

# CEPM

## Webinar #2 – Component Registration requirements for Wheel Shops and OEMs

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CEPM Program Manager

Railinc



ASSOCIATION OF  
AMERICAN RAILROADS



# Introduction to CEPM-Wheelsets and Barcoding Specifications

This session will cover basic information about CEPM-Wheelsets and how you can begin registering components through CEPM-enhanced systems.

Thursday, October 6th, 2011  
2 p.m. to 3:30 p.m. (ET)

Recommended for wheel shops,  
Manufacturers and software  
providers





# Information Online – www.railinc.com/cepm

Railinc Corporation | CEPM Project - Microsoft Internet Explorer provided by Railinc

https://www.railinc.com/cepm



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### CEPM Program Overview

The Comprehensive Equipment Performance Monitoring (CEPM) program is a multi-phase, multi-year initiative to create a rail industry process and related technology tools for capturing data around railcar equipment components. CEPM will help railroads, rail equipment owners, repair and wheel shops, and other industry participants have a complete view of rail equipment health and performance. This will enable managers to make decisions that improve rail safety, lower the cost associated with equipment maintenance, and run more efficient and effective rail operations.

The program's first phase—CEPM-Wheelsets—centralizes the registration of wheelset component details and identifies the application of wheelset components, including AAR and non-AAR repairs. The component-level data created through the CEPM program will be available through Railinc's Umler™

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#### FindUs.Rail

Quickly find critical contacts from across the rail industry.



## About Railinc

Railinc applications and services are critical in operations and financial systems throughout the industry and support railroads, equipment owners and rail industry suppliers.

As subsidiaries of the AAR, Railinc and TTCI support standards and systems to ensure the safe and efficient operation of the North American fleet.





# CEPM Component Tracking Objectives



- Support Recall of Components identified with safety issues
- Support equipment owners with details of components on their equipment
- Capability to track performance of components related to component life, failure rates, and history of the component.

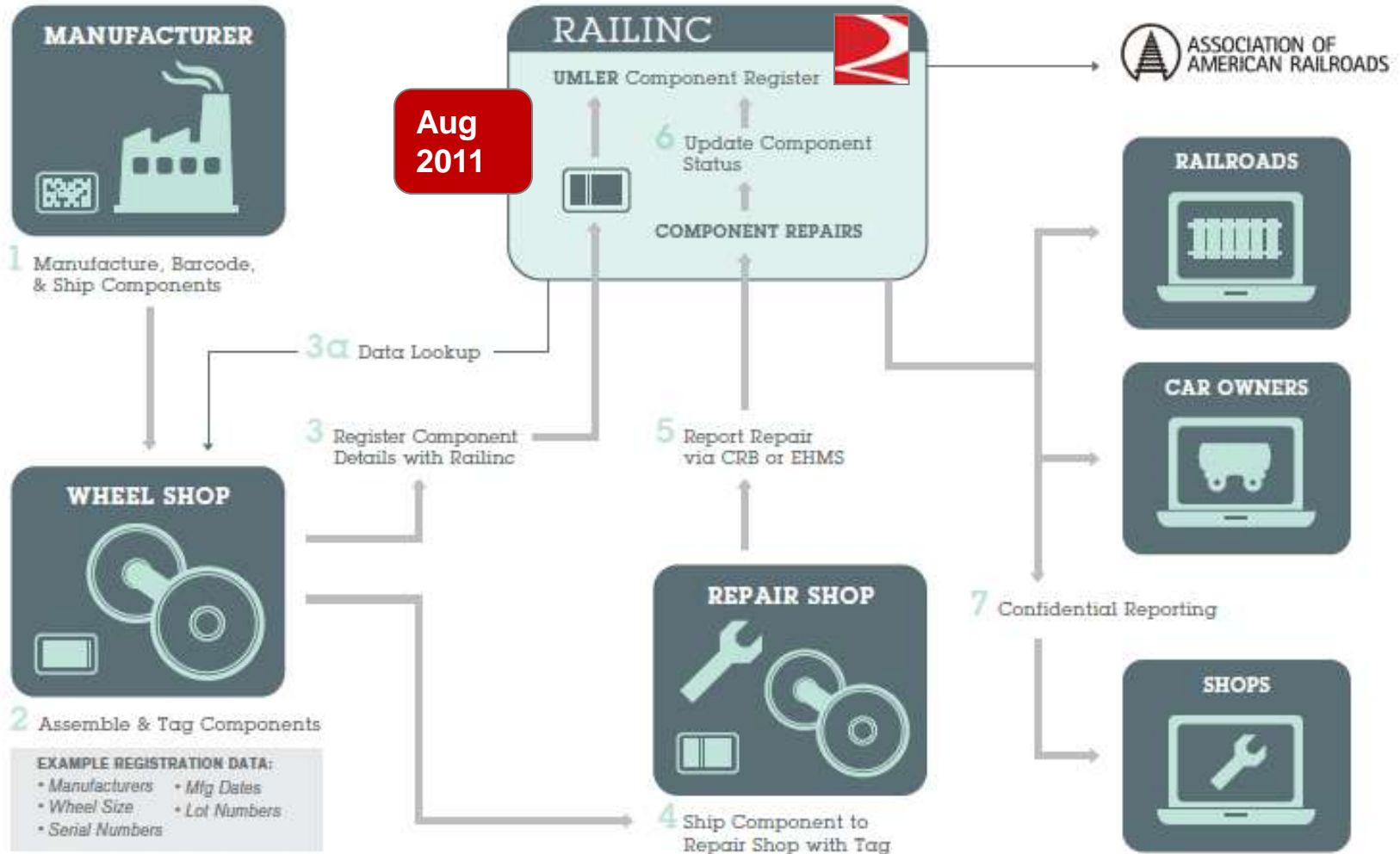


# Industry Requirements

- Establish industry rules for reporting component details and application to equipment
- Develop a re-usable framework that can support a list of priorities for tracking wheelsets, castings, valves, PTC, GPS devices, brakes, cushioning, traction motors, etc.
- Maintain Confidentiality of reported data
- Support Bar Code and RFID standards



# CEPM-Wheelsets Process Flow







# Manufacturers – Keys to Success

Manufacturers of Wheels, Axles, and Bearings will be responsible for accurate barcoding that includes necessary data to support Wheel Shop reporting requirements.

