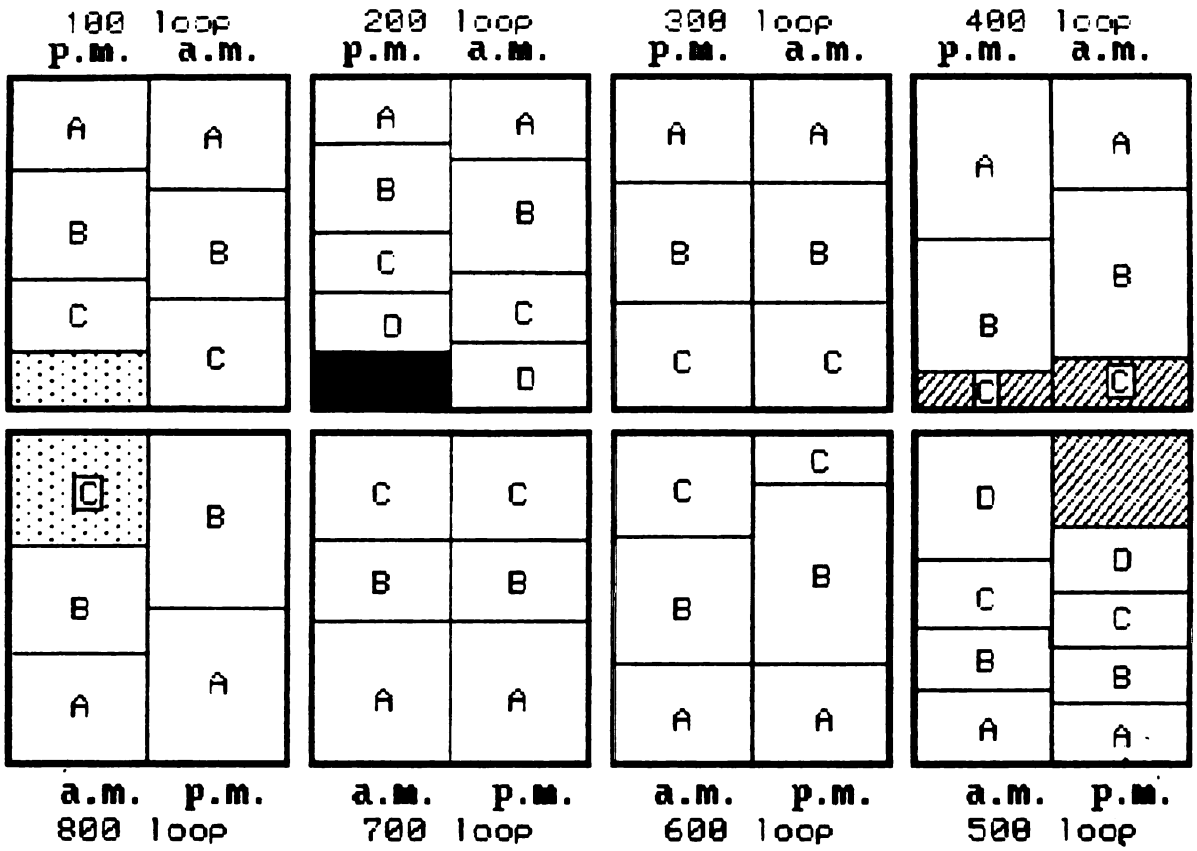


Figure 11: Dispatching extra stops between adjacent loops.

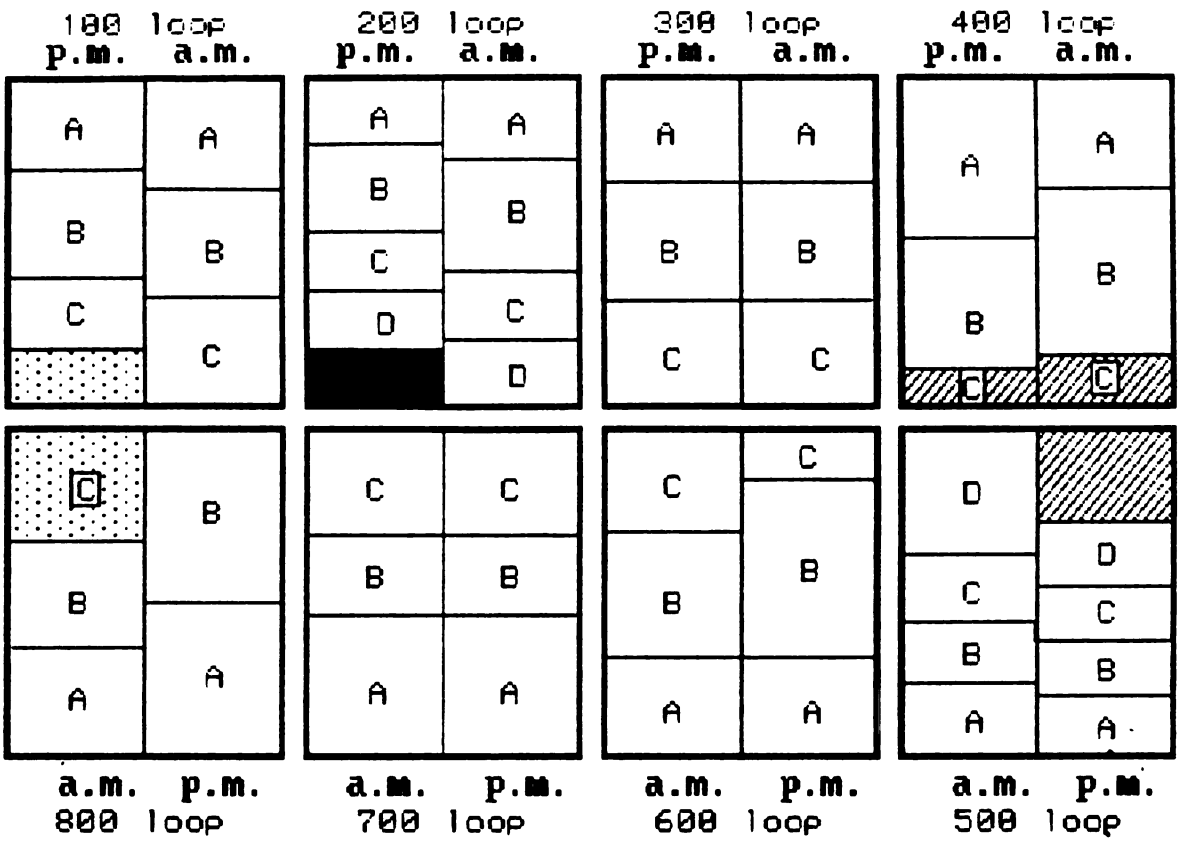


Figure 11: Dispatching extra stops between adjacent loops.

