AIAG
Automotive Industry Action Group
Report on the State of RFID in North America

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For the lack of a RFID Standard the Kingdom was almost lost . . .

☺ Good News – Late 80's the automotive industry deployed RFID in assembly and component plants from a major industrial controls vendor.

☺ Proprietary Standard took hold.

☝ Announcement – 99' major industrial controls vendor drops products in the automatic identification space including bar code scanners and RFID.

✋ Scramble – find a source to build to the propriety standard.

😐 Tell me it's not so – no one would build an equivalent.

🕸 Solution – lots of vendors were only too pleased to provide their propriety solutions.
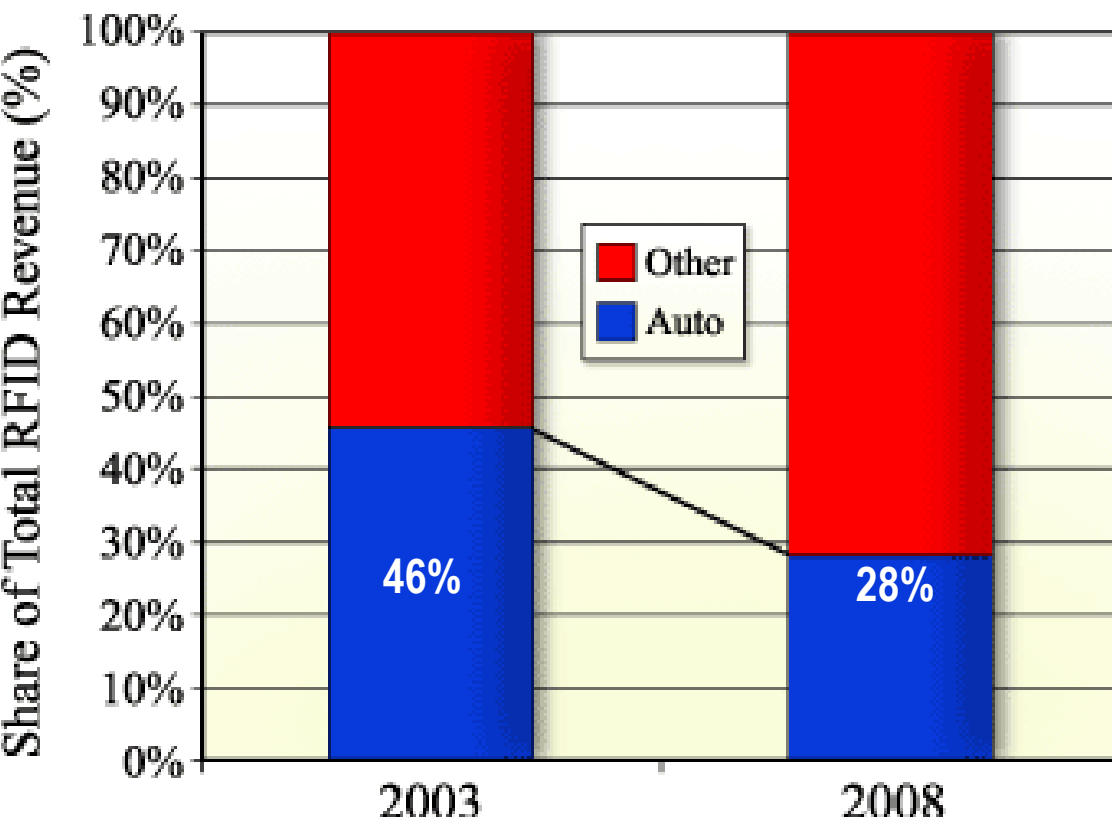
☹ Woo is me – no interchangeability, no interoperability

Automotive Industry Drives the RFID Market, Retail Still Waiting For Shoppers", According to ABI

Automotive Industry Spending on RFID
World Market: 2003 and 2008
(Source: Allied Business Intelligence Inc)

Despite all of the recent hype and excitement surrounding the introduction of radio frequency identification (RFID) technology in retail markets, the automotive industry will spend nearly thirty times more on the technology this year.

Key applications of RFID technology in vehicles include immobilizers, automatic vehicle identification, and passive entry systems.