## Key Documents;

- AAR CEPM Bar Coding Specification (Wheelsets)
  - What the OEM 2D bar code should look like
- Wheelset Data Glossary
  - Data Elements that need to be reported
- Reference File
  - Permissible Values





# Bar Codes, RFID primer

BarCode: 1D BarCode

ABCD1234567890 =

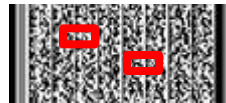


Used for AAR Component Identification, Little Data



BarCode: 2D BarCode or Bar Code Matrix

ABCD1234567890 =



Used for Carrying much data, with redundancy

RFID: Example: AEI



Used for Carrying much data, wireless/remote

Costs, Equipment/Reliability, Longevity – Wheelsets: Survive until application



# Manufacturers – Bar Coding Specification



## AAR Manual of Standards and Recommended Practices

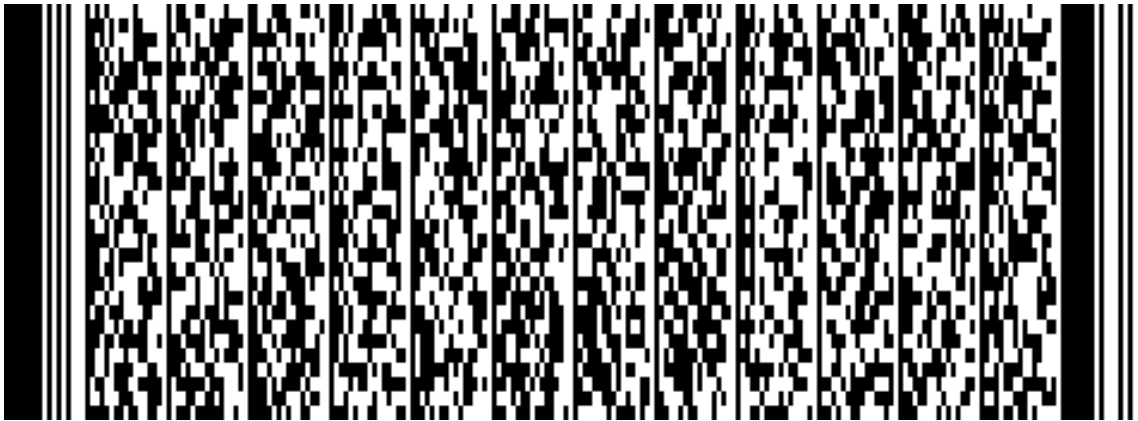
S-XXX

SEGMENT 1.0

- 1 AAR Component Identification (CID) Bar Code Specifications
- 2 Specification M-XXX
- 3 Adopted: XXX 1, 2011
- 4 Purpose and Scope
- 5 The purpose of this specification is to establish an industry standard for the AAR Component Identification Bar Code.
- 6 This standard defines the method and content of bar code labels on components to be tracked within the AAR systems. This will better support the management, administration and maintenance of railroad equipment assets by providing traceability of component performance throughout their life cycle.



# PDF417



1100 byte capacity

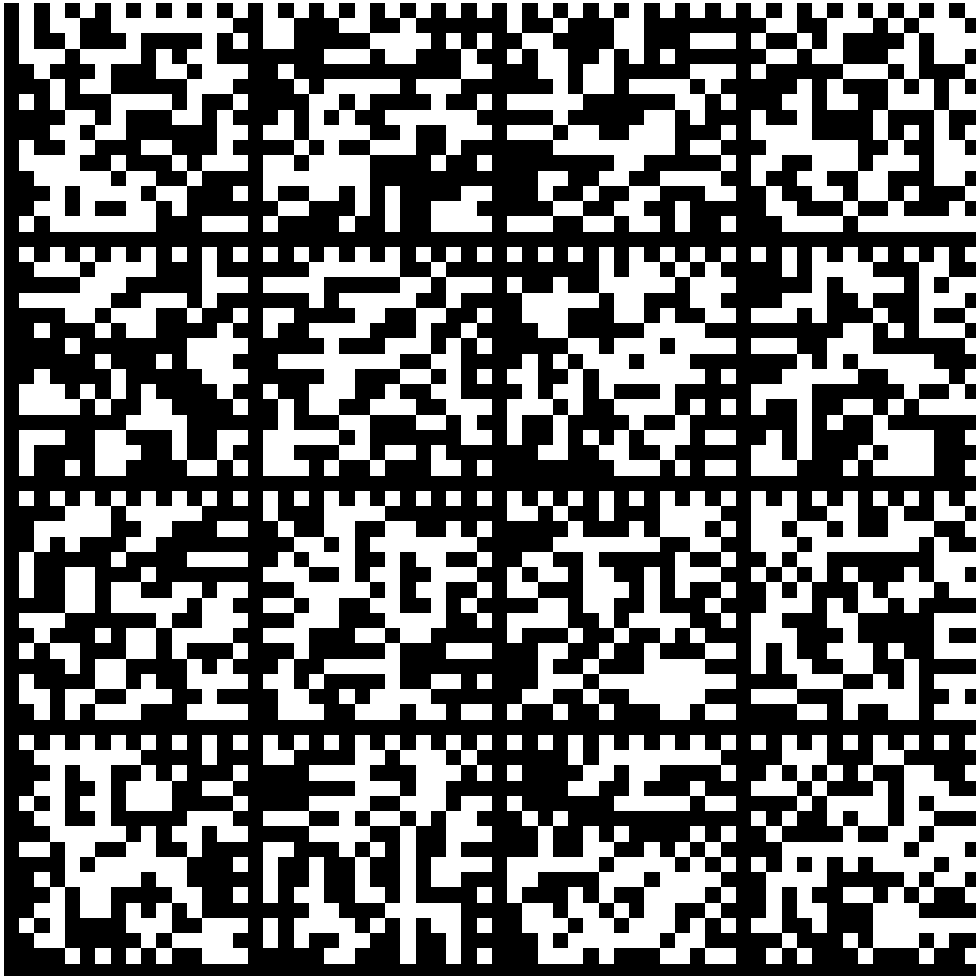
Widely used

- Airlines
- Postal Service
- Inventory Mgmt

“Portable Data File”