Training

The preloader dispatches the drivers on a daily basis. The supervisor will give the projected package volume estimates in a preoperation meeting. The preloader then estimates what sequence numbers the "A" and "B" drivers will conclude their p.m. deliveries. During the preload operation, if the preloader determines either of these drivers package volume needs adjusting, he can automatically change the beginning or ending sequence numbers as long as the numbers are in the "add-pull" range.

The packages are loaded in the vehicle in a "stop-for-stop" order. There are two shelves on each side of the package car. These shelves are divided into sections (Figure 12). Section one is delivered first. Sections two through four are delivered next. When all the packages in these four sections have been delivered, the driver will pull sections five through eight to the front of the vehicle. This method of package placement on the shelves shortens the walk distance from the driver's seat to the package and after picking the package up the walk distance exiting the vehicle. The floor is used only for large packages that would not fit on the shelf or for delivery stops containing many packages that are removed from the rear of the vehicle.

The "A" driver will deliver an average of 264 packages daily. Sea World Amusement Park has 43 of these packages and Geauga Lake Amusement Park has another 15 packages. These packages are placed on the rear end of the vehicle by the back overhead door. This allows easy access for removal when backing up to a dock. The remaining 206 packages are distributed on the shelves. Logical sequence number breaks are used to separate the packages by keeping subdivisions on the same shelf so a driver can remain confident that

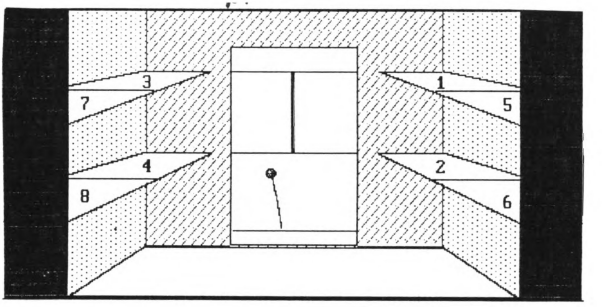


Figure 12: Shelf sections of package car.

all the deliveries for that area are completed. This will minimize back tracking in case a package is misplaced.

The "B" and "C" drivers' shelves are arranged so packages are accessible for rear door and dock deliveries. Packages for residential deliveries are loaded on the front shelves.

The Delivery Order Listing was sorted by package volume, signature and residential stops. Table 5 was used to help the preloader memorize sequence numbers. This table, a copy of the car load diagrams (Figure 13), the delivery order listing, and an alphabetical street listing (Table 6) was given to the preloader at least one week before implementation began. Sufficient time was allowed after sort time for study of the changes.

Loop implementation progressed at the rate of one zip code every three weeks. This required a continuing process of training. Changes to the delivery order listing after implementation were expected, and keeping the preloader informed during this process was critical. Most changes to the Delivery Order Listing and car load diagrams were finalized two weeks after loop implementation. When the loop was completed, a second preloader was cross trained in the zip code, providing coverage for vacations. (Tables 7, 8, and 9)

TRAINING STREETS

	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
1	4	Chillicothe Rd South	1372	1799X	3		18
2	8	Chillicothe Rd South	1371	ONLY	1		25
3	12	Chillicothe Rd South	1250	1370X	3		10
4	16	Francis Kenneth Dr	1	999	1		11
5	20	Lena Dr	1	999	1		16
6	24	Danner Dr	1200	1500	4		13
7	36	Chillicothe Rd South	549	ONLY	10		131
8	84	Chillicothe Rd South	1	349X	10	10	33
9	140	Chamberlain Rd	11444	ONLY	1		16
10	176	Winchell Rd	1	3299		4	4
11	188	Edwards Lane	9900	10099		4	4
12	216	Circlewood Dr	500	999		6	6
13	220	Eggleston Rd	1	1099		5	6
14	236	Garfield Rd East	340	899	11	4	21
15	280	Pioneer Trail West	1	125	1	1	11
16	284	Aurora Rd South	1	999	5		6
17	296	Garfield Rd West	1	200	2		10
18	308	Garfield Rd West	251	ONLY	9		22
19	316	Garfield Rd East	1	339	8		26
20	320	Chillicothe Rd North	1	1099		4	4
21	328	Aurora Rd North	800	999	1		1
22	344	SEA WORLD PARK	1100	1100	1		43
23	368	GEUAGA LAKE PARK			1		15
24	400	Lloyd Rd	800	1299		6	7
25	508	Regatta Trail	9800	10299		1	1
26	536	Surfside Circle	1000	3999		1	5
27	700	Bissell Rd South	1	799	2	1	11
28	896	Chatam Dr	1	499		6	7
29	900	Chelmsford Dr	1	499		6	6
30	904	Greenbriar Dr	1	349		5	5
31	940	Aurora Huson Rd	1	500	4		5
32	976	Aurora Huson Rd	501	1599	4		7
A)		TOTAL IN ABOVE 32 STREETS			89	76	518
B)		TOTAL IN ENTIRE LOOP			101	217	756
C)		PERCENTAGE A/B*100			88	35 %	69 %

32 ABOVE SEQUENCE NUMBERS / 245 TOTAL SEQUENCE NUMBERS = 13 %

Table 5: Sequence number training.