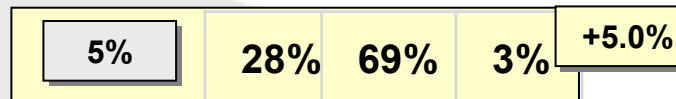http://www.abiresearch.com/abiprdisplay2.jsp?pressid=

RFID Technology Development

% 2004 IT Budget Spending on RFID Technology

Change in 2005
Increase → Same → Decrease

2005 Growth

| 5% | 28% | 69% | 3% | +5.0% |

RFID Technology Deployment

	Currently Using	Implement in 2004	Plan to evaluate in 2004	Plan to evaluate in 2005	No plans
Manufacturing Processes (Process Control)	38%	9%	21%	6%	26%
Manufacturing Processes (Event Management)	28%	15%	19%	13%	25%
Material Management (Part Replenishment)	28%	7%	26%	10%	28%
Flexible Manufacturing (Product identification, routing and tracking)	25%	15%	19%	16%	25%
Asset Utilization (Industrial Equipment Management)	22%	15%	16%	13%	34%
Asset Utilization (Container Tracking)	22%	15%	13%	18%	32%
Manufacturing Processes (Hazmat Tracking such as paint or cleaning chemicals)	18%	15%	24%	13%	31%

RFID Drivers – next 12 months
Those spending on RFID Technology

Customer Vehicle Features - such as passive vehicle entry or vehicle immobilizer

Asset Management - such as the tracking of re-usable racks or high value components — 30%

Government compliance - such as the Tread Act (tracking of tires by TIN) — 11%

Retail Channel Mandates - such as Walmart RFID Compliance Mandate — 11%

Other — 8%
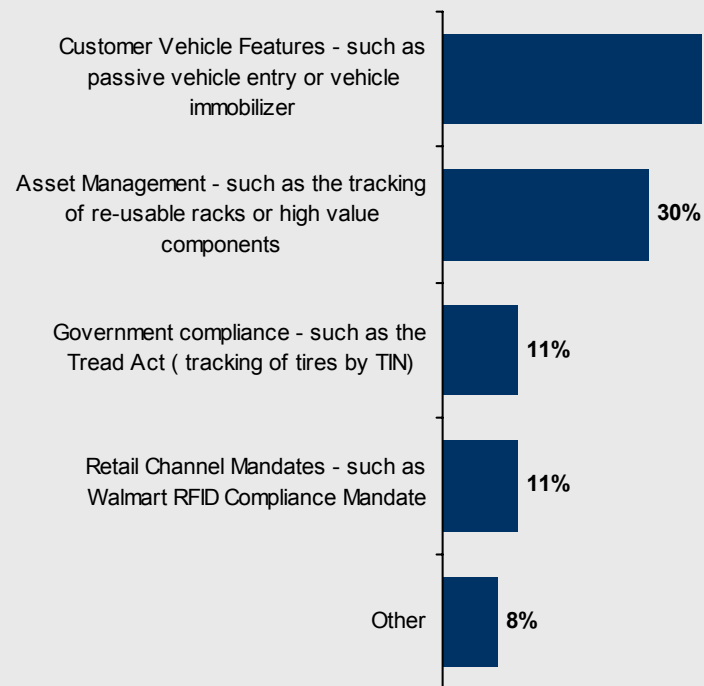
Automotive Application - Vehicle Security System (Immobilizers)

Tamper proof and secure, with a unique identification code contained in each transponder ensures that automotive immobilizers offer the highest levels of security.

A reader in the ignition system transmits a signal to the transponder that answers back with a unique identification code allowing the vehicle to start.

More than 16 million vehicles around the world are equipped with immobilizers.

Automotive Application - Customer Payment System

RFID is advancing pay at the pump with more speed and convenience, it has provided hassle free automated transactions provided by RFID based payment systems.

Speedpass is being used by over 3 million Americans in the USA and at all of Mobils filling stations in Singapore.

Singaporeans were already acquainted with RFID as they are using a RFID based toll collection system named Electronic Road Pricing (ERP)
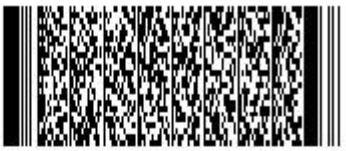
The Automotive Industry is Standards Driven

The AIAG Created the FIRST . . .

