September 2020

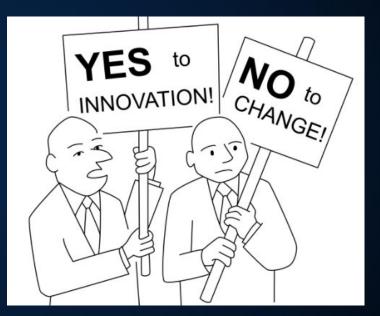




Outline

- What is e-Ticketing?
 - Typical ticketing practice
 - Attributes
 - Advantages
 - Examples
 - Related laws and policies
- Deployment activities
 - EDC-3 and EDC-4 accomplishments
 - Current DOT deployment status
 - EDC-6 goals and challenges









What is the typical material ticketing practice? A "Day in the Life" of a Ticket – Paper Ticket Handlers –

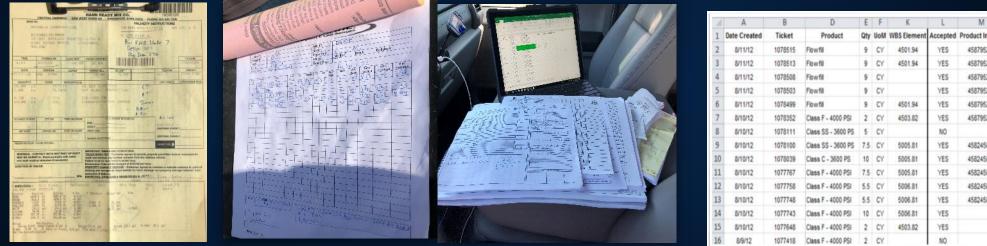






What is the typical material ticketing practice? A "Day in the Life" of a Ticket

– Paper Ticket Processing –





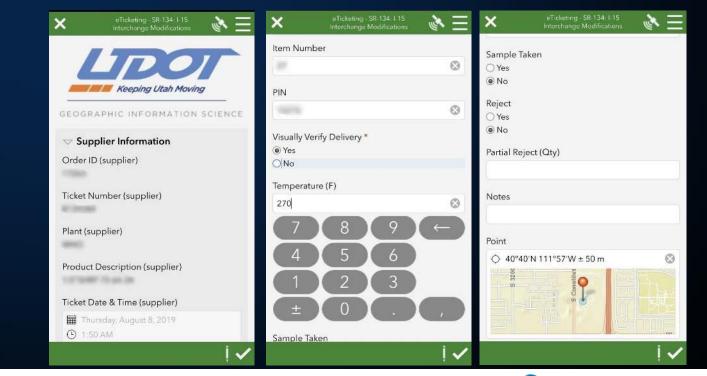




A paperless process for tracking, documenting, and archiving materials tickets, accessible in real-time via mobile devices.

← Scale T	ickets	
Search Ticke	ts by Number	FILTER
# 363698 Jan 21 2020 07.49/02 AM Gross UST: 34.71 Net UST: 20.51	Truck: ET101 Shave Maine Plant 12.5c Phase Code. –	Waste Tons: 0.0 Material Temp: Cumulative Tons: 85.31 Cumulative Loads: 4 # Notes: 0
# 363697 Jan 21 2020 07.46.21 AM Gross UST: 34.63 Net UST: 20.79*	Truck: ET31 Shave Maine Plant 12.5c Phase Code: -	Waste Tons: 0.0 Material Temp: Cumulative Tons: 64.71 Cumulative Loads: 3 # Notes: 0
# 363695 Jan 21 2020 07:24:11 AM Gross UST: 34:97 Net UST: 22:15'	Truck: 504061 Shave Marke Plant 12.5c Phase Code: -	Waste Tons: 0.0 Material Temp: Cumulative Tons: 43.92 Cumulative Loads: 2 # Notes: 0
# 363694	Truck: 504063	Waste Tons: 0.0 Material Temp:







Source: University of Kentucky, Iowa DOT, UDOT





Real-time information

Potential to automate processes (shifts, payments, estimates, DBE tracking, etc.)