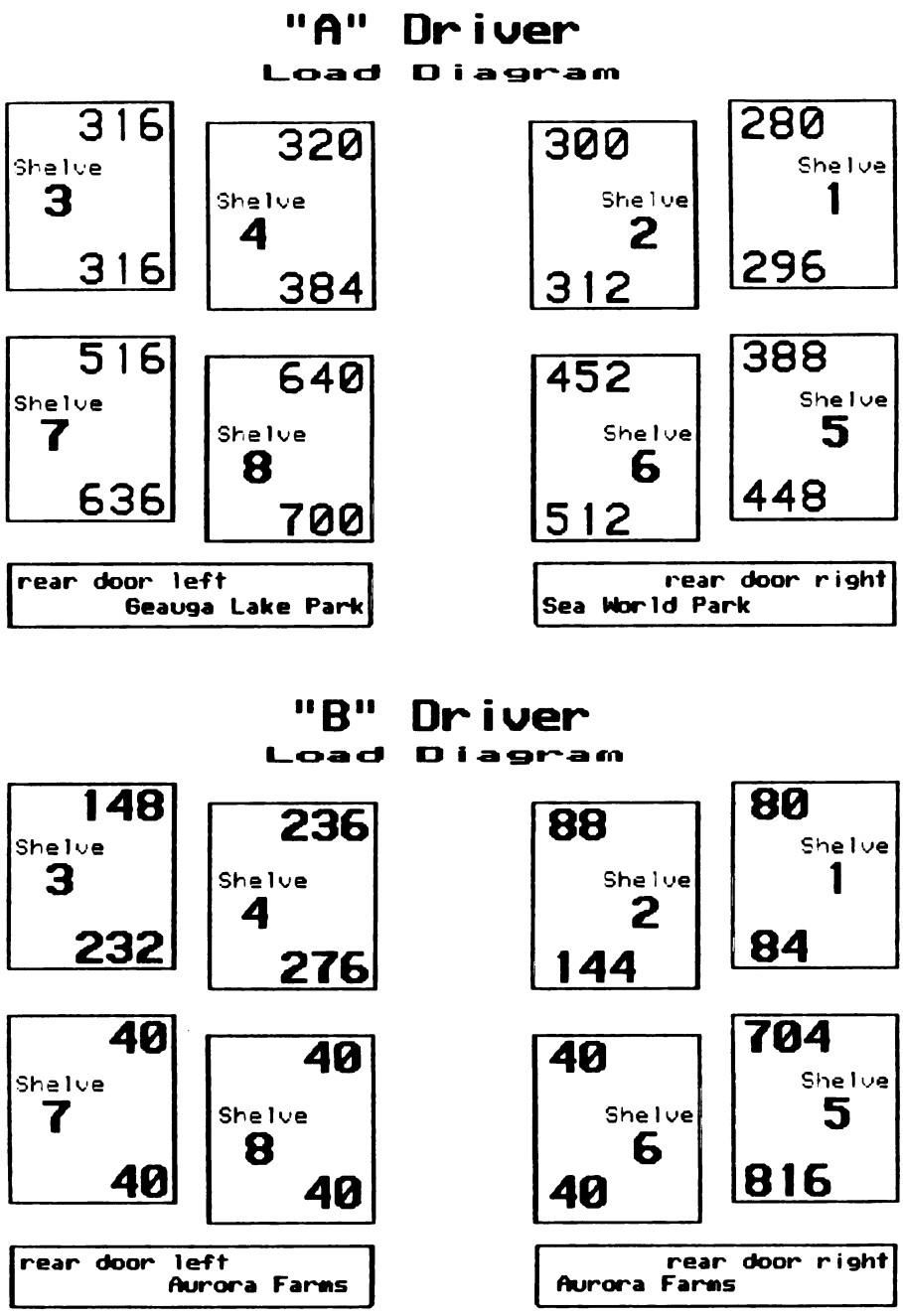


Figure 13: Car load diagrams.

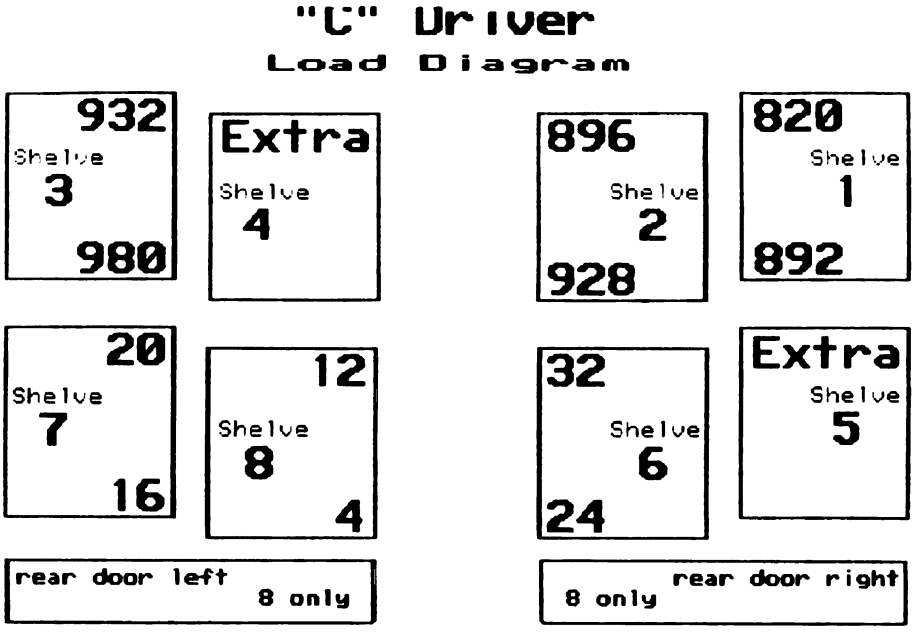


Figure 13: Continued.

SEQUENCE NUMBERS AND PACKAGE TOTALS PER VEHICLE SHELF

VEHICLE SHELVES	"A" DRIVER SEQUENCE # RANGE	"A" DRIVER TOTAL PACKAGES	"B" DRIVER SEQUENCE # RANGE	"B" DRIVER TOTAL PACKAGES	"C" DRIVER SEQUENCE # RANGE	"C" DRIVER TOTAL PACKAGES
1	280--296	30	80--84	34	820--892	22
2	300--312	22	88--144	34	896--928	27
3	316	26	148--232	51	932--980	28
4	320--384	32	236--276	37	EXTRA	XXX
5	388--448	21	704--816	31	EXTRA	XXX
6	452--512	20	40	30	24--32	17
7	516--636	38	40	30	16--20	27
8	640--700	17	40	30	4--12	28
REAR DOOR R	SEAWORLD 344	43	40	20	8 ONLY	12
REAR DOOR L	GEAUGA LK 368	15	40	21	8 ONLY	13
TOTAL PACKAGES		264		318		174

Table 7: Sequence number location with average volume.

SEQUENCE # SHIFTING WHEN TOTAL PACKAGE VOLUME IS LESS THAN AVERAGE

VEHICLE SHELVES	"A" DRIVER SEQUENCE # RANGE	"A" DRIVER TOTAL PACKAGES	"B" DRIVER SEQUENCE # RANGE	"B" DRIVER TOTAL PACKAGES	"C" DRIVER SEQUENCE # RANGE	"C" DRIVER TOTAL PACKAGES
1	280--296	30	80--84		820--892	22
2	300--312	22	88--144	34	896--928	27
3	316	26	148--232	51	932--980	28
4	320--384	32	236--276	37	EXTRA	XXX
5	388--448		704--816	31	EXTRA	XXX
6	452--512	20	40	30	24--32	17
7	516--636	38	40	30	16--20	27
8	640--700	17	40	30	4--12	28
REAR DOOR R	SEAWORLD 344	43	40	20	8 ONLY	12
REAR DOOR L	GEAUGA LK 368	15	40	21	8 ONLY	13

Table 8: Package shifting when package volume is low.

SEQUENCE # SHIFTING WHEN TOTAL PACKAGE VOLUME IS HIGHER THAN AVERAGE

VEHICLE SHELVES	"A" DRIVER SEQUENCE # RANGE	"A" DRIVER TOTAL PACKAGES	"B" DRIVER SEQUENCE # RANGE	"B" DRIVER TOTAL PACKAGES	"C" DRIVER SEQUENCE # RANGE	"C" DRIVER TOTAL PACKAGES
1	280--296	30	80--84		820--892	22
2	300--312	22	88--144	34	896--928	27
3	316	26	148--232	51	932--980	28
4	320--384	32	236--276	37	EXTRA	XXX
5	388--448		704--816	31	EXTRA	XXX
6	452--512	20	40	30	24--32	17
7	516--636	38	40	30	16--20	27
8	640--700	17	40	30	4--12	28
REAR DOOR R	SEAWORLD 344	43	40	20	8 ONLY	12
REAR DOOR L	GEAUGA LK 368	15	40	21	8 ONLY	13

Table 9: Package shifting when package volume is high.

