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## Inbound Processing Method of Express Company

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**Abstract:** This study aims to provide a scientific inbound processing method for express companies to standardize their operation thus improve their service quality consistently. The general guidelines in respect to safety, clothing and planning ahead are listed and effective sorting and loading methods are discussed in detail. The inbound processing method provides couriers a good and timely start of shift with the proper workload assign to them which ensures express companies improve reliability, safety and productivity.

**Key words:** Inbound processing method, sorting, loading, express company

### INTRODUCTION

Customer satisfaction is primary for all express companies. Customers not only expect express companies to provide great service, they expect the service quality to be consistent (Zheng and Wang, 2011). This expectation is the same for any service centers around the world. Thus, it is important for express companies to standardize all aspects of operations to yield normalized results (Zhong, 2008).

It is of significant importance that all employees on the inbound processing follow the prescribed and predetermined methods. These methods are standardized and measured to be the most effective way to perform the tasks under normal and safe conditions. Executing the inbound processing tasks using the prescribed methods will yield consistent results that balance the cost with the great service provided to the customers.

But at present, some express companies still operate at low efficiency for lacking of scientific methods (Zhang *et al.*, 2012). Their work environment is not standardized and there is no standardized operation method implemented (Zhou, 2008). This study puts forward an inbound processing method for express companies to standardize their sorting and loading operations and thus improve their service quality at high and consistent level.

### GENERAL REQUIREMENTS

#### Safety:

- Know the work surroundings and be aware of changing conditions

- Determine the location of emergency exits, fire and safety equipment areas, conveyor exits, switches
- Ensure all equipment is in good functioning order before using
- Always stay clear of moving vehicles
- Use all equipment safely in accordance with safety rules
- Follow prescribed methods to perform any task
- Handle heavyweight and odd sized pieces with care, asking for assistance from others when needed
- When possible, face the work; never work against the flow
- Maintain the work within the “power zone” which is the middle range of any motion (Fig. 1). It is the zone

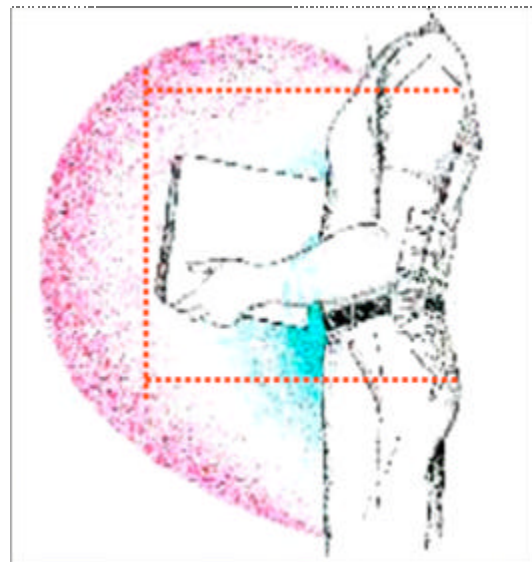


Fig. 1: Power zone

where maximum strength can be attained with the least amount of effort exerted

- Never lift with the back. Bend knees and lift with legs
- Do not twist, always pivot or step
- Never walk, sit or jump over a conveyor or slide
- Never run, walk briskly
- Grasp pieces from opposite ends; never use straps
- Do not throw pieces. Place in the correct area

#### Clothing:

- Wear safety shoes that are in good condition
- Ensure clothing is not hanging or loose where it could get caught by moving equipment
- Use gloves and back belt as permitted
- Use stable ID card holder when working near moving equipment

#### GENERAL GUIDELINES FOR PLANNING AHEAD

Here are some general guidelines for planning ahead.

- Gather supplies needed for the entire sort before starting inbound activities
- Do not double handle pieces, process pieces correctly the first time
- Minimize walks by maximizing carries and combining activities
- Leave an emergency exit path
- Do not leave unprocessed pieces on the floor
- Plan the handling of non-conveyable
- Ask for help when needed to minimize the impact on others/disruption of the Inbound operation
- Handle damaged or open boxes immediately according to guidelines for damaged shipment processing
- Do not place open pieces on a conveyor

The benefits of planning ahead are:

- Work can be performed more predictably and reliably
- Errors are reduced
- Time is used efficiently

#### SORTING

Sorters are responsible for ensuring labels are up or facing the loaders and separating the pieces for each side of the conveyor. They in some cases load as well.