# Data Matrix Bar Codes

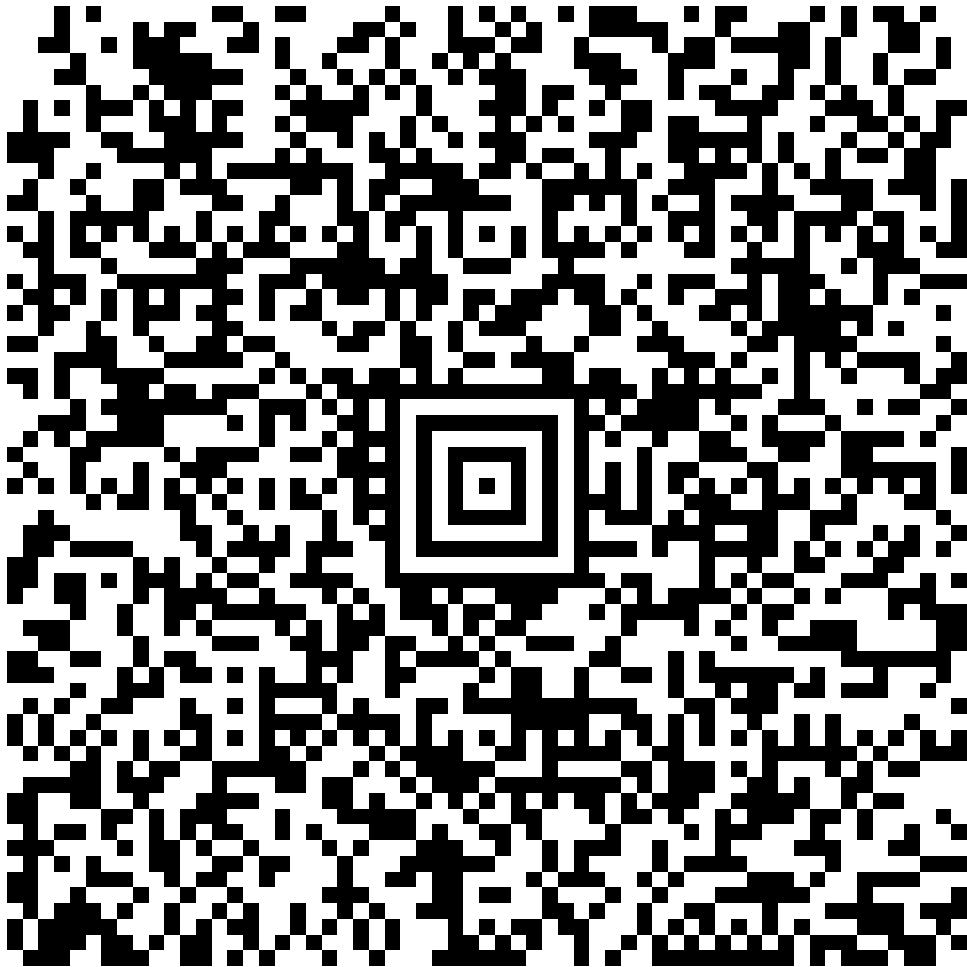


1500 byte capacity  
Widely used in tracking  
of components in the  
aerospace industry

Matrix of light and dark  
Squares



# Aztec Bar Codes



1900 byte capacity

Boarding Passes  
Documents

“Bulls-eye”



# Bar Coding Vendors

ACCU-SORT Systems, Inc.	<a href="http://www.accusort.com">www.accusort.com</a>	
Indigina	<a href="http://www.indigina.com">www.indigina.com</a>	972-725-9309
Barcode ID Systems	<a href="http://www.barcodeid.com">www.barcodeid.com</a>	
Zebra	<a href="http://www.zebra.com">www.zebra.com</a>	
Wheel Shop Automation	<a href="http://www.wheelshopautomation.com">www.wheelshopautomation.com</a>	877-834-9540



# Manufacturers – Bar Coding Specification



```
<Wheel>  
<C101></C101>  
<C102></C102>  
<C103>GRFI</C103 >  
<C104>2/1/2011 18:55:12</C104 >  
<C105>11</C105 >  
<C106>01</C106 >  
<C107>GK</C107 >  
<C108>D</C108 >  
<C109>22</C109 >  
<C110>0</C110 >  
<C111>1231</C111 >  
<C112>1234abcd</C112 >  
<C113>36</C113 >  
<C114>CH</C114 >  
<C115>CrvS</C115 >  
<C116>241.25</C116 >  
<C117>N</C117 >  
<C118>AMST1234</C118>  
</Wheel>
```



**WHEEL NEW**  
**GK 123456 11 / 01**  
**CH 36 D 241.25**

Rim / Finger : 22 / 0  
Plate: CrvS  
Facility: GRFI  
Heat: 1234ABCD  
Date: 2/1/11 18:55:12

**Railroad Wheel Corp**





# Decoding the Data in the Bar Code

The Data Glossary describes the data, who is required to report the information, and which barcode the data should be reported on.

CSV Heading	Element ID		What is this?	Sample(s)	On What?	Field by Wheel shop	Wheel shop by Wheel OEM	Wheel shop by Bearing OEM	Wheel shop by Bearing Recon dition	Wheel shop by Axle Manufactur er		by Wheel OEM	by Bearin OEM
WHEEL:1-C112	C112	Wheel Heat/Melt	Wheel(1) Heat/Melt	1234abcd	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C113	C113	Wheel Nominal Diameter	Wheel(1) Nom Diam	36	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C114	C114	Wheel Design Code	Wheel(1) Design Code	CH	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C115	C115	Wheel Plate Type	Wheel(1) Plate	StrPl, CrvS, CrvParab	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHEEL:1-C116	C116	Wheel Tape Size	Wheel(1) Tape	241.25	Wheel OEM 2D Bar Code		Yes				Yes	Yes	
WHFFI:1-C117	C117	Wheel New or	Wheel(1) New/Turn	N	Wheel OEM		Yes				Yes	Yes	



# The Reference File lists permissible values

For some data, the information must be recorded exactly as defined in the reference files. Incorrect data on a barcode will effect the value of barcoding for customers.

ELEMENT_DEFINITION_SQN	ELEMENT_ID	ELEMENT_NAME	DESCRIPTION
10	C003	Component AAR Facility Code	4-letter code uniquely identifying the facility whe
20	C004	Component Assembly Timestamp	Date/time when wheelset assembly is finalized at the
25	C005	Extended Wheelset Codes	These are internal codes, but designed to be includec
30	C006	Component Vendor Shipment Information	Optional. For use by component manufacturer/assem
60	C103	Wheel AAR Facility Code	Up to 4 character "QA Facility Code" maintained by A
70	C104	Wheel Manufactured Timestamp	Date that identifies the month, day, year and time of t
80	C105	Wheel Stamped Year	Wheel stamped year from manufacture. Physically s
90	C106	Wheel Stamped Month	Wheel stamped month from manufacture. Physically
100	C107	Wheel Stamped Manufacturer Code	1 (prior to 3-78) or 2-letter code that identifies the mar
110	C108	Wheel Stamped Class	The stamped wheel material class: A,B,C,D, U. Also
120	C109	Wheel Rim Thickness Side Scale Reading	2-digit number reporting the measured thickness of th
130	C110	Wheel Finger Gauge Reading	2-digit number reporting the flange thickness using St
140	C111	Wheel Stamped Serial Number	Serial number stamped into or cast on the wheel.
150	C112	Wheel Heat/Melt	Up to 8 digits or characters according to manufacture
160	C113	Wheel Nominal Diameter	2-character wheel diameter size, based on Wheel De