CHAPTER 3: CONCLUSION

The United Parcel Service distribution center of Akron, Ohio was reorganized in an effort to increase production efficiencies and reduce customer claims. The zip code encompassing the town of Aurora, Ohio was used to illustrate how an area trace is developed. This area trace will be used as a dispatching tool for the various supervisors that will manage the center for the next ten years. Dispatching using zip code boundaries rather than geographical boundaries provides the stability required in preload operations while offering long term flexibility involved in new facility projections. Transportation economies may be sacrificed using zip code boundaries. However, reducing claims by minimizing package handling coupled with easier package tracing should offset any costs associated with dispatching by zip code.

"Overallowed" hours are considered excess cost within the operating center. Before reorganizing, Akron East was averaging .55 overallowed hours per driver on a daily basis. One month after the completion of the organization the overallowed hours decreased to .42 hours per driver. This .13 hour difference times the hourly rate of $16.78 accounts for a savings of $2.18 per driver each day. Extrapolating this savings for 28 drivers over a one year period amounts to $15,880.

One year after reorganization, the center is averaging .09 overallowed hours. This .48 hours difference extrapolates to a savings of $58,636 per year. A change in management personnel within this year may have played a part in reducing the excess hours. However, the new management found the use of the charts and diagrams essential when making the transition into the center.

Even though these tangible benefits were realized, other intangible

benefits were obtained. Perhaps the most important benefit was the ability to better service business customers. The drivers that had exclusively residential deliveries acquired business deliveries from the drivers who did not have any residential deliveries. This allows for most business stops to be delivered before noon. This provides those businesses who operate within time constraints to turn merchandise around for shipping the same day. This is important for just-in-time philosophies and inventory reduction.

The preload management enjoyed another intangible benefit: easier cross training thus minimizing job specialties. Before reorganization, the sorters were skilled employees who were required to know all individual streets within the Akron area. Using zip codes to sort requires less reading of the address and allows for less skilled people to fill this position, contributing to higher production rates. Sorting by zip code decreases the likelihood of a "missorted" package, i.e., one that is not placed in the right color cage within the boxline or in the proper delivery vehicle. This minimizes handling, which decreases the chance of product damage.

Finally, the driver's confidence in the preloader's ability to properly place the package for delivery in the vehicle increased. The driver will not need to search through his package car in the morning looking for those misplaced packages that will require backtracking to deliver. Substitute drivers can follow the package flow in the vehicle in determining which delivery stop is next. Proper recording of packages in the unit that the tracing department will be searching, upon shipper's request, will reduce claims.

Use of the "loop concept" of dispatching is not limited to small package delivery. Any business that experiences rapid volume fluctuations and requires

dispatching of personnel on a daily basis can use this methodology. It can be applied to a sales force or the dispatching of a service fleet. The principle is not restricted to zip codes but can include territories such as metropolitan areas, counties, or states.

APPENDICES

ZIP CODE 44202
DELIVER STOPS

STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
Acadia Point	500	999			
Acadia Point East	500	699			
Acadia Point West	600	799			
Ancorage Cove	10100	10299			
Antler Point	1	599			
Appoloosa Run	1	10000			
Arbor Way Dr	600	799			
Aurora Hill Dr	900	1299			
Aurora Huson Rd	1	1599			
Aurora Rd	7000	7399			
Aurora Rd North	1	1099			
Aurora Rd South	1	999			
Beaver Trail	3300	3499			
Beech Ct	1	999			
Ben Shaw Rd	1	999			
Benning Dr	2600	2900			
Bent Tree	300	499			
BentCreek Oval	1	699			
Birch Bark Dr	1	9999			
Bissell Rd North	1	399			
Bissell Rd South	1	799			
Bounty Rd	500	699			
Bramble Ln	400	499			
Brandon Circle	800	999			
Brewster Rd	18800	19999			
Briarcliff Dr	600	799			
Brookfield Rd	19000	19999			
Brice Ave	800	1299			
Buck Crossing	1	599			
California St	10000	10699			
Cambridge Dr	100	399			
Carriage Square	1	99			
Cascade Ct	19100	19200			
Castaway Cove	9900	10999			
Cedar Ridge	400	499			
Chamberlain Rd	11100	11443			
Chandler Dr	400	499			
Chandler Lane	600	899			
Chandler Path	400	499			
Chatam Dr	1	499			
Chelmsford Dr	1	499			
Cherrypark Oval	1	9999			
Chillicothe Rd North	1	1099			
Chillicothe Rd South	1	1799			
Chillicothe Rd South	549	549			

Table 1: Alphabtical listing of Aurora's streets.

ZIP CODE 44202
DELIVER STOPS

STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
Circlewood Dr	500	999			
Claridge Lane	600	799			
Clipper Cove	10100	10399			
Club House Drive	1	9999			
Cobblestone Rd	1	699			
Cochran Rd	1	600			
Colony Dr	800	1099			
Commodore Cove East	3700	3899			
Commodore Cove West	3700	3899			
Concord Downs Ln	300	599			
Concord Downs Path	300	599			
Connecticut St	10400	10699			
Crackle Rd	1	10099			
Creekside Dr	400	799			
Cross Creek Ln	500	599			
Crows Nest Cove	9900	10299			
Danner Dr	1200	1500			
Deep Woods Dr	1	899			
Deer Island Dr	1	599			
Deer Path	1	599			
Deer Run	1	599			
Delaware Trail	1	599			
Depot Dr	1	9999			
Devorah Dr	1	299			
Dogwood Trail	100	299			
Dolphin Dr	1	9999			
Dora Lane	600	999			
Driftwood Cove	9900	10099			
East Blvd	1	3899			
Edwards Lane	9900	10099			
Eggleston Rd	1	1099			
Eldridge Rd	1	499			
Elizabeth Dr	18800	19999			
Ensign Cove	3400	3499			
Fairington Dr	600	799			
Fairington Lane	600	1399			
Fairington Oval	600	899			
Fairview Dr	600	1099			
Florida St	10400	10699			
Fox Run Trail	1	599			
Francis Kenneth Dr	1	999			
Garfield Rd East	1	3090			
Garfield Rd West	1	1299			
Georgia St	10400	10699			
Glen Eden Dr	600	799			

Table 1: Continued.