In case of dual sorters additional items, the job is shared and teamwork is required. While one is away from

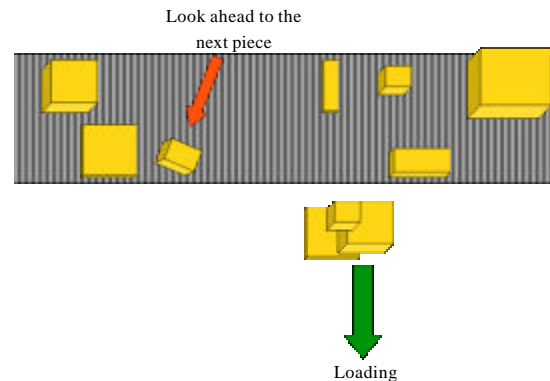


Fig. 2: Working the flow

the conveyor, the other keeps sorting. Sorters should communicate with one another.

Here are more key items to pay attention when an employee is sorting:

- Stay ahead of the work
- When sorting, visually select the next piece to sort (Fig. 2)
- Make effective use of surface area of the conveyor
- Do not let odd or non conveyable pieces travel down the conveyor
- Do not leave pieces, straps or wraps on the floor
- Inspect the work area. Make sure all pieces are processed before leaving the area

#### LOAD PRINCIPLES

##### Set up:

- Ensure all load tools are present and up to date (e.g., courier scanner, bins/totes, load diagrams, marker)
- Ensure the vehicles are parked according to the correct lineup and are flush to the platform (if present) or parked 1 meter away from conveyor to allow load access
- Ensure all vehicle loading doors are open
- Ensure vehicles are free of any packages before starting

##### Work area:

- The loader's work area begins 1 meter ahead of the first vehicle and ends at the last vehicle
- Stay ahead of the work
- Spend most of the time at the start of the work area, returning to this point after each load

**Loading sequence:**

- The loading sequence begins at the start of the work area presorting pieces
- Stack pieces for the same route to optimize the carry on conveyor
- Allow pieces to travel on conveyor if for a vehicle down the line (Wang and Zheng, 2011)
- Select pieces to be loaded
- Load pieces on the vehicle as per the prescribed method and note stop count
- Visually check the belt for incoming pieces
- Return to the start of the work area where possible
- Flyers should be sorted into totes in the flyer sort area and sent to the loaders periodically and not held till the end of the sort
- Flyers then should be sorted from the flyer sort mixed totes by the loader into the designated section/quadrant totes for the route
- Non-conveyables should be processed and held for the couriers to pickup at the NCY area

**Optimum carry:**

- An optimum carry (Fig. 3) is designed to minimize walks from and to the conveyor belt increasing efficiency
- All pieces in an optimal carry must belong to the same vehicle and be moved in such a way that prevents damage or injury

**End of shift:**

- Turn off conveyors as designated by the supervisor
- Store empty equipment neatly in the designated areas
- Do not leave pieces, straps, etc. on the floor
- Inspect the work area. Make sure all pieces are processed
- Move on to next assignment without delay

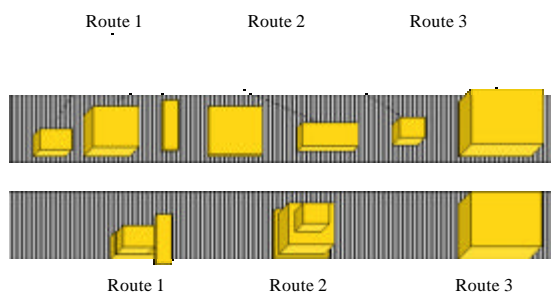


Fig. 3: Optimum carry

**LOADING**

Using platform or at grade with steps:

- Select pieces from conveyor
- Take a note of the address code and note the sequence according to the pull chart then review against load chart
- Scan as 'WC' (With Courier)
- Load piece directly to final load area (shelf if fitted) or place piece on load aid for later loading when flow allows
- Note stop count using the stop count sheet
- All consignee address labels must be loaded face-up
- Do not load any pieces whose final load position is designated as either center or rear of the vehicle
- Flyers in the totes must be sequenced into route order (stop for stop)

**MULTI ROUTE LOAD METHOD**

The Multi Route Load (Fig. 4) method is designed to enable an employee to load pieces to multiple routes simultaneously. The same method is applied when loading multiple pallets, creating multiple stacks or directly loading into multiple vehicles from a conveyor.