Quick and easy set-up

Web-based and interfaces to 3rd parties

Mobile apps, Excel, and emailed PDFs

Works with company or brokered trucks

Captures test data, notes, and photos

Source: University of Kentucky, KYTC, Command Alkon





Q: e-Ticketing - - >> WHY?

#1: Improve worker safety

#2: Simplify ticket **handling** using electronic and digital exchanges

#3: Facilitate **integration** of data into AASHTOWare (or other Construction Management System)

#4: Manage test results with **mobile** devices



#5: **Access** data before (and after) trucks arrive at jobsite



Source: FHWA



What is e-Ticketing? – Real-time information via web or app

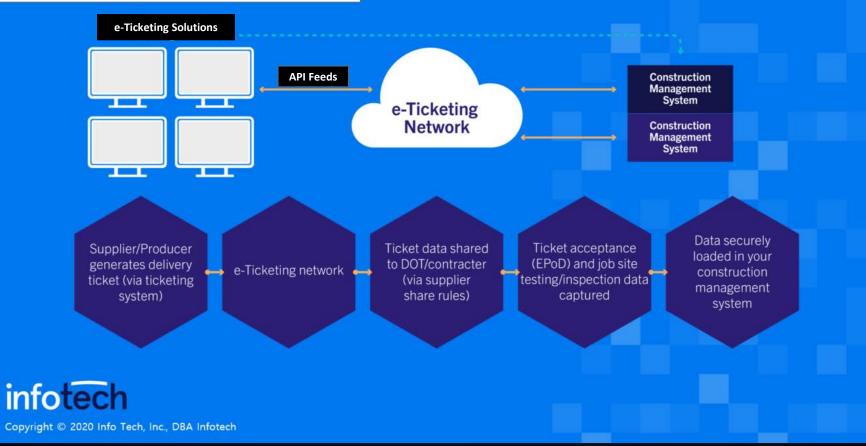
Load Cycle Analy Grand Totals This report	ysis Export to PDF expects the column LoadTim	ne in the de	a, but it was not present								
1539											
Cycle Start Time	Load Time	Tons	Source Geo-zone	Dest Geo-zone	Tim	e in Source	Time to	Dest	Time in Dest	Time to Next Sume	Total Tim
2015-11-20 06:01:06	2015-11-20 06:48:17	23.61	Bourbonnais Plant	BASF Kankakee	<u>52</u>		1 25		<u>40</u> 🚕 🚙	29	146
2015-11-20 08:28:05	2015-11-20 08:31:41	23.62	Bourbonnais Plant	BASF Kankakee	15	1. L	<u>23</u>		44 🚥	-	82
-	-	-	-	BASF Kankakee	-		-		<u>51</u> apa	<u>25</u>	<u>76</u>
2015-11-20 11:09:07	2015-11-20 11:11:15	23.74	Bourbonnais Plant	BASF Kankakee	<u>6</u>		1 23		52 🛛 🔤 🛲 🕰	<u>25</u>	<u>106</u>
2015-11-20 12:55:07	2015-11-20 12:58:08	23.56	Bourbonnais Plant	BASF Kankakee	10	尘	<u>28</u>		52 😡	<u>31</u>	<u>121</u>
2015-11-20 14:56:07	2015-11-20 14:59:18	23.87	Bourbonnais Plant	BASF Kankakee	<u>9</u>	₽	<u>22</u>		20 🚥 🕬 🚥	<u>32</u>	<u>83</u>
2015-11-20 16:19:07	2015-11-20 16:22:01	23.8	Bourbonnais Plant	BASF Kankakee	<u>8</u>	1. D	n <u>23</u>	1	4 🚥	-	<u>35</u>
-	-	-	-	BASF Kankakee	-		-		17 🔊	<u>37</u>	<u>54</u>
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Cycle Start Time	Load Time	Tons	Source Geo-zone	Dest Geo-zone	Time in	Source	Time to Des	t	Time in Dest	Time to Next Source	Total Tir
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2015-11-20 08:55:02	2015-11-20 08:58:30	23.61	Bourbonnais Plant	BASF Kankakee	<u>7</u>	№1	2 <u>0</u>	<u>28</u>		-	<u>55</u>
-	-	-	-	BASF Kankakee	-			<u>54</u>	\$		<u>76</u>
2015-11-20 11:10:02	2015-11-20 11:14:36	23.55	Bourbonnais Plant	BASF Kankakee	<u>8</u>		<u>21</u>	<u>79</u>		<u>24</u>	<u>132</u>
2015-11-20 13:22:02	2015-11-20 13:25:11	23.69	Bourbonnais Plant	BASF Kankakee	<u>5</u>	1	22	<u>39</u>		⊾ <u>30</u>	<u>96</u>
2015-11-20 14:58:02	2015-11-20 15:02:22	23.65	Bourbonnais Plant	BASF Kankakee	<u>8</u>	1-l	23	<u>3</u>	-	-	34
-	-	-	-	BASF Kankakee	-	-		<u>15</u>	*	<u>31</u>	46
2015-11-20 16:22:02	2015-11-20 16:26:25	23.88	Bourbonnais Plant	BASE Kankakee	7	長 た :	23	2		-	32