ZIP CODE 44202
DELIVER STOPS

STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
Glenview Dr	1	599			
Glenwood Blvd	3300	10599			
Greenbriar Dr	1	399			
Hampton Circle	1	9999			
Hanes Lane	1	199			
Harmon Rd	1	299			
Hawthorn Dr	100	499			
Heather Lane	400	499			
Hedgecliff Dr	100	299			
Heritage Rd	300	499			
Hideaway Cove	9900	10999			
Hill Dr	300	499			
Honeysuckle Path	300	499			
Hurd Rd	1	299			
Illinois St	10400	10699			
Inlet Point	10000	10699			
Ironwood Circle	1	9999			
Jackson Dr	200	599			
Kimberly Dr	400	699			
Knollwood Dr	300	499			
Lake Ave	900	3699			
Laural Circle	200	299			
Lena Dr	1	999			
Lloyd Rd	800	1299			
Lori Ln	7700	7899			
Loris Ave	11000	11399			
Maple St	1	99			
Martin Lane	400	899			
Maryland Ave	10400	10699			
McRoberts	600	899			
Meadowview	400	499			
Mennonite Rd East	1	1299			
Mennonite Rd West	1	299			
Michigan Ave	800	1199			
Mill Pond Rd	1	499			
Mohawk Trail	1	599			
Moneta Ave	800	1299			
Munn Rd	18900	19199			
Mustang Pass	800	899			
Nautilus Trail	500	3899			
New Hudson Rd	1	499			
Nicola Dr	400	1299			
North Pine Dr	1	9899			
Oak Hollow Dr	300	599			
Ohio Ave	800	1199			
Old Barn Dr	900	10099			

Table 1: Continued.

ZIP CODE 44202
DELIVER STOPS

STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
Old Mill Rd	700	1099			
Orchard Ave	800	1299			
Outriggers Cove	9900	10999			
Overlook Dr	300	699			
Oxford Dr	200	299			
Page Rd	500	999			
Palomino Trail	300	599			
Park Dr North	1	399			
Park Dr South	1	399			
Parker Rd	400	1099			
Parkview Dr	1	399			
Parkview Dr South	400	999			
Pebble Beach Cove	9800	10099			
Pennsylvania St	800	1199			
Pioneer Trail East	1	3099			
Pioneer Trail West	1	699			
Pirates Cove	1	9999			
Pirates Trail	9900	10999			
Pond Run	300	699			
Red Fawn Path	1	599			
Regatta Trail	9800	10299			
Ridgeway Dr	400	999			
Riley Rd	100	1399			
Riverside Dr	5900	8100			
Robinwood Dr	400	899			
Russett Woods Ct	500	999			
Russett Woods Ln	500	999			
Sea Bay Cove	3600	3799			
Sea World Dr	900	1099			
Sea World Park	1100	1100			
Seneca Dr	1	599			
Shagbark Rd	1	9999			
Shawnee Trail	1	299			
Sherwood Dr	400	899			
Skipper Cove	3700	3799			
Smugglers Cove	10200	10399			
South Pine Ct	1	9999			
Spinnaker Run	10000	10599			
State Rt 82	900	3090			
Sue Ct	1100	1399			
Summitt Rd	18900	18999			
Surfside Circle	1000	3999			
Surfside Circle North	10000	10299			
Timberlane Dr	1	199			
Town Line Rd	1	799			

Table 1: Continued.

ZIP CODE 44202
DELIVER STOPS

STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
Tradewinds Dr	9900	10999			
Trails End	1	499			
Treat Rd	100	499			
Waldon Dr	1	9999			
Wheatfield Dr	300	899			
White Tail Dr	1	599			
Willow Circle	400	599			
Willyard dr	1	699			
Winchell Rd	1	3299			
Windjammer Cove	3500	3799			
Windjammer Trail	9900	11099			
Windward Circle	1	9999			
Windward Dr	300	899			
Windward Ln	1	9999			

Table 1: Continued.

DELIVER ORDER LISTING

UNIT #	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
2001	4	Chillicothe Rd South	1372	1799X	3		18
2001	8	Chillicothe Rd South	1371	ONLY	1		25
2001	12	Chillicothe Rd South	1250	1370X	3		10
2001	16	Francis Kenneth Dr	1	999	1		11
2001	20	Lena Dr	1	999	4		16
2001	24	Danner Dr	1200	1500	4		13
2001	28	Mennonite Rd East	1	1299		3	3
2001	32	Chillicothe Rd South	550	1249X		1	1
2003	40	Chillicothe Rd South	549	ONLY	10		131
2003	40A	WALLET WORKS	549	ONLY			
2003	40B	CARTERS CHILDRENS	549	ONLY			
2003	40C	RIBBON OUTLET	549	ONLY			
2003	40D	AILEENS	549	ONLY			
2003	40E	SALEM CHINA	549	ONLY			
2003	40F	FARKAS MEATS	549	ONLY			
2003	40G	AURORA FURNATURE	549	ONLY			
2003	40H	WAYSIDE WORKSHOP	549	ONLY			
2003	40I	VAN HEUSEN	549	ONLY			
2003	40J	CORNING WEAR	549	ONLY			
2003	80	Chillicothe Rd South	350	548X	1		1
2003	84	Chillicothe Rd South	1	349X	10	10	33
2003	88	Pioneer Trail East	1	799		2	2
2003	92	Page Rd	500	999			
2003	96	Willyard dr	1	699		3	4
2003	100	Ben Shaw Rd	1	999			
2003	104	Heritage Rd	300	499		1	1
2003	108	Fox Run Trail	1	599		1	1
2003	112	Mill Pond Rd	1	499		1	1
2003	116	Bounty Rd	500	699			
2003	120	Cobblestone Rd	1	699			
2003	124	New Hudson Rd	350	499	1		1
2003	128	Pioneer Trail East	800	3099		2	2
2003	132	Loris Ave	11000	11399		3	3
2003	136	Chamberlain Rd	11100	11443	1		3
2003	140	Chamberlain Rd	11444	ONLY	1		16
2003	144	CARLON PRODUCTS	11444	ONLY			
2003	148	Chamberlain Rd	11445	12499	1	1	4
2003	152	Garfield Rd East	900	3090	1		6
2003	156	State Rt 82	900	3090			
2003	160	Town Line Rd	1	799		2	3
2003	164	Benning Dr	2600	2900		1	3
2003	168	Nicola Dr	400	1299			
2003	172	Deep Woods Dr	1	899			1
2003	176	Winchell Rd	1	3299		4	4
2003	180	Chamberlain Rd	12500	13099	2		5

Table 3: Delivery order listing.