Regardless of how many routes are loaded, each load set (the collection of routes loaded by the employee) starts at the point on the conveyor where the employee is presorting pieces to load. The employee must allow all pieces to travel on the conveyor until the specified load point. The loader must aim to always return to the head of the load set whenever possible.

The following are the steps to load three routes (Fig. 5):

- Presort/stack pieces for optimum carry
- Select for first route and note sequence
- Load pieces and mark stop count sheet
- Scan the belt
- Select for second route and note sequence
- Load pieces and mark stop count sheet
- Scan the belt
- Select for third route and note sequence
- Load pieces and mark stop count sheet
- Scan the belt

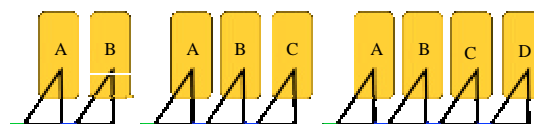


Fig. 4: Multi route load

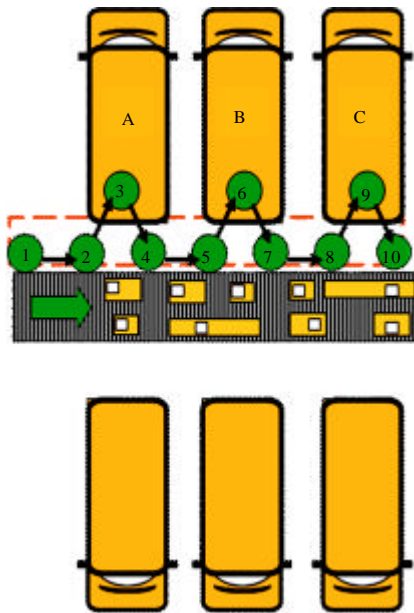


Fig. 5: Three routes load method

Other important elements when performing the Multi Route Load Method include:

- Straighten and match pieces for other areas whenever possible
- Do not store pieces on the floor outside the vehicle as a preliminary step
- Carry pieces directly into the vehicle for loading
- Handle damaged or open pieces immediately according to the local operation conditions; do not place open pieces on conveyors
- Process hazardous materials as dictated by local conditions.

### SECTION LOAD METHOD

Section loading is critical to the success of the courier's on route activities. The measure of success of the inbound process is determined by the effectiveness of the section loading of pieces onto the vehicles. The goal of section loading is to utilize the maximum amount of space on a vehicle while loading pieces in delivery sequence (Huang *et al*, 2011).

Floor load:

- Divide the floor of the vehicle into four or more equal sections (Fig. 6). This gives the driver the ability to quickly locate packages from every stop
- Load all pieces in delivery sequence stacking as necessary

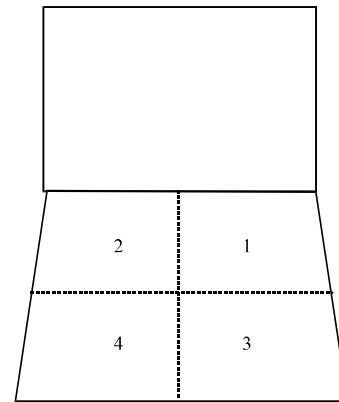


Fig. 6: Floor load

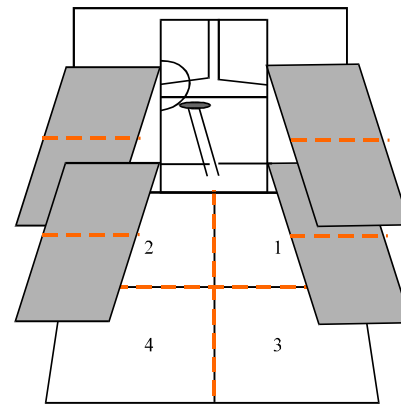


Fig. 7: Shelf load

- The section closest to the driver selection door is designated the first section
- Place the first stop in each section closest to the selection door
- The delivery sequence of the stops should run harmoniously throughout the different sections
- Totes must be loaded separate in each section and placed at the beginning, flyers must be sorted in delivery sequence as well. It is allowed to load two or more flyers sections into one tote

### Shelf load:

- Divide the shelves of the vehicle into four or more equal sections (Fig. 7) (Sun and Zhang, 2012)
- Load all pieces in delivery sequence on the shelves
- Packages can be stacked to utilize all the shelf space provided the delivery order sequence is maintained
- Place pieces on shelves so the labels face toward the selection door, toward the aisle, or up

