



**HOW BLOCKCHAIN TECHNOLOGY
WILL TRANSFORM THE TRADITIONAL
EQUIPMENT INTERCHANGE RECEIPT
(EIR) PROVIDING IRREFUTABLE
ACCOUNTABILITY AND SAVINGS TO
THE TRANSPORTATION INDUSTRY**



INTRODUCTION

Within the USA, there are approximately 37.5 million containers and trailers that transport goods annually through 4 to 8 interchange points on each trip. At each point of interchange, the liability for the condition of the shipping container and the goods being transported is passed to the next party. It is estimated that 25% of the containers and trailers, or approximately 9.4 million, are damaged in transit on an annual basis.

THE PROBLEM

If one conservatively assumes a damage fee of as little as \$200 per incident, annual repair costs could quickly exceed \$1.8 billion. Additionally, the \$1.8 billion does not account for other expenses associated with the damaged unit. A sample of these costs can include:

- the cost to process each claim;
- the lost days of productivity and revenue while the container awaits approval and repair;
- the overall, immeasurable frustration experienced by all parties involved;
- the cost of damaged goods being shipped;
- the out of pocket expenses for damage repair to the equipment

When totaled, the overall industry expense becomes significantly larger resulting in increasingly costly methods to protect the individual company from liability for damages to containers and trailers.

Identifying the responsible party becomes a time consuming and painstaking procedure that

starts by working backwards through the interchanges. A process of elimination is undertaken searching through the records for the company that does not have irrefutable evidence to clear them of any liability for damage to the equipment while in their possession. The first company failing to provide such evidence becomes the responsible party by default and liable for any associate costs.



HOW IT IS DONE TODAY

Large railroad terminals and ports with high traffic volumes have automated gate processes for the inspection of equipment, like that pictured here by Nascent Technologies. This sophisticated equipment records the condition of the equipment for all in-gate and out-gate interchanges at a given facility. The documentation produced serves as photographic evidence of the interchange.

While being a great solution, this equipment can be price prohibitive, unless it is installed at facilities with high gate traffic to justify the large expenditure.

Railroads and ports embraced the fact that a picture is “worth a thousand words” and the industry quickly accepted these photographic inspections as proof of interchange. If it were not for the prohibitive cost to acquire and install this equipment, every point of interchange, including container depots and truck terminals, would have already deployed this technology. Unfortunately, this economic reality has relegated the remaining interchange points in the shipment cycle to rely on the opinions of inspectors, cumbersome paper forms, coded computer entries, or no interchange documentation more simply known as “interchanging in the dark”. The associate liability of potentially incomplete or inaccurate data can be a costly consequence.

Behind the scenes, there is an infrastructure that deals with repairing damaged shipping containers and trailers. Finding the responsible party typically begins at the end of a shipping cycle when the container or trailer is returned to the container depot or truck terminal, where it is thoroughly inspected and, subsequently, repaired in preparation for the next load.

When a unit enters the gate at a container depot or truck terminal, it is given a comprehensive inspection to determine the overall condition with all visible damage documented by the inspector. This inspection is recorded on an equipment interchange (EIR) form, like that shown below, or on an electronic device, where codes are entered to record damage. If the inspector fails to



document any damage or enters incorrect data, the depot owner will be held liable for all damages not denoted or properly recorded. An example of this would be a cut in the side of a container that was not documented in the inspection process and, as a result, was not repaired by the depot. Only when the container departs the depot and arrives at the next shipper's dock to be loaded, does the fork-lift operator notice the cut.

At this point, everything stops, and a string of phone calls begins that involves anyone from the steamship line, where the booking was made, to the truck dispatcher at the trucking company delivering the container for loading. Needless to say, this does not reflect well on the trucking company delivering the container or the depot from which it originated. In most instances, the container will be returned to the depot from where it originated. Again, the depot will be liable for rendering all necessary repairs, at their cost, because of the oversight in the inspection process. The container depot will also likely be liable for any additional costs incurred by the trucking company.

Trailers are subject to the same issues as containers. When a trailer is found not load worthy at the customer's dock, often expensive roadside repair firms are utilized to fix the problem, or the trailer might have to be taken to the nearest repair facility, which could be a considerable distance from the customers dock.

How often does this occur? The answer is more often than people would like to admit.