DELIVER ORDER LISTING CONTINUED

UNIT #	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
2003	184	Munn Rd	18900	19199			
2003	188	Edwards Lane	9900	10099		4	4
2003	192	Crackle Rd	1	10099			
2003	196	Brookfield Rd	19000	19999		1	1
2003	200	Parker Rd	400	1099		1	3
2003	204	Palomino Trail	300	599			
2003	208	Mustang Pass	800	899		1	1
2003	212	Appoloosa Run	1	10000			
2003	216	Circlewood Dr	500	999		6	6
2003	220	Eggleston Rd	1	1099		5	6
2003	224	Jackson Dr	200	599		1	2
2003	228	Hanes Lane	1	199		1	2
2003	232	Sue Ct	1100	1399			
2003	236	Garfield Rd East	340	899	1	4	21
2003	240	Glenview Dr	1	599	1	1	3
2003	244	Seneca Dr	1	599			
2003	248	Mohawk Trail	1	599			
2003	252	Delaware Trail	1	599		3	3
2003	256	New Hudson Rd	1	349	1		1
2003	260	Trails End	1	499			
2003	264	Hurd Rd	1	299		1	3
2003	268	Harmon Rd	1	299		3	3
2003	272	Shawnee Trail	1	299		3	3
2003	276	Eldridge Rd	1	499		1	
2005	280	Pioneer Trail West	1	125	1	4	14
2005	284	Aurora Rd South	1	999	5		6
2005	288	Maple St	1	99			
2005	292	Aurora Rd North	1	799			
2005	296	Garfield Rd West	1	200	2		10
2005	300	NEW MALL NOT OPEN	201	250			
2005	304	Garfield Rd West	201	250			
2005	308	Garfield Rd West	251	ONLY	9		22
2005	312	AURORA COMMONS	251	ONLY			
2005	316	Garfield Rd East	1	339	8		26
2005	320	Chillicothe Rd North	1	1099		4	4
2005	324	Treat Rd	100	499	2		11
2005	328	Aurora Rd North	800	999	4		4
2005	332	McRoberts	600	899			
2005	336	Fairview Dr	600	1099			
2005	340	Sea World Dr	900	1099			
2005	344	Sea World Park	1100	1100	1		43
2005	348	Elizabeth Dr	18800	19999			
2005	352	Cascade Ct	19100	19200		1	1
2005	356	Riverside Dr	5900	8100		2	3
2005	360	Lori Ln	7700	7899			

Table 3: Continued.

DELIVER ORDER LISTING CONTINUED

UNIT #	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
2005	364	Brewster Rd	18800	19999		1	1
2005	368	GEUAGA LAKE PARK			1		15
2005	372	Depot Dr	1	9999			2
2005	376	Summit Rd	18900	18999			
2005	380	Aurora Rd	7000	7399	2		3
2005	384	Aurora Rd North	1000	1099	2		3
2006	388	Lake Ave	900	3699	1		5
2006	392	East Blvd	1	3899			
2006	396	Brice Ave	800	1299		1	1
2006	400	Lloyd Rd	800	1299		6	7
2006	404	Orchard Ave	800	1299		1	1
2006	408	Moneta Ave	800	1299		3	4
2006	412	California St	10000	10699		1	1
2006	416	Pennsylvania St	800	1199			
2006	420	Michigan Ave	800	1199			
2006	424	Ohio Ave	800	1199		1	1
2006	428	Dora Lane	600	999			
2006	432	Florida St	10400	10699			
2006	436	Maryland Ave	10400	10699			
2006	440	Connecticut St	10400	10699			
2006	444	Georgia St	10400	10699		1	1
2006	448	Illinois St	10400	10699			
2006	452	Glenwood Blvd	3300	10599			
2006	456	Ensign Cove	3400	3499			
2006	460	Beaver Trail	3300	3499		2	2
2006	464	Spinnaker Run	10000	10599		3	3
2006	468	Nautilus Trail	3400	3650		2	4
2006	472	Pirates Trail	9900	10999			
2006	476	Pirates Cove	2900	3099			
2006	480	Castaway Cove	9900	10999			
2006	484	Outriggers Cove	9900	10999			
2006	488	Hideaway Cove	9900	10999			
2006	492	Tradewinds Dr	9900	10999			
2006	496	Dolphin Dr	1	9999			
2006	500	Driftwood Cove	9900	10099		2	2
2006	504	Smugglers Cove	10200	10399		2	2
2006	508	Regatta Trail	9800	10299		4	4
2006	512	Windjammer Cove	3500	3799		3	3
2006	516	Windjammer Trail	9900	11099			
2006	520	Sea Bay Cove	3600	3799		3	3
2006	524	Crows Nest Cove	9900	10299		1	2
2006	528	Inlet Point	10000	10699		1	1
2006	532	Surfside Circle North	10000	10299		1	1
2006	536	Surfside Circle	1000	3999		4	5
2006	540	Pebble Beach Cove	9800	10099		1	1

Table 3: Continued.

DELIVER ORDER LISTING CONTINUED

UNIT #	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
2006	544	Clipper Cove	10100	10399		3	4
2006	548	Ancorage Cove	10100	10299		2	2
2006	552	Nautilus Trail	3651	3899		1	1
2006	556	Commodore Cove West	3700	3899	1	2	3
2006	560	Skipper Cove	3700	3799		1	1
2006	564	Commodore Cove East	3700	3899		2	3
2006	568	Nautilus Trail	500	899		1	1
2006	572	Cherrypark Oval	1	9999			
2006	576	Hawthorne Blvd	1	9999			
2006	580	Hawthorne Trail	1	9999			
2006	584	Old Hickory Trail	1	9999			
2006	588	Plumcreek rd	1	9999			
2006	592	Owlesroost Cove	1	9999			
2006	596	Oakleaf Oval	1	9999			
2006	600	Dearhaven Trail	1	9999			
2006	604	Glen Oak Dr	1	9999			
2006	608	Bramblebush Ln	1	9999			
2006	612	Rock Creek Dr	1	9999			
2006	616	Stone Hill Oval	1	9999			
2006	620	Falling Leaves Dr	1	9999			
2006	624	Walnut Ridge Trail	1	9999			
2006	628	Bissell Rd North	1	399			
2006	632	Robinwood Dr	400	899		3	6
2006	636	Sherwood Dr	400	899	1	2	4
2006	640	Martin Lane	400	899			
2006	644	Garfield Rd West	252	1299	1	1	2
2006	648	Cochran Rd	1	600			
2006	652	Colony Dr	800	1099		1	
2006	656	Cambridge Dr	100	399			
2006	660	Riley Rd	100	1399			
2006	664	Aurora Hill Dr	900	1299			
2006	668	Oxford Dr	200	299			
2006	672	Hedgecliff Dr	100	299		1	1
2006	676	Pioneer Trail West	126	699			
2004	680	Birch Bark Dr	1	9999			
2004	688	North Pine Dr	1	9899			
2004	692	Ironwood Circle	1	9999			
2004	696	Beech Ct	1	999			
2004	700	Bissell Rd South	1	799	2	4	14
2004	704	Waldon Dr	1	9999	1		8
2004	708	Brandon Circle	800	999			
2004	712	Claridge Lane	600	799			
2004	716	Creekside Dr	400	799		1	
2004	720	Acadia Point	500	999		2	3
2004	724	Acadia Point East	500	699			

Table 3: Continued.