✓ **Code 39 Standard (AIAG B-1 '84)**

> **- (MH10.8M '83)**

✓ **Identifier Standard (AIAG B-6)**

> **- (Created Data Identifiers)**

✓ **Shipping Label Standard (AIAG B-3 & B-5)**

✓ **Part Identification And Traceability Standard**
> **- (AIAG B-4)**

✓ **ARF-1 Application Standard for Radio Frequency Devices in the Automotive Industry October 1991**

✓ **Global Transport Label Standard**

> **- (AIAG B-16 - '02) ISO 15394 - '99**

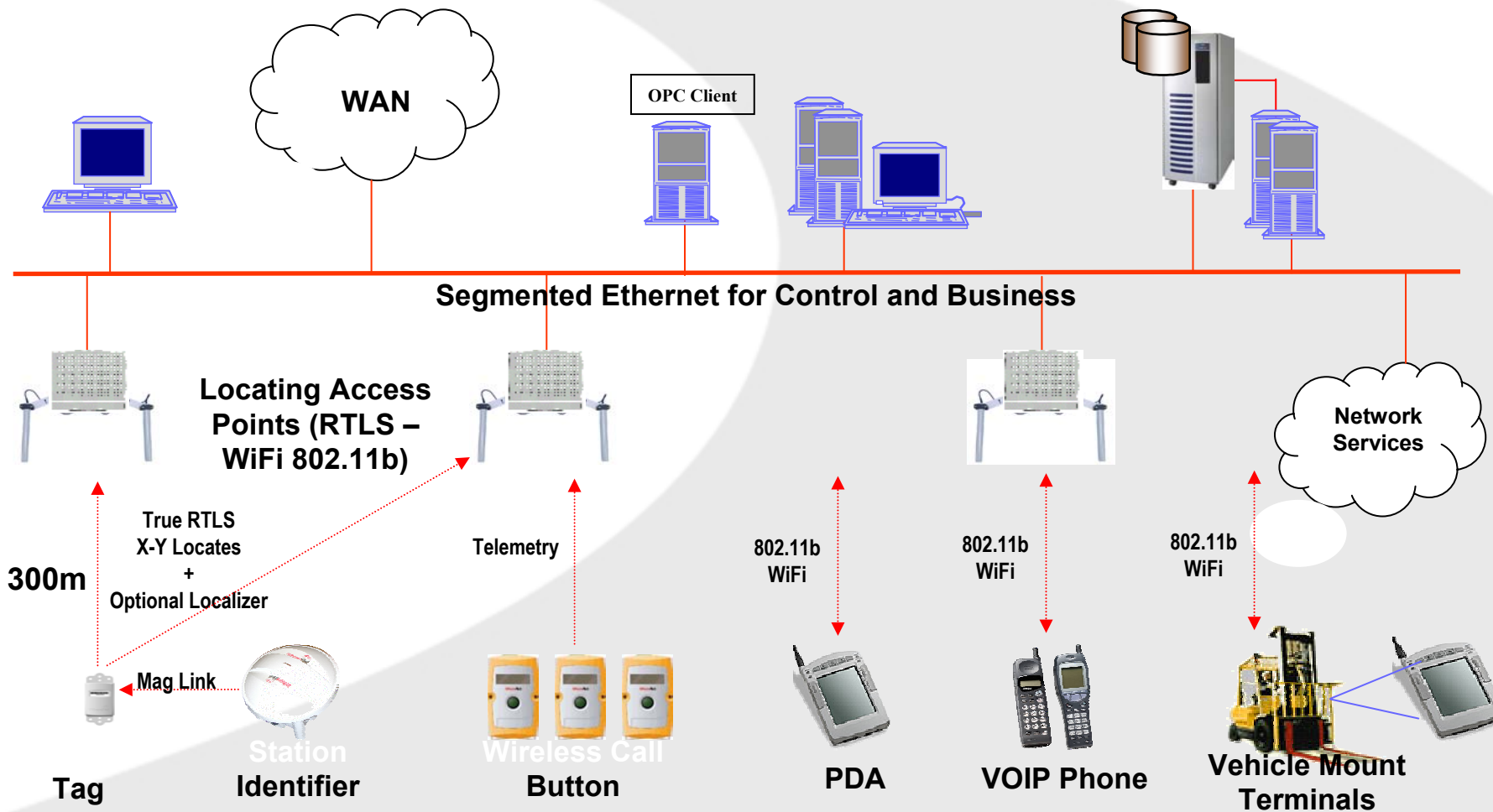✓ **Tire & Wheel Identification Standard (Optical & RFID)**

