PennDOT District 11

Electronic Ticketing Pilots for HMA/WMA and Milling Operations January 17, 2018



James A. Foringer, P.E. Assistant District Executive Construction Division



► Why Electronic Tickets?

- Eliminate paper tickets
- No more lost tickets
- Provide materials and tonnage verification



- No time-consuming ticket sorting
- Quickly summarize tickets for contractor payments
- Reduce worksite hazards for
 Inspectors frequently dodging trucks
- Ticket information is now "data" for potential future use and analysis





Information can be used for analysis and forensics of vehicle's location at varies times throughout its trip

For instance:

- Designed to reduce costs associated with over-trucking or under-trucking
- Eliminate bottle-necks at paver and/or Plant
- Hold drivers accountable for performance and production
- Optimize cycle times move more tonnage
- Virtual shift tickets to automate payroll processes
- Scales integration to help with job costing / future bidding
- Alerts / Notifications to management when benchmarks fall outside of norm
- Track paver speed for production



Electronic Ticketing Pilots

- In 2017, District 11 Piloted e-Ticketing on 4 Group Roadway projects in Allegheny County.
- The Districts Special Provision took the e-Ticketing one step farther to also include GPS tracking of equipment.
- This resulted in the Special Provision titling of: Electronic Delivery Management System For HMA/WMA Material.
- Another Special Provision was also added for tracking the delivery of milled materials to a specified plant or stockpile site.



- GPS tracking of all equipment associated with paving and milling operations
- Full GPS integration with plant scale system
- Ability to measure and track material from plant to final placement destination
- Provide the data real-time with a web-based system compatible with iOS and windows environments



> 2017 District 11 Pilot Projects

Project	Contractor	eTicket Management System		
Allegheny Group 1	A. Folino Construction Inc.	Lindy Paving Inc.	Earthwave Technologies: Fleet Watcher	
Allegheny Group 2	A. Liberoni, Inc	Lane Construction Corp.	Zonar GPS System / Libra Systems e-Ticketing	
Allegheny Group 3	A. Folino Construction Inc.	Lindy Paving Inc.	Earthwave Technologies: Fleet Watcher	
Allegheny Group 4	Tresco Paving Corp.	Tresco Asphalt Supply Co.	Earthwave Technologies: Fleet Watcher*	

Manual eTicketing for an offline plant.



FleetWatcher Features

- GPS and Ticketing all in one system.
- System is fully integrated with the Asphalt Plant
- Ticket data is available in a CSV file format





Fleet Watcher Real-Time Mapping





Fleet Watcher Geo-zones

Source Geo-zone Lindy's 2nd Avenue Plant

Destination Geo-zone Mosside Blvd Limits of Work





Fleet Watcher Load Cycle Analysis Report (LCA)





Fleet Watcher LCA Shift Information

Shift Name	Electric ave
Source Geozone	Lindy - 2nd Ave
Destination Geozone	53101
Report Start Date	Oct. 7, 2017, 6 a.m.
Report End Date	Oct. 7, 2017, 5:59 p.m.
Load Count	69
Net Tons	1,470.92
Tabular Report	

Shift Notes



Fleet Watcher LCA Line Graph Report





Fleet Watcher IOS Mobile Application Features

ri Verizon LTE	1:38 PM	0.63% 🔳)
·•	21.02	
Scale Ti	ckets	5
Project#	Search	Project Name
Ticket#:		240601
Date/Time:	Dec 0	1 2017 01:29 PM
Asset Name:		504049
Scale Asset Name:		504049
FW Known:		Yes
Source:	(Cosmonaut Plant
Weighmaster:		
Project Name:	1	/era Apartments
Phase Code:		
Material Name:		SP 9.5 C
Void:		0
Net Tons:		21.66
Gross Tons:		34.51
Free Form 1:		
Temperature:		
Waste Tons:		0.0
Project Number:		Vera
Cumulative Tons:		169.9

ell Verizon LJE	2:00 PM	Ø 60% 🛤
		Done
240604		
TICKET INFO		
Date/Time:	Dec 01 20	17 01:53 PM
o de la compañía de l	0000120	17 01.00 P M
Scale Asset Na	me:	
Asset Name:		
FW Known:		No
Source:	Cosn	nonaut Plant
Weighmaster:		
Project Numbe	r:	St.Cloud
Project Name:		
Phase Code:		
Material Name:		SP 9.5 C

Verizon LTE	2:01 PM	0 60% 🗰 🔿
	240604	Done
Cumulative T	ons:	2.75
Void:		0
Net Tons:		2.75
Waste Tons:		0.0
Free Form 1:		
Temperature		
WASTE INFO		
Upd	date Waste: 0	0.0
TEMPERATURE I	NFO	
Ad	d Temperatur	e
NOTES		