DELIVER ORDER LISTING CONTINUED

UNIT #	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
2001	728	Acadia Point West	600	799			
2001	732	Glen Eden Dr	600	799			2
2001	736	Cross Creek Oval	600	799			
2004	740	Cross Creek Ln	500	599		1	1
2004	744	Russett Woods Ln	500	999		4	5
2004	748	Russett Woods Ct	500	999			
2004	752	Arbor Way Dr	600	799		1	1
2004	756	Fairington Dr	600	799		2	2
2004	760	Fairington Lane	600	1399			
2004	764	Fairington Oval	600	899		2	
2004	768	Deer Island Dr	1	599			5
2004	772	Buck Crossing	1	599		1	1
2004	776	Deer Run	1	599			
2004	780	Antler Point	1	599			
2004	784	Deer Path	1	599			
2004	788	White Tail Dr	1	599		2	3
2004	792	Red Fawn Path	1	599			
2004	796	Club House Drive	1	9999			
2004	800	Chandler Path	400	499			
2004	804	Chandler Lane	600	899			
2004	808	Chandler Dr	400	499			
2004	812	Windward Ln	1	9999			
2004	816	Windward Dr	300	899			
2004	820	Windward Circle	1	9999		2	2
2004	824	Hawthorn Dr	100	499			
2004	828	Laural Circle	200	299			
2004	832	Dogwood Trail	100	299		1	1
2004	836	Honeysuckle Path	300	499		4	4
2004	840	BentCreek Oval	1	699		1	1
2004	844	Ridgeway Dr	400	999			
2004	848	Bramble Ln	400	499		3	3
2004	852	Meadowview	400	499		1	1
2004	856	Cedar Ridge	400	499			
2004	860	Heather Lane	400	499			
2004	864	Concord Downs Ln	300	599		1	1
2004	868	Willow Circle	400	599			
2004	872	Concord Downs Path	300	599	1	3	4
2004	876	Pond Run	300	699			
2004	880	Concord Downs Circle	300	599			
2004	884	Hill Dr	300	499		1	1
2004	888	Knollwood Dr	300	499		1	2
2004	892	Overlook Dr	300	699		1	2
2006	896	Chatam Dr	1	499		6	7
2006	900	Chelmsford Dr	1	499		6	6
2006	904	Greenbriar Dr	1	399		5	5

Table 3: Continued.

DELIVER ORDER LISTING CONTINUED

UNIT #	SEQ #	STREET NAME	LOW RANGE	HIGH RANGE	SIGNATURE	RELEASE	PACKAGES
2006	908	Briarcliff Dr	600	799			
2006	912	Parkview Dr	1	399		2	2
2006	916	Carriage Square	1	99		1	1
2006	920	Parkview Dr South	400	999		3	4
2006	924	Deborah Dr	1	299		1	1
2006	928	Timberlane Dr	1	199		1	1
2006	932	Park Dr South	1	399			
2006	934	South Pine Ct	1	9999			
2006	936	Park Dr North	1	399		1	8
2006	940	Aurora Huson Rd	1	500	4		5
2006	944	Mennonite Rd West	1	299			
2006	948	Hampton Circle	1	9999			
2006	952	Bent Tree	300	499			
2006	956	Oak Hollow Dr	300	599			
2006	960	Wheatfield Dr	300	899	1	2	3
2006	964	Old Barn Dr	900	10099		2	2
2006	968	Old Mill Rd	700	1099		2	3
2006	972	Shagbark Rd	1	9999			
2006	976	Aurora Huson Rd	501	1599	4		7
2006	980	Kimberly Dr	400	699			
				TOTAL	101	217	756

Table 3: Continued.

ALPHABETICAL LISTING

STREET NAME	LOW RANGE	HIGH RANGE	SEQUEN NUMBER
Acadia Point	500	999	720
Acadia Point East	500	699	724
Acadia Point West	600	799	728
AILEENS	549	ONLY	40E
Ancorage Cove	10100	10299	548
Antler Point	1	599	780
Appoloosa Run	1	10000	212
Arbor Way Dr	600	799	752
AURORA COMMONS	251	ONLY	312
AURORA FURNATURE	549	ONLY	40H
Aurora Hill Dr	900	1299	664
Aurora Huson Rd	1	500	940
Aurora Huson Rd	501	1599	976
Aurora Rd	7000	7399	380
Aurora Rd North	1	799	292
Aurora Rd North	800	999	328
Aurora Rd North	1000	1099	384
Aurora Rd South	1	999	284
Beaver Trail	3300	3499	460
Beech Ct	1	999	696
Ben Shaw Rd	1	999	100
Benning Dr	2600	2900	164
Bent Tree	300	499	952
BentCreek Oval	1	699	840
Birch Bark Dr	1	9999	680
Bissell Rd North	1	399	628
Bissell Rd South	1	799	700
Bounty Rd	500	699	116
Bramble Ln	400	499	848
Bramblebush Ln	1	9999	608
Brandon Circle	800	999	708
Brewster Rd	18800	19999	364
Briarcliff Dr	600	799	908
Brice Ave	800	1299	396
Brookfield Rd	19000	19999	196
Buck Crossing	1	599	772
California St	10000	10699	412
Cambridge Dr	100	399	656
CARLON PRODUCTS	11444	ONLY	144
Carriage Square	1	99	916
CARTERS CHILDRENS	549	ONLY	40C
Cascade Ct	19100	19200	352
Castaway Cove	9900	10999	480
Cedar Ridge	400	499	856
Chamberlain Rd	11100	11443	136
Chamberlain Rd	11444	ONLY	140
Chamberlain Rd	11445	12499	148
Chamberlain Rd	12500	13099	180
Chandler Dr	400	499	808
Chandler Lane	600	899	804
Chandler Path	400	499	800
Chatam Dr	1	499	896
Chelmsford Dr	1	499	900
Cherrypark Oval	1	9999	572
Chillicothe Rd North	1	1099	320
Chillicothe Rd South	1	349X	84
Chillicothe Rd South	350	548X	80
Chillicothe Rd South	549	ONLY	40
Chillicothe Rd South	550	1249X	32
Chillicothe Rd South	1250	1370X	12
Chillicothe Rd South	1371	ONLY	8
Chillicothe Rd South	1372	1799X	4
Circlewood Dr	500	999	216
Claridge Lane	600	799	712
Clipper Cove	10100	10399	544
Club House Drive	1	9999	796
Cobblestone Rd	1	699	120
Cochran Rd	1	600	648
Colony Dr	800	1099	652
Commodore Cove East	3700	3899	564
Commodore Cove West	3700	3899	556
Concord Downs Circle	300	599	880
Concord Downs Ln	300	599	864
Concord Downs Path	300	599	872
Connecticut St	10400	10699	440
CORNING WEAR	549	ONLY	40K
Crackle Rd	1	10099	192
Creekside Dr	400	799	716
Cross Creek Ln	500	599	740
Cross Creek Oval	600	799	736
Crows Nest Cove	9900	10299	524

Table 6: Alphabetical street listing.