> **- (AIAG B-11 – '02)**

Application GM 1724 (B16) Global Common Shipping Label + RFID = *SMART LABEL*

RFID inlay imbedded within label material

Wireless Infrastructure Using ANSI 371.1 and IEEE 802.11b, g

WAN

OPC Client

Segmented Ethernet for Control and Business

Locating Access Points (RTLS – WiFi 802.11b)

Network Services

300m

True RTLS X-Y Locates + Optional Localizer

Telemetry

802.11b WiFi

802.11b WiFi

802.11b WiFi

Mag Link

Tag

Station Identifier

Wireless Call Button

PDA

VOIP Phone

Vehicle Mount Terminals

AIAG and RFID

- Early AIAG RFID standards work **(ARF1, "Application Standard for RFID in the Automotive Industry"** published in October, 1991) did not lead to wide adoption, nor participation, due to;
    - proprietary RF protocols / technologies
    - AIAG's requirement for open standards.

- The ARF-1 has been surpassed by more recent standards work and by increased technological capabilities.

RECENT HISTORY: RFID

• **Recent standards from international (ISO) and national (ANSI) committees are "enabling" the use of RFID - today.**

• Benefits; technology adopters who use "standards" can utilize the latest in RFID technology, without the need to continually restructure their process(es).

• Three standards of importance to AIAG's RFID efforts;
  • **ISO 15434; Transfer Syntax for High Capacity ADC Media**
  • **MH10.8.4; 2001: Section 3; Air-Interface Protocol**
  • **ISO 18000-6; RFID Air interface - 860 MHz to 930MHz**

• Emerging standard of importance to AIAG's RFID efforts;
  • **UCC/EAN: EPC; Retail**

RECENT HISTORY: RFID; Continued

• ANSI selected the air-interface protocol for the MH10.8.4 RFID standard based on an RFID technology "shoot-out" in October, 2000.

• Based on the ANSI success, the AIAG conducted an RFID Roundtable on 2/15/01 to show that there are benefits of RFID to the auto industry - **today**.

    o The goal was to have the automotive industry participate in RFID standards-development work within the AIAG to meet real-world needs.

• A Work Request was submitted to the AIAG, and the first meeting of the **RFID Tire and Wheel Identification** workgroup was held on 2/20/01.

• The workgroup met *every* **Tuesday**, and averaged 20 members at each meeting.

• Sitting members of the workgroup consisted of the major automakers, the global tire manufacturers and major RFID technology providers.

Work on the *New* B-11; Label-Version b

- **The auto industry and it's supply chain wanted an RFID-based Identification and Traceability solution as soon as possible.**

- Because of time, the AIAG RFID Tire and Wheel Identification committee decided to modify the 1994-released Label-only B-11.
    - **Work started 2/20/01 on an updated label-version**
    - **Completed by 3/27/01**; issued as an Interim Report.

- Based on AIAG's B-4 *Parts Marking and Identification* standard, the 2D symbology Data Matrix was chosen to replace Code 39.

The label is 1.0"x 1.25", and contains
23 characters.

B-11: Project Progression

• Referenced earlier was the need to develop an RFID standard ASAP!

• To test out the various technologies, AIAG sponsored an all-day RFID Technology Evaluation in its parking-lot.

• RFID technology providers were invited to "run what ya' brung" to see just what was possible.

• Frequencies from 125 KHz (LF), to 13.56 MHz (HF) to 915 MHz (UHF) were tested.

• **Based on test data-supported overall performance**, the committee determined to pursue UHF-based technologies.

B-11: Project Progression; continued

Since the AIAG approved the B-11, refinements to, and extensive testing of, the technology has continued right on through to the present.

Both outside-the-tire and inside-the-tire RFID tags are under development, and have shown very successful test results, far exceeding the B-11-required read / write distances.

Pilot quantities of RFID-tagged tires early 2004.

The B-11 RFID Tire and Wheel Identification standard…

…is the first **tracking and traceability** standard in the world for "*ITEMS*"!