ELEMENT_VALID_VALUES_SQN	ELEMENT_DEFINITION_ID	VALID_VALUE	VALID_VALUE_LABEL	SORT_ORDER
1360	110	B	Heat Treated Wheels	1
1370	110	C	Heat Treated Wheels	2
1380	110	D	Alloy Wheels	3
1390	110	U	Non-Heat Treated or Unmarked	4
1400	160	28	28 inch wheel	1
1410	160	30	30 inch wheel	2
1420	160	33	33 inch wheel	3
1430	160	36	36 inch wheel	4
1440	160	38	38 inch wheel	5
1450	170	A	A Wheel Design Designation	1





# Wheel, Axle and Bearing OEM 2D Bar Codes



**WHEEL NEW**  
**GK 123456 11 / 01**  
**CH 36 D 241.25**

Rim / Finger : 22 / 0  
Plate: CrvS  
Facility: GRFI  
Heat: 1234ABCD  
Date: 2/1/11 18:55:12

**Railroad Wheel Corp**



**AXLE 6.5 x 12 F+**

SN / Heat: 123123 ABCDEF  
Type: RWS  
Class: 7  
Condition: 2  
Facility: GRFI  
Converter: ABCD  
Plating: AXIS1234  
Conv Date: 6/1/11 18:55:12  
Mfg Date: 2/1/11 18:55:12

**Railroad Axle Corp**



**BEARING NEW**  
**12345678 6.5 x 12**  
**11 / 01 GG**

Facility: TRBC  
Seal: HDL  
Cert: 01A  
Ring: SureFit  
Cage: STD  
Grease: 3201  
Date: 2/1/11 18:55:12

**Railroad Bearing Corp**





## 2D Barcodes are dynamic

Manufacturers will require bar code printers since the data on the bar code sticker is dynamic.

Serial numbers, dates, design specs all need to be printed in the code and in most cases human readable forms.

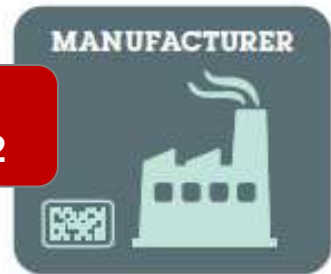




# CEPM-Wheelsets Process Flow

Jan 2012

Aug 2011



1 Manufacture, Barcode, & Ship Components



2 Assemble & Tag Components

EXAMPLE REGISTRATION DATA:  
• Manufacturers • Mfg Dates  
• Wheel Size • Lot Numbers  
• Serial Numbers



6 Update Component Status  
COMPOENT REPAIRS



3α Data Lookup

3 Register Component Details with Railinc

5 Report Repair via CRB or EHMS

7 Confidential Reporting



4 Ship Component to Repair Shop with Tag





Wheelset Assembly



# Wheel Shops – Keys to Success



Assemblers of Wheelsets will be responsible for accurate collection of bar code data from wheels, axles, and bearings. They will associate that data to a pre-printed 1D barcode that is applied to the assembled wheelset.

The complete wheelset data will be sent to Railinc and constitutes the Wheelset Registration.

## Key Documents;

- **AAR CEPM Bar Coding Specification (Wheelsets)**
  - Read the OEM 2D bar code for each wheel, axle, & bearing
  - Creation of 1D bar code for the wheelset
- **Wheelset Data Glossary**
  - Data Elements that need to be reported
- **Reference File**
  - Permissible Values





# Wheel, Axle and Bearing OEM 2D Bar Codes



**WHEEL NEW**  
**GK 123456 11 / 01**  
**CH 36 D 241.25**

Rim / Finger : 22 / 0  
Plate: CrvS  
Facility: GRFI  
Heat: 1234ABCD  
Date: 2/1/11 18:55:12

**Railroad Wheel Corp**



**AXLE 6.5 x 12 F+**

SN / Heat: 123123 ABCDEF  
Type: RWS  
Class: 7  
Condition: 2  
Facility: GRFI  
Converter: ABCD  
Plating: AXIS1234  
Conv Date: 6/1/11 18:55:12  
Mfg Date: 2/1/11 18:55:12

**Railroad Axle Corp**



**BEARING NEW**  
**12345678 6.5 x 12**  
**11 / 01 GG**

Facility: TRBC  
Seal: HDL  
Cert: 01A  
Ring: SureFit  
Cage: STD  
Grease: 3201  
Date: 2/1/11 18:55:12

**Railroad Bearing Corp**





# Wheel Shop – Bar Coding Specification

## AAR Manual of Standards and Recommended Practices

S-XXX

SEGMENT 1.0

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- 6 This standard defines the method and content of bar code labels on components to be tracked within the AAR systems. This will better support the management, administration and maintenance of railroad equipment assets by providing traceability of component performance throughout their life cycle.

Note:  
Specs for  
1D and  
2D bar  
code are  
in the  
same  
document



# Wheel Shops – Bar Coding Specification



```

<Wheel>
<C101></C101>
<C102></C102>
<C103>GRFI</C103 >
<C104>2/1/2011 18:55:12</C104 >
<C105>11</C105 >
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<C114>CH</C114 >
<C115>CrvS</C115 >
<C116>241.25</C116 >
<C117>N</C117 >
<C118>AMST1234</C118>
</Wheel>

```



	<b>WHEEL</b>	<b>NEW</b>
	<b>GK 123456 11 / 01</b>	
	<b>CH 36</b>	<b>D 241.25</b>
Rim / Finger : 22 / 0		
Plate: CrvS		
Facility: GRFI		
Heat: 1234ABCD		
Date: 2/1/11 18:55:12		
<b>Railroad Wheel Corp</b>		



# Decoding the Data in the Bar Code

The Data Glossary describes the data, who is required to report the information, and which barcode the data should be reported on.

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WHFFI:1-C117	C117	Wheel New or	Wheel(1) New/Turn	N	Wheel OEM		Yes				Yes	Yes	



# The Reference File lists permissible values

For Wheel Shops, they will want to verify that the data on the bar code is valid before registering with Railinc.