CONTAINER SURVEY FORM- DRY VAN

CONTAINER									
ACCOUNT									
DATE									
TYPE									
SIZE VAN									
DRY VAN									

LEFT									
H	8	7	6	5	4	3	2	1	
T									
B									
G									
FRONT					DOOR				
H	1	2	3	4	5	6	7	8	9
T									
B									
G									
DOOR					FRONT				
TOP									
L	1	2	3	4	5	6	7	8	9
R									
DOOR					FRONT				
BOTTOM									
L	1	2	3	4	5	6	7	8	9
R									
DOOR					FRONT				
UNDERCARRIAGE									
R									
L									
DOOR					FRONT				

DOOR									
H	1	2	3	4					
T									
B									
G									

FRONT									
H	4	3	2	1					
T									
B									
G									

1 Square = 4ft

CONTAINER CODES									
FACE - CODE	SEGMENT - CODE	LOCATION CODE	COMPONENT CODE	DAMAGE CODE	REPAIR CODE	REMARKS			
LEFT - L	UPPER COMPONENT - H								
RIGHT - R	LOWER COMPONENT - G								
TOP - T									

COMPONENT	CODE	DAMAGE CODE	REPAIR CODE	CODE
HAIR	BLA	BENT	BT	STRIP
PANEL	PSA	BROKEN/SPIT	BR	RECOIN
CORNER POST	CPA	BOWED	BP	RECOIN
CORNER FITTING	CFG	CRACKED	CF	RECOIN
CORNER POST / RAIL	CPA	CORRODED/WEAR	CP	REPAIR
VENTILATOR	VVA	CONTAMINATED	VT	REPAINT
HINGE ASSEMBLY	HBA	LOOSE	HB	REPAINT
LOCKING BAR ASSEMBLY	LBA	DEFORMED/DAMAGE	LB	REPAINT
LOCKING HANDLE ASSEMBLY	LHA	DEFORMED	LH	REPAINT
LOCKING BAR/CM	LBC	BENT	LB	REPAINT
CAM KEEPER	CKA	PROGRESSED	CK	REPAINT
DOOR HANDLE RETAINER	DHR	GROGDED	DH	REPAINT
DOOR HANDLE CATCH	DHC	BOILED	DH	REPAINT
GASKET	GDA	DISPLACED	GD	REPAINT
HOOP	HPC	LOOSE COMPONENT	HO	REPAINT
FLOOR	FPA	DISPLACED	FP	REPAINT
FRONT/REAR ASSEMBLY	FRA	GIL/SLASH	FR	REPAINT
TUNNEL ASSEMBLY	TAA	BOWED	TA	REPAINT
TUNNEL RAIL	TAR	PAINT IN FLOOR	TR	REPAINT
GASKET RETAINER	GRT	PAINT FAILURE	GR	REPAINT
OCTAGON	OCA	DISPLACED	OC	REPAINT
LOADING RING	LAR	NOTTED	LR	REPAINT
CONSOLIDATED DATA PLATE	CDP	WEAR & TEAR	CD	REPAINT
FRONT LIGHT SWAY ASSEMBLY	FLA	DIRTY	FL	REPAINT

After a container arrives at the container depot and an inspection has been conducted, the container is entered into the depot's inventory system as either a good order or bad order unit. All bad order units will need to be repaired prior to being released for a booking. Putting the container in a bad order status or red tagging a trailer helps to ensure that it does not get taken out the gate for a booking for its next load until it is repaired.



Units placed in a bad order status must be reviewed by the maintenance and repair team with an estimate being produced. After the estimate is formulated, it is sent to the equipment owner for review and approval. Depending on the total amount of the estimate, the equipment owner may ask for pictures to be taken to show proof that the damage is what was estimated, or the equipment owner may also send out a surveyor to review and survey the damage.

In either case, the depot must now expend additional resources. In the case where photos are requested, the maintenance and repair representative must get up from their desk, walk or drive out to the location where the unit is being stored in the yard, summons a lift machine if the container is stacked in a row, place the unit on the ground, take the photos and, when finished, have the unit returned to the stack.

After returning to the office, the pictures must be downloaded from either a digital camera or smart phone and saved to the hard drive of a PC. Each photo must be renamed with an identifier so that the photo can be found later when requested. Now, and only now, can the photos be attached to an email and sent to the requestor for review. During this process, the meta data that was imbedded in the photo could be lost. It is, indeed a cumbersome and manually intensive with expenses typically absorbed by the depot operator.

