

The RuBee PAVE Project

Patient and Asset Visibility Exchange (PAVE™)

Visibility Has the Potential to Reduce US Healthcare Costs by 10-20% with Accurate, Process-Free, Real-Time Patient Flow Data, Staff Flow Data and Mission Critical Asset Management.

Sunday, November 16, 2008, Version 1-6

Healthcare Cost Reduction

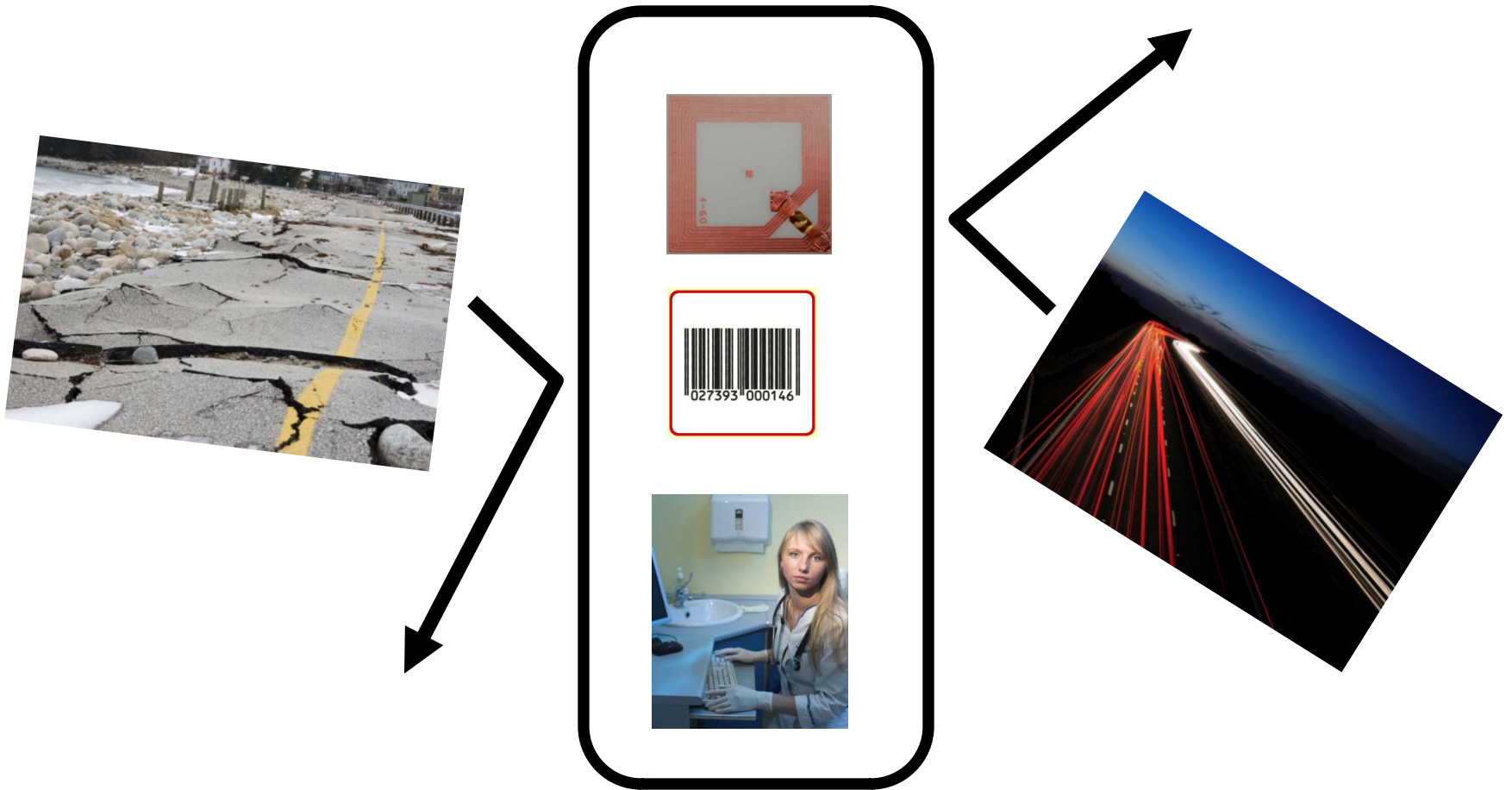
Modern Information Technology (IT) has the potential to move us from a poorly maintained, broken manual information highway to a high speed, automated information highway that can reduce healthcare costs with better outcomes and improved patient safety.....