ELEMENT_DEFINITION_SQN	ELEMENT_ID	ELEMENT_NAME	DESCRIPTION
10	C003	Component AAR Facility Code	4-letter code uniquely identifying the facility whe
20	C004	Component Assembly Timestamp	Date/time when wheelset assembly is finalized at the
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110	C108	Wheel Stamped Class	The stamped wheel material class: A,B,C,D, U. Also
120	C109	Wheel Rim Thickness Side Scale Reading	2-digit number reporting the measured thickness of th
130	C110	Wheel Finger Gauge Reading	2-digit number reporting the flange thickness using St
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1380	110 D	D	Alloy Wheels	3
1390	110 U	U	Non-Heat Treated or Unmarked	4
1400	160	28	28 inch wheel	1
1410	160	30	30 inch wheel	2
1420	160	33	33 inch wheel	3
1430	160	36	36 inch wheel	4
1440	160	38	38 inch wheel	5
1450	170 A	A	A Wheel Design Designation	1





# Code 39



Variable Length  
Commonly used for up  
49 characters

Readable by almost  
any bar code reader

No Check Digit

Code 128 is preferred  
over Code 39





# Code 128



Variable Length  
Commonly used for  
shipping and packaging  
industry

Readable by almost  
any bar code reader

Includes a Check Digit

Code 128 is preferred  
over Code 39





# 1D Barcode can be pre-printed

Wheel Shops can preprint barcodes since the data is serialized.

This also enables centralized management of the codes for multiple location wheel shops.





# Prerequisites to Component Registration



1. Contact Railinc
  - Get a Company ID
  - Register for an SSO User ID
2. Read the User Guide and Specifications to understand the requirements for reporting
3. Request Access to Umler from your Umler Company Administrator (that may be you)
4. Request Component Maintenance Access from your Umler Company Administrator
5. Determine how AAR Component IDs will be managed by your company



# Wheelset Registration with Railinc

Companies have two ways to register a wheelset  
Railinc.com

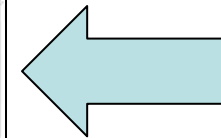
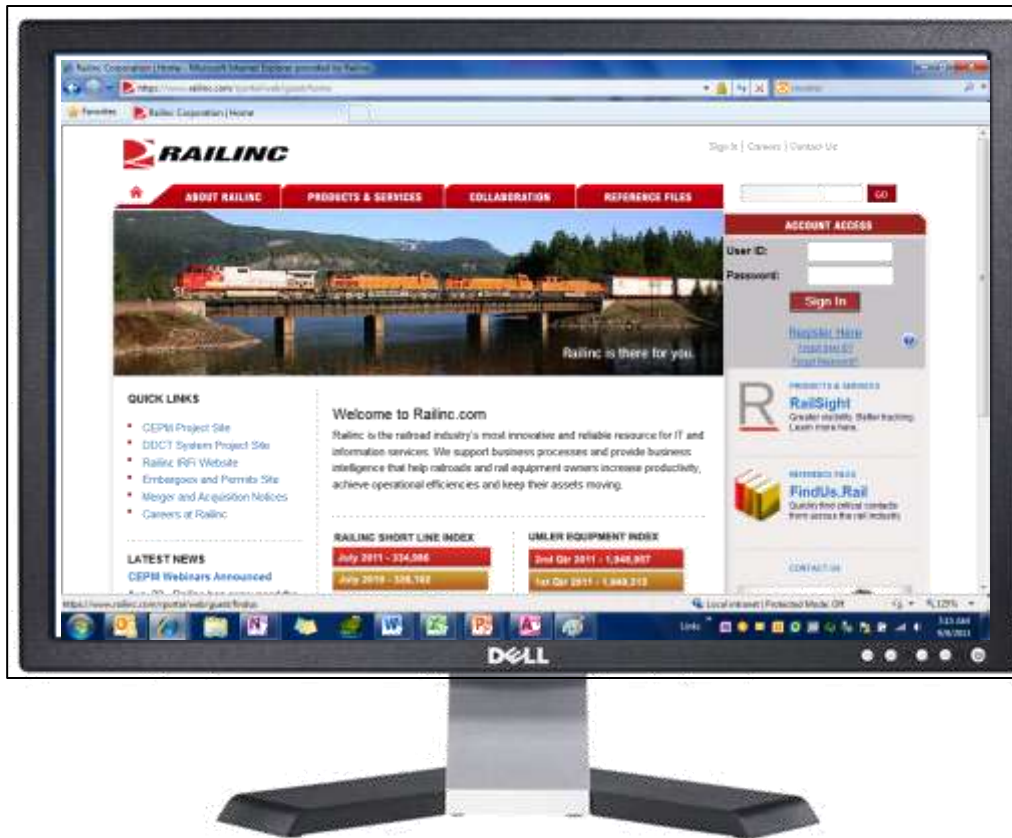
- Input one wheelset at a time
- Upload CSV

XML via Web Services – Real time transactional  
integration

Web Service will allow Wheel Shops to automate  
reporting of information through their own systems



# Comp Registration via the railinc.com website



Login with  
your SSO  
User ID



# Login to the Umler system



Launch Pad

RTSOLIS : RAIL - RAILINC CORPORATION [Contact Us](#) | [Sign Out](#)



## Your Applications

- ATSI (Committee Site)
- Early Warning
- EHMS
- Embargoes (Committee Site)
- FindUs.Rail
- Railinc Messaging Console
- UMLER/EMIS

## Your Notifications

[Current Notifications](#) [Past Notifications](#)

Date	Type	Subject
No Notifications		

## Your Support Cases

[Your Open Cases](#) [All Your Cases](#)

There are no cases to show

Customer Support 1-877-RAILINC  
Support Hours: Monday - Friday, 0700 - 1900 Eastern Time

[Create a New Case](#)

## Your Subscriptions


Application	Type	
UMLER (Committee Site)	Outage	<a href="#">[unsubscribe]</a>
UMLER/EMIS (Committee Site)	Outage	<a href="#">[unsubscribe]</a>
Single Sign On System	Outage	<a href="#">[unsubscribe]</a>
UMLER O & M	Outage	<a href="#">[unsubscribe]</a>
Circular OT-5	Release	<a href="#">[unsubscribe]</a>
EHMS	Release	<a href="#">[unsubscribe]</a>



# Select Registration from the Component Registry Menu

Home | Query | Maintenance | Upload / Download | Railinc Admin Functions | Account Administration | Contact List | **Component Registry** | Help | Re

Registration  
Associate Component



## Welcome to Umler - Umler Equipment Management Information System

The **Umler** Equipment Management Information System is a mission-critical Rail Industry database and suite of applications that store and communicate data pertaining to the massive inventory of railway equipment used by the industry. The physical characteristics and restrictions of equipment, status and management information that are contained in Umler® are critical to the industry.

The communication of rail equipment data provides for the safe movement of traffic, smooth interchange of traffic between carriers and means to provide rail customers with the right pieces of equipment for their shipment.

### News and Updates

**\*\* Umler 3.6 Release postponed until Wednesday evening Oct 27th \*\***  
Train II and Web Service customers need to be advised that reference files for Umler 3.6 release were not implemented Oct 26th.