What is e-Ticketing? <u>– Data management, transfer and usage</u>

e-Ticketing Network Pilot





Source: Info Tech



Types of e-Tickets:

- The Big 3 ullet
 - Hot Mix Asphalt (HMA)
 - Portland Cement Concrete (PCC) ullet
 - Aggregate ullet
- Other igodol
 - **Structural Steel** ullet
 - Rebar \bullet
 - Precast PCC: pipe, inlets, box culverts ullet
 - Guardrail \bullet
 - Signs \bullet
 - Millings ullet
 - Soil \bullet
 - Liquid asphalt/emulsions ullet



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Source: Iowa DOT, University of Kentucky

2 U.S. Department of Transportation Federal Highway Administration

TIDOT DATE Sep 15, 2017

TO JOS:

TAX TOTAL

PROJECT NAME Des Moines-BO 10 Pars Ave

S or WR I or Re

What is e-Ticketing? – GPS units

Breadcrumb Tracking

- Optional, not required
- Hard-wired, mobile app on smartphones, or cigarette lighter adapter
- Internal battery backup
- Ping every minute on haul vehicles
- Ping every 30 seconds on pavers/mills
- No user fees or special software required
- User-based access to data based on privacy laws and contracts







e-Ticketing Related Laws and Policies

• e-Transaction Laws

- Government Paperwork Elimination Act (GPEA) 1998
- Electronic Signatures in Global and National Commerce Act (E-SIGN) 2000
- Uniform Electronic Transactions Act (UETA) 1999
- 2 CFR 200.335 Methods for Collection, Transmission and Storage of Information
- 23 CFR 635.123 Determination and Documentation of Pay Quantities
- 23 CFR 637 Construction Inspection and Approval
- 2 FHWA Memos
 - Computerization of Construction Records, 09/21/1989
 - Electronic Security, 07/07/1993





Source: FHWA



e-Construction's e-Ticketing Deployment

What have we accomplished under EDC-3 and EDC-4?

- Proof of concept
 - State DOT pilots
 - Research projects
- Industry awareness and innovation
 - Commercial off-the-shelf (COTS) solutions
 - Batch plant automation systems
 - Supplier systems
 - Private contractor systems
 - State DOT systems
 - 3rd party providers
 - Private industry usage





Source: iStrada



e-Construction's e-Ticketing Deployment

- FHWA e-Ticketing Goals
 - Improve safety and efficiency through technology
 - Allow inspectors to focus on most-demanding tasks
 - Improve data collection, sharing, and usage
- Win-Win
 - DOT: web-based exchange of material information
 - Contractor: fleet management, delivery tracking, faster payments, safety





e-Construction's e-Ticketing Deployment

- What would we like to see in EDC-6?
 - Expanded institutionalization of e-Ticketing
 - Promotion of best practices of e-Ticket specifications and standardization of ticket content
 - Expanded use beyond 2020 temporary deployments
 - Use of e-Ticket data for source documentation, acceptance, and payment
- Challenges
 - State DOT, Local Agency, Contractor, and Supplier buy-in
 - Privacy
 - 54+ State DOT versions
 - Delivery and data verification
 - Data management and transfer
 - Data usage beyond the construction project
 - 2020 temporary deployments







e-Construction & e-Ticketing

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www.fhwa.dot.gov/construction/econstruction