How much are they absorbing? If the maintenance and repair person makes \$20.80 per hour with benefits, and it takes between 20 and 30 minutes to retrieve the photos, store them, rename them, file them in a folder and finally send them, the out of pocket cost would be between \$7.00 and \$10.50 per photo sequence.

And consider the cost if, as often occurs in small to mid-size facilities, the maintenance and repair manager making, on average, \$75,000 a year with benefits is performing these duties. Finally, many steamship lines and leasing companies require that photos be taken AFTER the repairs have been completed as proof of work. While this may not sound like a significant amount of money, the cumulative annual cost can be substantial for the container depot or repair facility.

After the container has been estimated, repaired and put back into good order status, a repair invoice is produced and sent to the equipment owner with supporting documentation. The equipment owner must now decide who is responsible to pay for the repairs. The first party identified as guilty is typically the trucking company that delivered the container to the depot. After all, they are the party who signed the inbound interchange documenting the damage, usually without reciprocal proof showing that they accepted this unit with the damage present. Without further question, the equipment owner produces an invoice, and it is forwarded to the trucking company with a copy of the repair invoice and a copy of the EIR.

The liability is solely in the hands of the trucking company until they can prove that they did not damage the container. The trucking company must now expend considerable resources to dive into their dispatch system and paperwork files searching for an equipment interchange receipt (EIR) or other relevant documents to support their case, which verifies that they received the container in interchange with the damage present.

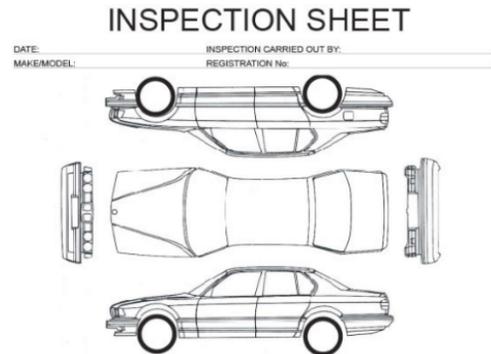
If they find an EIR showing that they received the equipment with the damage noted, they document the invoice as declined and mail the invoice back to the equipment owner from which it originated. If the trucking company can't provide proof, they are forced to accept liability and process the invoice for payment.

Not having proof creates an issue that must be dealt with. Who at the trucking company is responsible for not documenting the damage on an interchange? Who did not properly carry out the functions of their job resulting in the invoice having to be paid?



There are several reasons why companies are held liable to pay for these damages. Some of the reasons include:

- forms that are not descriptive enough to note the damage, resulting in different interpretations of what was noted (like the rental car form pictured here);
- lost or misfiled paperwork;
- repair codes that only the party coding the damage on an interchange understands;
- language barriers;
- not knowing or understanding components to properly report damage;
- not taking the time to document the interchange;
- human error;
- improperly trained inspectors;
- simply missing the damage;



At this point, the only party that can be held responsible is the party that legally accepting the unit in interchange at the physical point of interchange. This is the driver or owner operator who is driving the truck. Part of the Driver's job duties and responsibility is to cover the company by doing a great job at documenting the condition of the equipment at time of interchange. Drivers are entrusted with an enormous amount of responsibility despite not always knowing just how much.

We have all seen the headlines. Hiring and retaining drivers is a huge problem. Billing back or disciplining company drivers or owner operators leaves company officials asking themselves if it is less costly to just pay the invoice and absorb the damage and avoid confrontation with otherwise competent and responsible drivers. In a study performed by the Upper Great Plains Transportation Institute at North Dakota State University, driver turnover costs are shown below:

Overall Results Summary

There were 15 carriers in this study. These carriers ranged in size from 32 to 9,463 trucks. The average cost of turnover per driver for these carriers was \$8,234; with a range from \$2,243 to \$20,729.