**Oct 26th, 2010 - Umler 3.6 New Features**  
Railinc release new features and updates in the application on Oct 26th.

- Superstructure Project – Visibility of Superstructure data for a superstructure owner.
- Locomotive data updates and inspection rights for Umler Owners.
- Enable specific updates to data across platforms for drawbar and articulated equipment
- Calculation of Air Brake Test Due Dates now 'exactly 12 months' instead of '1st of month after 12

- [Release Notes](#)
- [Umler User Guide](#)
- [Umler Data Specification Manual](#)

If the Registration menu is not visible, request “Component Maintenance Access” from your Umler Administrator.



# Option #1 - Component Registration Interface

**RAILINC** | Umler | RTSOLIS : RAIL - RAILINC CORPORATION | Launch Pad ▾ | Contact Us | Sign Out

Home | Query | Maintenance | Upload / Download | Railinc Admin Functions | Account Administration | Contact List | Component Registry | Help | References | 🔍

Search | Add New | Upload CSV

### Add New Component to Registry

AAR Component ID:

Company Code:

Component ID Number:

Component Type:

Done | Local intranet | Protected Mode: Off | 100%

Enter information for each component to register. Good for beginners.





## Option #2 – Upload via CSV

The screenshot displays the RAILINC Umler web application interface. At the top, the RAILINC logo is on the left, and the user name 'Umler' is in the center. To the right, there are links for 'RTSOLIS : RAIL - RAILINC CORPORATION', 'Launch Pad', 'Contact Us', and 'Sign Out'. Below this is a navigation menu with tabs for 'Home', 'Query', 'Maintenance', 'Upload / Download', 'Railinc Admin Functions', 'Account Administration', 'Contact List', 'Component Registry', 'Help', and 'References'. The 'Upload / Download' tab is active, and within it, the 'Upload CSV' sub-tab is selected. The main content area contains a text box with the instruction 'Browse files to find a components CSV'. Below this is a form with a 'Filename.csv:' label, a text input field, a 'Browse...' button, and a link for 'Download csv format templates'. A 'Submit' button is located at the bottom right of the form. The browser's status bar at the bottom shows 'Done', 'Local intranet | Protected Mode: Off', and a zoom level of '100%'.

More Efficient way to register components. Refer to the CSV Upload Guide as well as templates that are available.



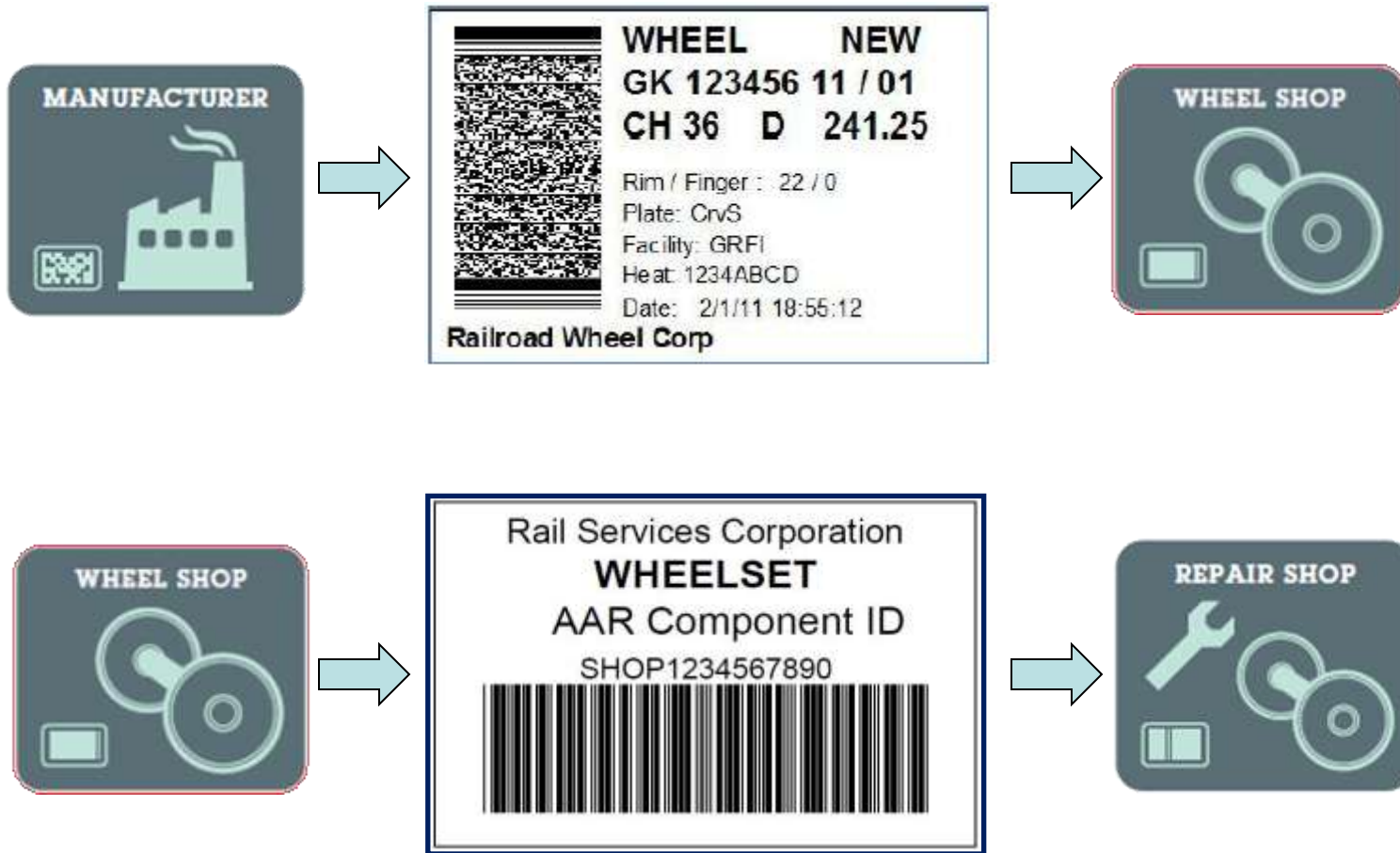
## Option #3 – Web Services Integration

If your company is interested in the technical specification for integrating your products with the Umler Component Registry, please contact [csc@railinc.com](mailto:csc@railinc.com)

Railinc can provide WSDLs and technical specifications to get you started.