ALPHABETICAL LISTING

STREET NAME	LOW RANGE	HIGH RANGE	SEQUEN NUMBER
D D D D D D D D D D D D D D D D D D D D			
Danner Dr	1200	1500	24
Dearhaven Trail	1	9999	600
Deborah Dr	1	299	925
Deep Woods Dr	1	899	172
Deer Island Dr	1	599	768
Deer Path	1	599	784
Deer Run	1	599	776
Delaware Trail	1	599	252
Depot Dr	1	9999	372
Dogwood Trail	100	299	832
Dolphin Dr	1	9999	496
Dora Lane	600	999	428
Driftwood Cove	9900	10099	500
E E E E E E E E E E E E E E E E E E E E			
East Blvd	1	3899	392
Edwards Lane	9900	10099	188
Eggleston Rd	1	1099	220
Eldridge Rd	1	499	276
Elizabeth Dr	18800	19999	348
Ensign Cove	3400	3499	456
F F F F F F F F F F F F F F F F F F F F			
Fairington Dr	600	799	756
Fairington Lane	600	1399	760
Fairington Oval	600	899	764
Fairview Dr	600	1099	336
Falling Leaves Dr	1	9999	620
FARKAS MEATS	549	ONLY	40G
Florida St	10400	10699	432
Fox Run Trail	1	599	108
Francis Kenneth Dr	1	999	16
G G G G G G G G G G G G G G G G G G G G			
Garfield Rd East	1	339	316
Garfield Rd East	340	899	236
Garfield Rd East	900	3090	152
Garfield Rd West	1	200	296
Garfield Rd West	201	250	304
Garfield Rd West	251	ONLY	308
Garfield Rd West	252	1299	644
Georgia St	10400	10699	444
GEUAGA LAKE PARK			368
Glen Eden Dr	600	799	732
Glen Oak Dr	1	9999	604
Glenview Dr	1	599	240
Glenwood Blvd	3300	10599	452
Greenbriar Dr	1	399	904
H H H H H H H H H H			
Hawthorn Dr	100	499	824
Hawthorne Blvd	1	9999	576
Hawthorne Trail	1	9999	580
Heather Lane	400	499	860
Hedgecliff Dr	100	299	672
Heritage Rd	300	499	104
Hideaway Cove	9900	10999	488
Hill Dr	300	499	884
Honeysuckle Path	300	499	836
Hurd Rd	1	299	264
I I I I I I I I I I I I I I I I I I I I			
Illinois St	10400	10699	448
Inlet Point	10000	10699	528
Ironwood Circle	1	9999	692
J J J J J J J J J J J J J J J J J J J J			
Jackson Dr	200	599	224
K K K K K K K K K K K K K K K K K K K K			
Kimberly Dr	400	699	980
Knollwood Dr	300	499	888
L L L L L L L L L L L L L L L L L L L L			
Lake Ave	900	3699	388
Laural Circle	200	299	828
Lena Dr	1	999	20
Lloyd Rd	800	1299	400
Lori Ln	7700	7899	360
Loris Ave	11000	11399	132
M M M M M M M M M M M M M M M M M M M M			
Maple St	1	99	288
Martin Lane	400	899	640
Maryland Ave	10400	10699	436
McRoberts	600	899	332
Meadowview	400	499	852
Mennonite Rd East	1	1299	28
Mennonite Rd West	1	299	944
Michigan Ave	800	1199	420
Mill Pond Rd	1	499	112
Mohawk Trail	1	599	248
Moneta Ave	800	1299	408
Munn Rd	18900	19199	184
Mustang Pass	800	899	208
N N N N N N N N N N N N N N N N N N N N			
Nautilus Trail	500	899	568
Nautilus Trail	3400	3650	468
Nautilus Trail	3651	3899	552
New Hudson Rd	1	349	256
New Hudson Rd	350	499	124
NEW MALL NOT OPEN	201	250	300
Nicola Dr	400	1299	168
North Pine Dr	1	9899	688

Tablel 6: Continued.

ALPHABETICAL LISTING

STREET NAME	LOW RANGE	HIGH RANGE	SEQUEN NUMBER
O O O O O O O O O O O O O O O O O O O O			
Oak Hollow Dr	300	599	956
Oakleaf Oval	1	9999	596
Ohio Ave	800	1199	424
Old Barn Dr	900	10099	964
Old Hickory Trail	1	9999	584
Old Mill Rd	700	1099	968
Orchard Ave	800	1299	404
Outriggers Cove	9900	10999	484
Overlook Dr	300	699	892
Owlesroost Cove	1	9999	592
Oxford Dr	200	299	668
P P P P P P P P P P P P P P P P P P P P			
Page Rd	500	999	92
Palomino Trail	300	599	204
Park Dr North	1	399	936
Park Dr South	1	399	932
Parker Rd	400	1099	200
Parkview Dr	1	399	912
Parkview Dr South	400	999	920
Pebble Beach Cove	9800	10099	540
Pennsylvania St	800	1199	416
Pioneer Trail East	1	799	88
Pioneer Trail East	800	3099	128
Pioneer Trail West	1	125	280
Pioneer Trail West	126	699	676
Pirates Cove	2900	3099	476
Pirates Trail	9900	10999	472
Plumcreek rd	1	9999	588
Pond Run	300	699	876
R R R R R R R R R R R R R R R R R R R R			
Red Fawn Path	1	599	792
Regatta Trail	9800	10299	508
RIBBON OUTLET	549	ONLY	40D
Ridgeway Dr	400	999	844
Riley Rd	100	1399	660
Riverside Dr	5900	8100	356
Robinwood Dr	400	899	632
Rock Creek Dr	1	9999	612
Russett Woods Ct	500	999	748
Russett Woods Ln	500	999	744
S S S S S S S S S S S S S S S S S S S S			
SALEM CHINA	549	ONLY	40F
Sea Bay Cove	3600	3799	520
Sea World Dr	900	1099	340
Sea World Park	1100	1100	344
Seneca Dr	1	599	244
Shagbark Rd	1	9999	972
Shawnee Trail	1	299	272
Sherwood Dr	400	899	636
Skipper Cove	3700	3799	560
Smugglers Cove	10200	10399	504
South Pine Ct	1	9999	640
Spinnaker Run	10000	10599	464
State Rt 82	900	3090	156
Stone Hill Oval	1	9999	616
Sue Ct	1100	1399	232
Summit Rd	18900	18999	376
Surfside Circle	1000	3999	536
Surfside Circle North	10000	10299	532
T T T T T T T T T T T T T T T T T T T T			
Timberlane Dr	1	199	928
Town Line Rd	1	799	160
Tradewinds Dr	9900	10999	492
Trails End	1	499	260
Treat Rd	100	499	324
V V V V V V V V V V V V V V V V V V V V			
VAN HEUSEN	549	ONLY	40J
W W W W W W W W W W W W W W W W W W W W			
Waldon Dr	1	9999	704
WALLET WORKS	549	ONLY	40B
Walnut Ridge Trail	1	9999	624
WAYSIDE WORKSHOP	549	ONLY	401
Wheatfield Dr	300	899	960
White Tail Dr	1	599	788
Willow Circle	400	599	868
Willyard dr	1	699	96
Winchell Rd	1	3299	176
Windjammer Cove	3500	3799	512
Windjammer Trail	9900	11099	516
Windward Circle	1	9999	820
Windward Dr	300	899	816
Windward Ln	1	9999	812

Table 6: Continued.

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