Company Driver Results Summary

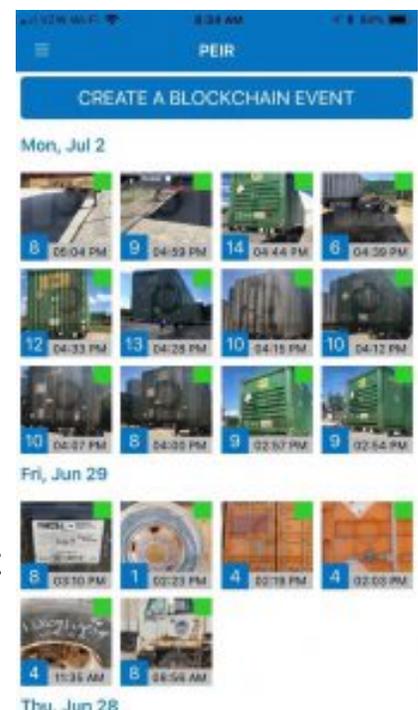
There were 12 carriers with company driver fleets in this study. These carriers ranged in size from 32 to 9,463 trucks. The average cost of turnover for these carriers was \$7,923; with a range from \$2,243 to \$20,729 per driver.

What happens when the driver damaged the container or trailer or it was damaged by another party while it was under interchange to the trucking company? Management at the trucking company is faced with either pushing the issue, or absorbing the cost of the repair. The cost to push the issue leaves a good chance that they might lose the driver. This would add an additional expense of approximately \$8,000, lost revenue, and another position to fill. With the driver shortage, one can well surmise what the decision is.

AN IRREFUTABLE SOLUTION

Irrefutably timestamped photo documentation could be just the answer as a learning and teaching opportunity, as well as protection for your drivers against unwarranted claims of damage liability. Assume you are the driver or owner operator and you know that, for your protection, you are being monitored with photographic evidence. Will you take the extra steps to help protect your company? The answer should be clear. If you know you are being watched, generally you will be more cautious, and you will take steps to protect yourself from the embarrassment of being presented with two photos side by side telling you that you failed. Will you take the additional time to make sure you have clearance when backing into a dock? Will you insure that brake systems are adequately charged and all wheels turning to avoid costly tire damage? And will you verify that you have good photo evidence at every point where a unit is interchanged?

If each driver or owner operator was required to take photos of the condition of the equipment at receipt and at delivery interchange points, there would be no questions and no arguments as to who, what, where, and when. Management would pull up the pictures taken at the time of receipt and at the time of delivery and quickly compare them. If the equipment was received in damaged condition and the driver had failed to note it on a form or via some other reporting method, it might not be the end of the world; the pictures will provide the proof and PEIR will prove when those pictures were taken. PEIR provides irrefutable visual proof that the damage existed at the time the equipment was accepted in interchange. The pictures and blockchain-proved timestamp can be provided as evidence to deny the invoice.



CONCLUSION

Having owned a medium-size trucking company, Tom Burke the founder of PEIR, felt the monetary pain of being held responsible to pay for damaged equipment when his company could not prove they didn't damage the equipment while it was in their possession and under their interchange. Year after year the expenses increased, driven by growth in the number of units being handled and the ever-escalating cost of repairs, a number that directly reduced the bottom line profit. Tom knew that there had to be an answer to this problem of trucking concerns' growing liability issues and began working on a solution shortly after selling the trucking company.

With the advent of Bitcoin and Blockchain Technology, all of the components came together to build a mobile app called PEIR, or Photo Equipment Interchange Receipt. PEIR utilizes any smartphone that irrefutably documents the interchange of containers or trailers. Each event has the date, time, GPS location (within feet) and a series of up to 20 photos that utilizes Blockchain Technology to make the events irrefutable and immutable. Event information is automatically stored directly and securely in the cloud without user intervention.

With PEIR, every Event is documented with undeniable photographic evidence. PEIR utilizes OCR (optical character recognition) technology to mine the photos for relevant numbers. Tags are automatically created as tags that are searchable from the process. PEIR combines this with date, time and GPS location from the phone's metadata, storing the Event in a web based app for easy access by anyone with authorized access. No more guessing or arguing about who, what, when and where. With PEIR you have the most inexpensive insurance available right in your smartphone, priced at less than a cup of coffee.

Don't let any part of that \$1.8 billion-dollars come directly off your bottom line. Let photographic evidence assist in the integrity of the interchange process to protect you from unwarranted repair bills, as well as avoid the potential issues of driver retention in a highly competitive market.

Visit www.peirmobile.com for more information or call **702-829-8400**.