Fleet Watcher IOS Mobile Application Features





Fleet Watcher Feedback

- Benefits
 - -Easy to set-up
 - Data can be used as trucking payroll
 - Real-time fleet monitoring/driver behavior
 - Fleet optimization potential
 - Milling operations much safer
- Issues
 - Erroneous truck readings when dual paving
 - Difficult to identify material sample locations
 - Asset numbers difficult to locate on trucks
 - Constant coordination with GPS unit if owner/operator outfit employed
 - Scale integration not possible for "off-line" plants



Fleet Watcher Offline Plant

- The Group 4 Project supplier had a Windows 98 offline computer system to manage the ticketing process.
- This did not allow for the automated ticketing in the Fleet Watcher System.
- To solve this issue, the ticket information was loaded on a flash drive and then downloaded onto an online computer to load into Fleet Watcher.
- This was done at the end of the shift.



Zonar GPS and Libra e-Ticket Features



• Zonar is the GPS tracking system



- Libra is the ticketing system at a Lane Plant
- Ticket data available in a CSV file format



Zonar GPS System



Zonar GPS System



Zonar GPS System

	And the second second second	And and a second second			
ECMS Home Page	O) & Liberoni Inc Daily Log #4733	reports %2Fachedule Additional security verification CTC - Zonar	-		P+ 0 the
GROUND TR	AFFIC CONTROL	A Reports Driver	s Assets Manage		ALI5727
Schedule				0 8 4	Filters
View Schedule B Report Type 2 View schedule b when all assets through the sele Search all assets zones/zone cate Attribute Filters: Select Attributes:	Dy: Asset Zotte 2 Asset No: 2 All Assets passed etend zone(s). s and up to 5 segories. No Attribute Filters Select Attributes	SR0400 Bennett St Travel Hulton Road - SR2082 Hulton RD Hunter Road - Lane Plant P/H SR2080 Hunter Rd SR2080 Hunter Rd SR2080 Hunter SC SR0130	Date Range: From: 2017/11/08 100 00 : 00 V To: 2017/11/08 10 23 V : 59 V	Apply	
GTC - Zonar Sy	rste Quickbase Load F 💽	X 🗄 w 🖥 P 🖸 🧿	0 Inbox - dlassiter@	Lan -	▲ 11:40 AM 12/5/2017
			6	DEPARTMENT OF T	

> Zonar GPS System

MS Home Page	O) A Liberoni Ior Daily Log #4753	Preports N2Fschedule Additional security ventication	C GTC - Zonar Systems 8 ×	- B C Search	The second second	P- 01
GROUND TR	AFFIC CONTROL	ft Repo	rts Drivers Assets	Manage		Torn Ulery ALIS727~
			Report Type 2			
			Zone: Lane Plant			
o Bata	Accel	lei.	Out	Time In Zone	Duration	Records 1-58 of 98
2017-11-08	() 02 LIb46	08:04:29	out	-	00:00:00	0.0 Miles
2017-11-08	0 02 Lib46		08:24:12	00:19:43	00:19:43	0.4 Miles
2017-11-08	0 02 Lib46	09:29:47		-	01:05:35	31,1 Miles
2017-11-08	() 02 Lib46		10:21:36	00:51:49	00:51:49	32.0 Miles
2017-11-08	02 Lib46	11:56:32		-	01:34:56	58.4 Miles
2017-11-08	() 02 Lib46		12:21:01	00:24:29	00:24:29	59.5 Miles
2017-11-08	🕕 02 Lib46	14:02:41			01:41:40	85.3 Miles
2017-11-08	02 Llb46		14:25:56	00:23:15	00:23:15	86.2 Miles
2017-11-08	() 02 Lib46	16:37:19			02:11:23	112.0 Miles
2017-11-08	🕕 02 Lib46		16:50:31	00:13:12	00:13:12	112.9 Miles
2017-11-08	🕕 03 Lib62		10:53:34		00:00:00	0.0 Miles
2017-11-08	() 03 Lib62	13:42:59			02:49:25	26.0 Miles