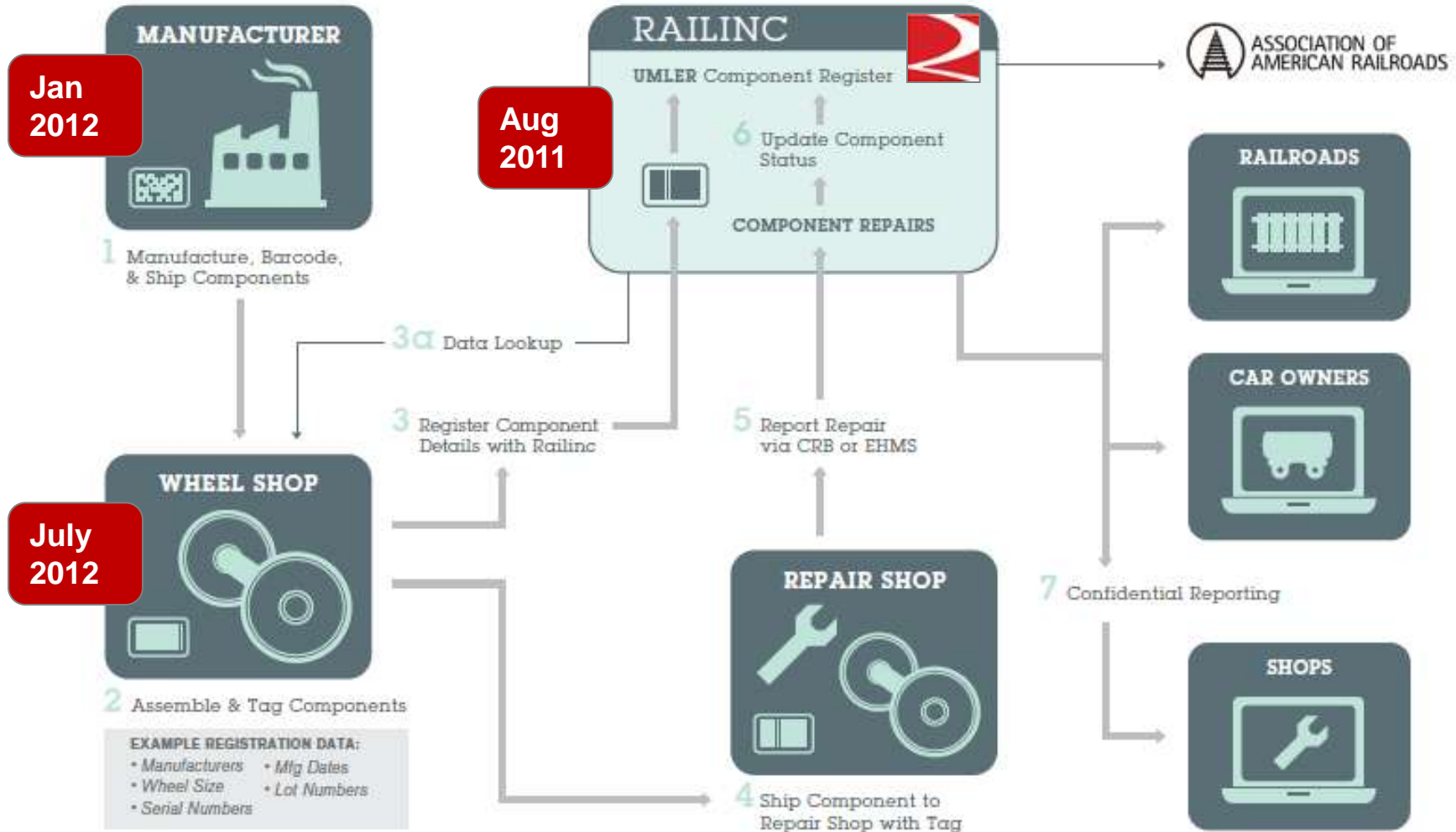


# Communicating data through Bar Codes



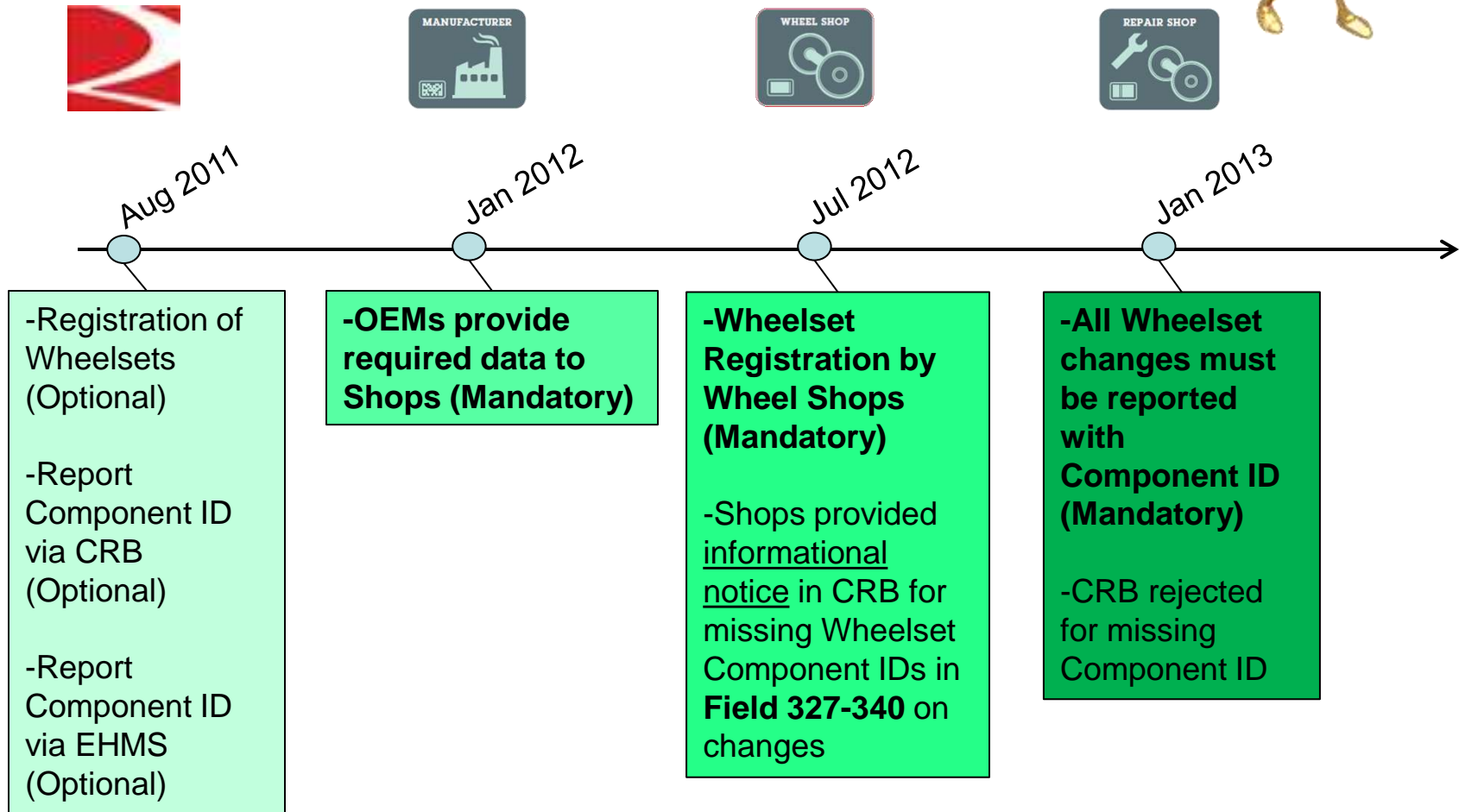


# CEPM-Wheelsets Process Flow



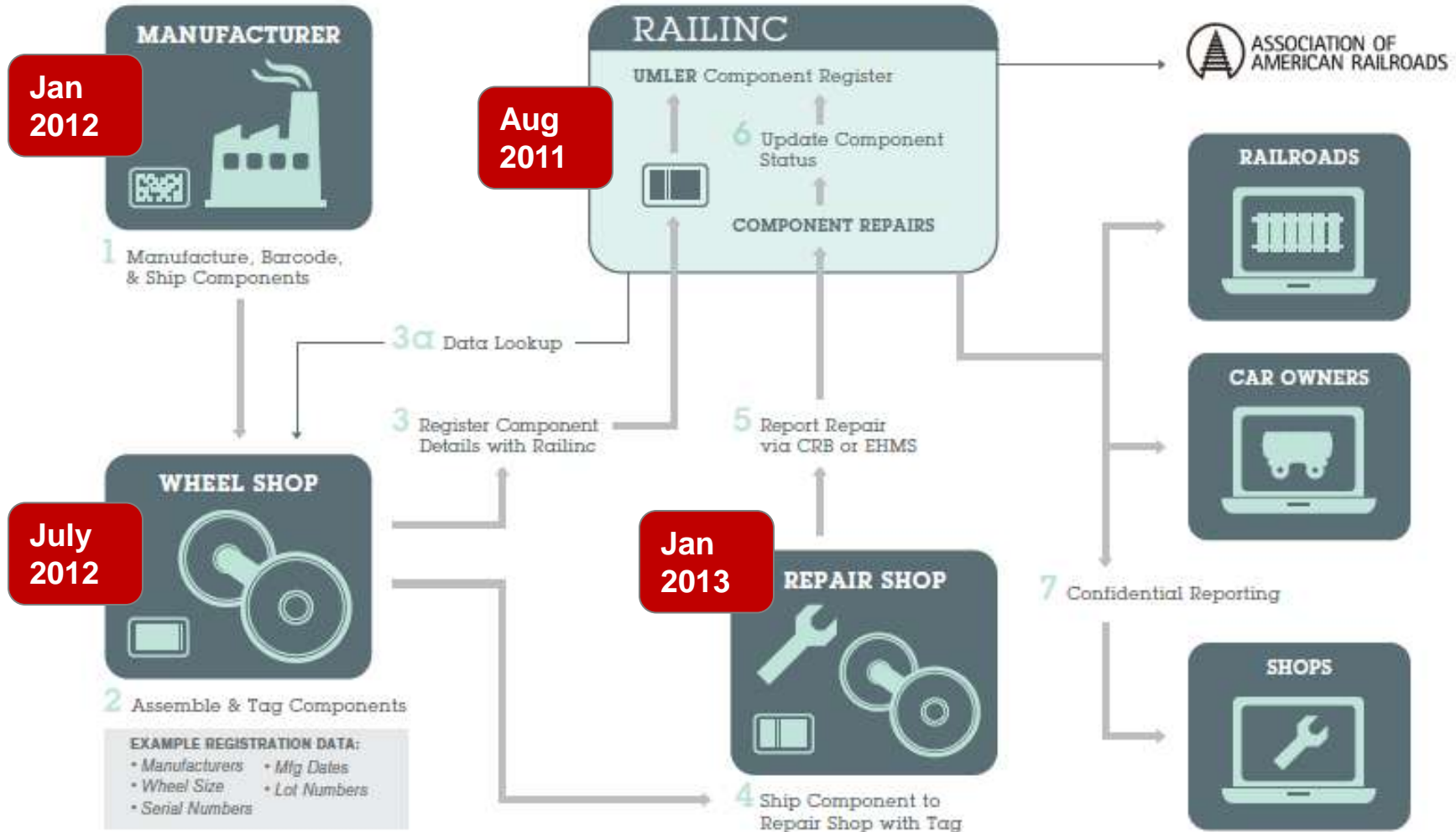


# CEPM Industry Timeline





# CEPM-Wheelsets Process Flow





# CEPM-Wheelsets Progress to-date

- Major capabilities for CEPM registration and tracking are already in place
- Railinc.com/CEPM website launched in June to provide central place for communications
- June Circular formally introduced CEPM to the industry
- July 12<sup>th</sup> AAR/CEPM Town Hall in Chicago to discuss CEPM with wide audience of stakeholders
- Broad communication effort to educate committees regarding CEPM program objectives and timelines
- August launch of initial Umler Component Registry capabilities to facilitate communication and planning for CEPM
- Circular letter requesting feedback and comment to WABL by Oct 15<sup>th</sup> Bar Code and Data Glossary.
- AAR/CEPM Town Hall #2 tentatively set for November 9th (circular will be forthcoming)







# CEPM Roadmap

2012 – Wheelsets (Freight Cars)

2013 – Castings – Side Frames, Bolsters, Couplers

2014 and Beyond

- Brake Systems

- Locomotive – Engines, Turbochargers, Traction motors

- Tank Car – Valves, Appliances

- Intermodal Components – Hitch, Auxiliary Power

- Tracing - PTC Devices, GPS



## Need More Information

WABL Committee - *Ken Rownd – AAR Committee Manager*  
[csc@railinc.com](mailto:csc@railinc.com) – *Registration and Web Services*  
[www.railinc.com/cepm](http://www.railinc.com/cepm) - *project website*

**Component Registration and Reporting Component Application:** This session will discuss component registration, reporting of the application of components to equipment, and how repair shops can plan to meet application-reporting requirements associated with CEPM-Wheelsets.

- Thursday, November 10, 2011
- 2 p.m. to 3:30 p.m. (ET)
- Recommended for wheel shops, OEMs, repair shops and software providers