B-11: RFID Specifications

Configuration;
- **Passive**
- **Read / Write; at a minimum of 24 inches from the tire.**

Memory;
- **Minimum 128 bytes (1024 bits) of total memory.**
    - o **Minimum 110 bytes (880 bits) of user-addressable memory**

Frequencies;
- **UHF**
    - o **Not specifically defined, but understood to mean 860 MHz to 950 MHz**

Protocols;
- **MH10.8.4; 2001, Section 3: air-interface**
- **ISO 15434: data syntax (industrial)**
- **UCC/EAN: EPC (Data ONLY; retail)**
    - ➢ The B-11 supports **BOTH** industrial- and retail-based data on the same tag; as long as the relevant data-syntax is followed.

Material Management & RFID

- Re-usable rack for engines/transmissions
  - Driver: lost racks and component quality
- Plant Inbound Transport Check-in
  - Driver: Elimination of manual steps/visibility
- Material movement on Plant Floor
  - Driver: Reduction in assembly/material errors
- Compliance to Customer Mandates
  - Driver: Retail requirements for spares/after mkt

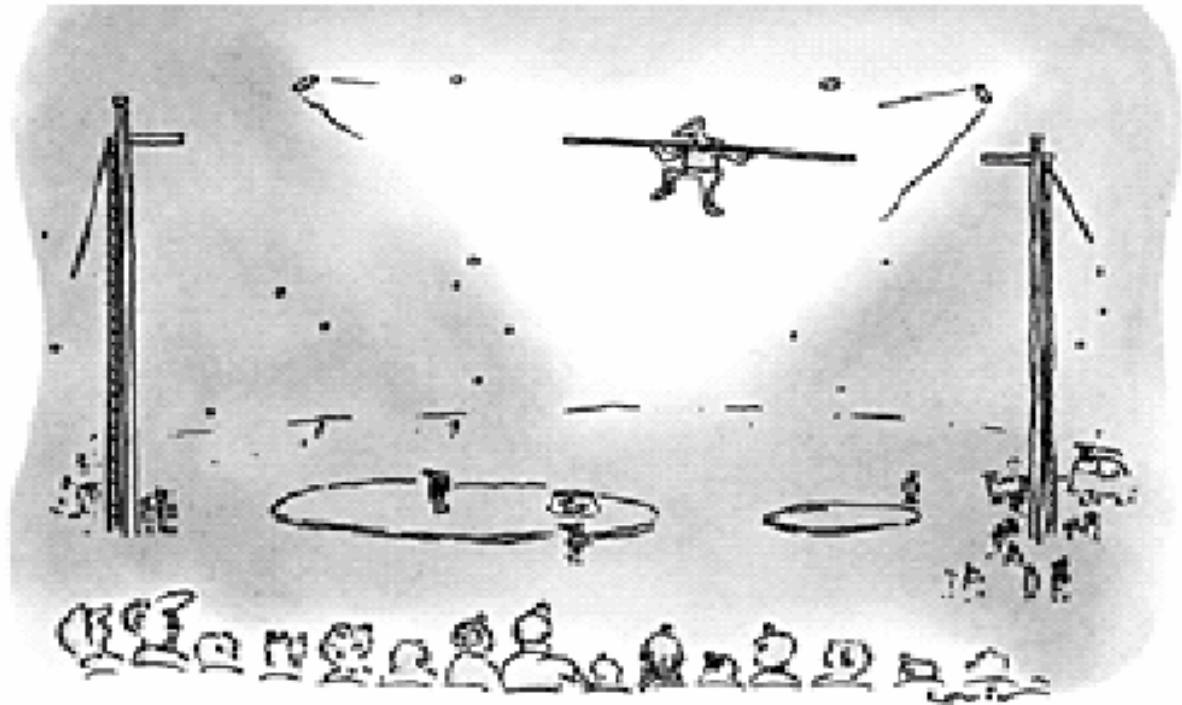# There are no shortage of RFID standards, there is a need for RFID application guidelines.

-Recent ISO article

Automotive has not issued RFID mandates, but most major companies are conducting RFID pilots

RFID

„It apppears to be some kind of wireless technology"

- **RFID isn't a tightrope walk but nevertheless it is very exciting**

On Behalf of the 1,600 member companies of AIAG

Thank you

www.aiag.org