Libra e-Ticketing System

100		-		A CONTRACTOR OF A CONTRACTOR OF A CONTRACTOR OF A CONTRACTOR AND A CONTRAC		and the local diversion of the local diversio					00
	https://	laneconstruct.sha	epoint.com/sites/plan	nts/hbre/Lists/LibreTicketDeta/B	OateWithTotals_aspa#i	nphveviHash4a747cH4-7070-4c	25-6647-2c8629 - 🛱 🖒 Sea	rch		Q	· 0 tr
A Liberon	i Inc Daily	/ Log #4753 🚺 L	ibra Ticket Data - ByDa	ateW×	- March - State - Stat	Concession in the local diversion of the loca	and the same of the local division of the lo		_		
Office	365								4	2 ? De	on Lassiter
ROWSE	ITEMS	ust								() SHARE ()
w Quic	k Greater View	Create Column	Current View: ByOateWithTotals * + 1 - 30 p	Tags & E-mail a Alert Notes Link Me-	RSS Connect to Dublock	Export to Excel	Customize in InfoPath	List Settings	Shared Workflow With Settings		
rw Format		Manage	/ews	Tags and Notes Share & T	rark.	Connect & Export Sum = 22 792 2	Customice List		Settings		
⇒ Tra	ansaction	Date : 2017.11.3	10 (1)								
₽ Tr	ansaction	Date : 2017.11.2	1 (26)								
~ Tr	ansaction	Date : 2017.11.1	5 (2)								
Þ Tra	ansaction	Date : 2017.11.0	9 (61)								
4 Tra	ansaction	Date : 2017.11.0	8 (47)								
						Sum= 1,030.77					
	LIB46	93078	11/8/2017 10:11 AI	M 9.5mm Warm 64-22 03(S)	WA303S 77019	22.01	22.01	539956	22111	ECMS#105228 SR.0400	W95122H29
	LIB68	93079	11/8/2017 10:12 AI	M 9.5mm Warm 64-22 03(5)	WA303S 77019	21.8	43.81	539956	22111	ECMS#105228 SR.0400	W95122H29
	LIB62	93080	11/8/2017 10:18 AI	M 9.5mm Warm 64-22 03(5)	WA303S 77019	22.1	65.91	539956	22111	ECMS#105228 SR.0400	W95122H29
	97	93081	11/8/2017 10:19 AJ	M 9.5mm Warm 64-22 03(S)	WA303S 77019	21.84	87.75	539956	22111	ECMS#105228 SR.0400	W95122H29
~	LIB48	93083	11/8/2017 10:22 A	M 9.5mm Warm 64-22	WA303S 77019	21.95	109.7	539956	22111	ECMS#105228	W95122H29
	<u> </u>						0-				13-34 044