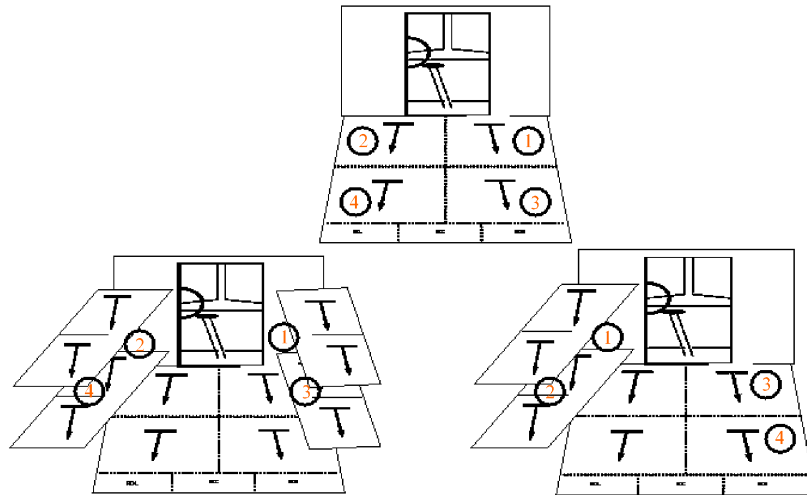


Fig. 8: Load diagrams

- Load so that the front edge of the piece extends beyond the shelf edge
- Load large pieces on the floor to maximize the number of pieces to be loaded on the shelf;
- The top shelf in each section contains the first deliveries in that section
- Place the first stop on each shelf nearest to the front of the vehicle
- Rear door delivery stops are determined on the basis of the number of pieces, the size of the pieces, or a combination of both
- Maintain access to all areas of the vehicle by retaining a walk aisle approximately 0.5 m wide

Load diagrams (Fig. 8) are used to properly balance the workload in a vehicle and assist in positioning of stops on the vehicle.

#### NON-CONVEYABLE LOAD METHOD

##### Non-conveyable load method is:

- Load large or non-conveyable pieces for each section on the floor in delivery order
- Keep the delivery sequence running from the selection door toward the rear
- As with the pieces on the shelves, floor loaded pieces may be moved forward or back in delivery sequence to maintain a balanced distribution

- Maintain access to all areas of the vehicle by retaining a walk aisle approximately 0.5 meter wide;
- Face labels upward or toward the selection door

#### CONCLUSION

The couriers' on time service and commitments are dependent on leaving the service centre at a predetermined schedule with the proper amount of work assigned to them. The inbound processing method allows for an efficient execution of sorting and loading operations that will provide the couriers the opportunity to improve service quality (Zheng and Sun, 2008).

This study points out the importance for express companies to implement scientific methods to standardize their operations and then put forward an inbound processing method. The general requirements in respect of safety and clothing are listed and general guidelines for planning ahead are introduced. Then the study goes in detail to the sorting and loading methods which help express company standardize their operations scientifically and efficiently.

The inbound processing method is the pillar for successful on route activities. An effective inbound processing method will give the couriers the opportunity to serve our customers efficiently with high productivity and quality at the forefront.

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**REFERENCES**

- Huang, Y.D., W.S. Qiao, Z. Xu and J. Zhang, 2011. Modeling and optimization of vehicle goods loading. *Hoisting Conveying Mach.*, 6: 76-79.
- Sun, Y. and J.J. Zhang, 2012. A method to solve cargo loading problem and VRP. *Logistics Manage.*, 2: 83-87.
- Wang, W.M. and W. Zheng, 2011. Simulation and optimization of operating tactics in fruit and vegetable distribution center. *J. Wuhan Univ. Technol. (Inform. Manage. Eng.)*, 33: 821-824.
- Zhang, F., T. Chun and F. Xiao, 2012. Study on optimization and simulation of expedited cargo picking center based on Flexsim. *Logistics Technol.*, 31: 419-421.
- Zheng, K. and X.C. Wang, 2011. Location selection of the fruit and vegetable distribution center based on the maximization of service. *J. Anhui Agric. Sci.*, 39: 8760-8763.
- Zheng, W.L. and H. Sun, 2008. The strategy study for sorting operating system of distribution center. *J. Guangdong Aib Polytechnic Coll.*, 24: 71-73.
- Zhong, Y.P., 2008. How to improve the productivity of distribution center. *Sci. Technol. Inform.*, 33: 277-277.
- Zhou, N.W., 2008. Application of RFID in distribution center processing. *Technol. Wind*, 16: 76-77.