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# SYSTEMS FOR HANDLING GROCERY PRODUCTS FROM SUPPLIER TO DISTRIBUTION WAREHOUSE

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## Background of Study

In the previous report of driver and tractor-trailer delays for grocery deliveries (contract #E-13186-ARS-75) studies were conducted at four warehouses, each having a different procedure for scheduling grocery truck receipts as follows:

- a. All truck receipts are scheduled as to arrival time.
- b. Truck receipts were not scheduled.
- c. Truck receipts were not scheduled except priority was given to unitized loads.

The report concluded that an appointment system where all appointments are made for the time when the dock opens will not reduce total waiting time. A central check-in station for drivers where all purchase orders are well organized, with both "ti and hi" and pallet size instructions, will reduce driver waiting time. Factors other than whether the trucks are scheduled or not may be of equal significance to an appointment system. A warehouse with sufficient doors to handle peak receivings will reduce the delay for a door assignment. The use of backhauls will give dock personnel more flexibility in balancing the work load. A dock with an adequate staging area and equipment to clear the product from staging to

permanent storage eliminates congestion at the receiving doors.

The total cost of waiting varied considerably and was apparently not related to an appointment system. This cost varied from 83¢ to \$2.62 per truck receiving.

The report recommended that the best method of evaluating the effectiveness of an appointment system would be a "before and after" study, in one firm. One of the cooperating firms was planning to convert to the appointment system. Additional studies of grocery receivings were made in this firm prior to the installation of the appointment system. When the system was operating effectively, studies were conducted for an equal number of truck receivings. The results of the "before and after" study are detailed in this report.

## Methodology

In the firm which was converting to the appointment system, a minimum of 25 additional truck receivings were made between 5:00 AM and noon on peak truck receiving days; typically Monday through Wednesday, before the appointment system became effective. The following information was recorded:

- a. The arrival time of each inbound trailer, in the firm's gate.

- b. The time elapsed between arrival and park at a grocery receiving door.
- c. The time trailer unloading begins.
- d. Any unusual waiting time.

After initiation of the truck scheduling program, the information specified in a- through d- was obtained for a minimum of 75 truck arrivals, from Monday through Wednesday. The same labor rates and equipment costs were used as in the previous study.

### Discussion

A total of 94 truck arrivals were recorded prior to initiation of the appointment system and 84 truck arrivals were recorded after the system was installed. During the observation of the receivings and the analysis of the data, it was determined that the waiting time for supplier trucks and the firm's backhaul trucks were significantly different. The backhaul trucks were parked at the receiving door for up to three hours before unloading. It was decided that the waiting time for the two types of receivings; supplier and backhaul trucks, should be reported separately. This separation had no effect on the evaluation of the appointment system since the total waiting time for the backhaul trucks was almost identical in the before and after studies. It was virtually impossible to obtain an adjusted waiting time for the backhaul trucks because the observers could not determine whether the waiting time was due to the lack of equipment and personnel for unloading or due to balancing the receiving workload.

As in the previous study; the four firms actual and adjusted times were reported for driver and tractor-trailer, the same procedure was used in this report. Where the observers determined

that the delay was not relevant to the study, it was underscored and omitted from the comparison of the before and after study. These delays and the reason for them are detailed on the summary sheets.

### Cost of Driver and Tractor-Trailer Waiting Time

The installation of the appointment system in Firm #3 reduced the actual waiting time for supplier trucks by 8.47 minutes (33%) and the adjusted waiting time by 6.17 minutes (31%), Table #1. There was no significant difference in the waiting time for the backhaul trucks.

The total cost of driver and tractor-trailer waiting time for supplier trucks was reduced from \$3.14 to \$2.17 per receiving, Table #2. This reduction of 97¢ per truck receiving is considered to be significant.

### Conclusions

The appointment system in Firm #3 was effective in reducing the waiting time for drivers and equipment.

There was no significant change in the management or operation of the truck receiving dock after the installation of the appointment system.

As was indicated in the previous report, the availability of additional receiving doors, the central driver check-in, the rapid clearing of the receiving area and the availability and completeness of the purchase orders (including stacking information) would further reduce waiting time.

In firm #3, all backhauls are unitized thereby effecting efficient unloading with a fork lift. However, normal procedure for all supplier trucks, whether palletized, slip sheeted or handstacked, was to hand-stack unload onto small pallets or relayer.

This created dock tie up that could not be corrected by an appointment system as full loads took several hours to unload.

Table #1 Driver and Tractor-Trailer Waiting Time in one Wholesale Warehouse Before and After Installation of an Appointment System (in minutes).

	No Appointment System			Appointment System			
	Arrival to Park/Door	Park-Begin Unload	Total Time	Arrival to Park/Door	Park-Begin Unload	Total Time	Reduction Wait-time
Supplier Trucks*							
Actual	15.12	10.71	25.83	9.03	8.33	17.36	8.47
Adjusted	13.98	6.16	20.14	8.22	5.72	13.94	6.20
Backhaul Trucks**							
Actual	7.15	41.10	48.25	17.55	30.51	48.06	.19

\* 55 receivings in both studies

\*\* 39 receivings in before study and 29 receivings in after study

Table #2 Total Cost of Driver and Tractor-Trailer Waiting Time Before and After Installation of an Appointment System; Supplier Trucks Only

	No Appointment System	Appointment System
Total Waiting Time	20.14 min.	13.94 min.
Labor Cost of Waiting*	\$2.42	\$1.67
Depreciation for Tractor-Trailer**	<u>\$ .72</u>	<u>\$ .50</u>
Total Cost of Waiting	\$3.14	\$2.17

\* Based on \$7.20 per hour

\*\* From Table #2 of previous report; \$2.16 per hour for tractor-trailer.

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