Libra e-Ticketing System

X			DAGELAVOUT		DEVIEW VIEW	E-tick 1	1-08-2017 - Excel			~ (7)	? III	X
	a. X	Cut	PAGE LATOUT		wiew view	QUICKBOOKS	. Ico			Σ AutoSur	- A.	44	10 M
		Copy +			e wrap rea	Gen	erai -	. ⊡ ⊉ 6	🏂 💌 🔍	🗄 🖬 🖬 Fill -	Ζĭ		
Pa	aste 💉	Format Painter	I U - 🗄 -	<u>°</u> - <u>A</u> -≡==€	: 🖅 🔡 Merge & Co	enter - \$	- % * *****	Conditional For Formatting * Ta	mat as Cell Insert Deleti able = Styles = = = =	🖌 🖉 Clear	Sort a Filter	8 Find 8t * Select *	
	Clip	pboard 5	Font	5	Alignment	r5	Number	s Style	es Cells		Editing		~
F _1			1 F										
K	1		Jx										¥
	P	A B	С	D	E	F	G	н	I	J	К	L	M
1	Truck	ID 💌 Ticket Nu 💌	Date & Time 🚽	Description	🔹 Mix Design 💌	Net Weig 💌	Daily Tota 💌	Scale Locatio	Project Location	🛪 JMF Number 💌	Ī		
2	LIB46	93078	11/8/2017 10:11	9.5mm Warm 64-22 03(5	WA303S 77019	22.01	22.01	22111	ECMS#105228 SR.0400	W95122H29			
3	LIB68	93079	11/8/2017 10:12	9.5mm Warm 64-22 03(5	WA303S 77019	21.8	43.81	22111	ECMS#105228 SR.0400	W95122H29			
4	LIB62	93080	11/8/2017 10:18	9.5mm Warm 64-22 03(5	WA303S 77019	22.1	65.91	22111	ECMS#105228 SR.0400	W95122H29			
5	97	93081	11/8/2017 10:19	9.5mm Warm 64-22 03(9	WA303S 77019	21.84	87.75	22111	ECMS#105228 SR.0400	W95122H29			
6	LIB48	93083	11/8/2017 10:22	9.5mm Warm 64-22 03(8	WA303S 77019	21.95	109.7	22111	ECMS#105228 SR.0400	W95122H29			
1	LIBSO	93085	11/8/2017 10:25	9.5mm Warm 64-22 03(5) WA303S 77019	22.45	132.15	22111	ECMS#105228 SR.0400	W95122H29			
8	LIB63	93087	11/8/2017 10:28	9.5mm Warm 64-22 03(5) WA303S 77019	22.36	154.51	22111	ECMS#105228 SR.0400	W95122H29			
9	055	93068	11/8/2017 10:30	9.5mm Warm 64-22 03(5) WA3035 77019	20.59	175.1	22111	ECM5#105228 SR.0400	W95122H29			
10	046	93089	11/8/2017 10:32	9.5mm Warm 64-22 03(5	WA3035 77019	21.99	197.09	22111	ECMS#105228 SR.0400	W95122H29			
11	UB54	93090	11/8/2017 10:34	9.5mm Warm 64-22 0-3(5	WA3035 77019	22.07	219.16	22111	ECMS#105228 SR.0400	W95122H29			
12	052	93091	11/8/2017 10:35	9.5mm Warm 64-22 03(5	WA303S 77019	22	241.10	22111	ECMS#105228 SR.0400	W95122H29			
14	042	93075	11/0/2017 10:39	9.5mm Warm 64-22 0-3(3	AVA3035 77015	22.13	203.29	22111	ECIVI3#105228 SR.0400	W95122H25			
15	LIB46	93120	11/8/2017 12:13	9.5mm Warm 64-22.0-3(5	WA3035 77019	21.86	307.2	22111	ECMS#105228 SR.0400	W95122H29			
16	LIB68	93121	11/8/2017 12:15	9.5mm Warm 64-22 0-3(5	WA3035 77019	21.00	329.14	22111	ECMS#105228 SR.0400	W95122H29			
17	LIB62	93122	11/8/2017 12:18	9.5mm Warm 64-22 0-3(5	WA3035 77019	21.85	350.99	22111	ECMS#105228_SR.0400	W95122H29			
18	97	93123	11/8/2017 12:20	9.5mm Warm 64-22 03(5	WA303S 77019	22.24	373.23	22111	ECMS#105228 SR.0400	W95122H29			
19	LIBSO	93128	11/8/2017 12:45	9.5mm Warm 64-22 03(5	WA303S 77019	22.01	395.24	22111	ECMS#105228 SR.0400	W95122H29			
20	LIB48	93129	11/8/2017 12:48	9.5mm Warm 64-22 03(5	WA3035 77019	21.84	417.08	22111	ECMS#105228 SR.0400	W95122H29			
21	002	93134	11/8/2017 13:07	9.5mm Warm 64-22 03(5	WA303S 77019	22	439.08	22111	ECMS#105228 SR.0400	W95122H29			
22	LIB63	93135	11/8/2017 13:10	9.5mm Warm 64-22 03(5	WA303S 77019	22.03	461.11	22111	ECMS#105228 SR.0400	W95122H29			
23	055	93137	11/8/2017 13:12	9.5mm Warm 64-22 03(5	WA303S 77019	20.57	481.68	22111	ECMS#105228 SR.0400	W95122H29			
	F	query	(+)					: •			_		
RE	ADY									## @ #	n -	1	+ 100%
-					-	-							1210.014
	6	C Libra Ticket Data	I Quickl	base Load F 🜔	X H E-lick 11-08-2017	W	P 3 🤇	🥖 🤷 Inbox	x - dlassiter@ 🛛 🎦 Prese	ntation1 - M		• 📁 🔶	12/5/2017



Zonar GPS and Libra e-Ticket Feedback

- Benefits
 - -Web based access to both systems.
 - -Tickets are never lost, ticket is always accessible
 - –Much safer during Paving and Milling operations
 - Ability to know when trucks are loaded and current location
- Issues
 - Difficult switching back and forth between the two separate systems
 - -Broker Trucks difficult to manage GPS units



> 2018 Pilot Projects

- District 11 will again be piloting the E-ticketing Special provision in 2018 on three Group Paving Projects.
- These will include a few modifications to the special provisions. These resulted from feedback from the 2017 pilots.
 - Better vehicle identification
 - Consider appropriate asset management when dual mill or paving operations take place to insure vehicles appropriately register in the appropriate zone.
 - Each delivery ticket must allow an available space for inspectors to add information pertaining to material waste, temperature, stations, yield results and other comments. The entered information must also identify the users name.
 - At completion of the project, provide all ticket information in an acceptable electronic data file to the Department.