But one thing stands in the way....

Manual Data Entry

Leads to High Data Costs



Manual data entry using keyboards, barcodes or RFID destroys possibility of a real visibility ROI; all three require large scale process change, training and significant increases in costs.

Manual Data Entry Leads to High Unreliability

*“One of the lessons of the Urgent Matters project is that it is difficult to change something that is not accurately measured. For example, if a hospital does not know how long patients spend on each step of their treatment (e.g. triage, registration, waiting for a bed, etc.), then it is impossible to identify bottlenecks and opportunities for improvement....” **

* Adapted From [Urgent Matters](#): Bursting at The Seams; Improving Patient Flow to Help America’s Emergency Departments, September 1, 2004 Bruce Siegel.

Automatic PAVE Data Entry

Leads to Low Data Cost and High Data Reliability.



Visibility Engine

**High Speed Throughput
and Cost Reductions**

RuBee Visibility networks, offer reliable, fully automatic data entry, with no process change, minimal training with expected cost reductions in the 15% to 20% range. Visibility offers a clear, cost-effective path to enhanced patient throughput with no change in process. RuBee PAVE builds an efficient information highway leading to high speed, efficient, lower cost, safety-enhanced outcomes.

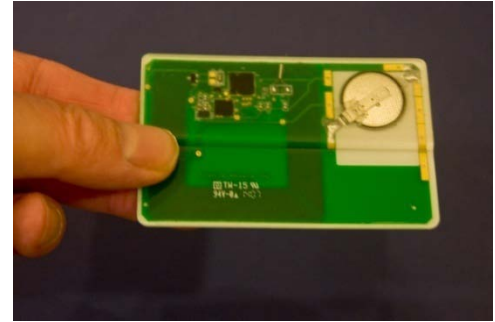
RuBee Visibility Tags



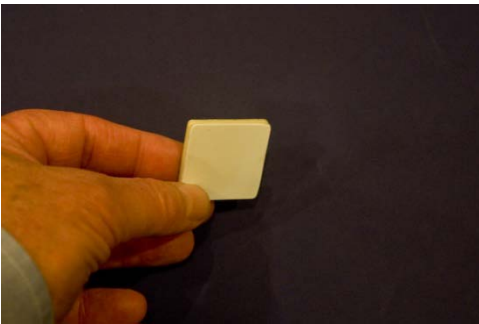
Heavy Duty Equipment
PT-Tag



Human ID 1T-Tag



Wallet ID 2T-Tag



Asset CP-Tag

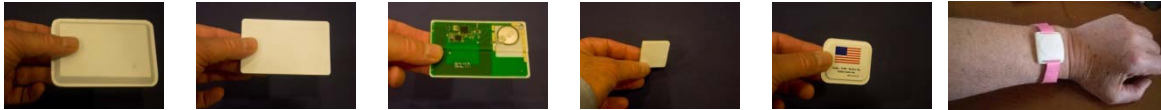


Asset TM-Tag



Wrist Band Tag

RuBee Visibility Tags



RuBee Tags are tiny, low cost, secure, wireless, networked servers – with a CPU, memory and the ability to read and write stored data over the RuBee network – RuBee tags and components are manufactured by Epson/Seiko – the world leader in low power silicon.

- ✓ 5-10 year battery life, 10-50 foot range
- ✓ Optional Sensors (temperature, jog)
- ✓ Mask Programmable Processor
- ✓ Optional AES Encryption
- ✓ Full Read Write sRAM – 500Bytes to 2Kbytes
- ✓ Data Storage in the Tag
- ✓ Optional Mil Spec 810F
- ✓ Optional UL 913 HERO
- ✓ Work in harsh environments (metal, people, liquids)

Data is in The RuBee Tag



Patient data and chain of custody data may be stored in local tag memory. Audit trails and backup are maintained in optional remote databases. Patient flow data is captured as the patient moves through the Hospital

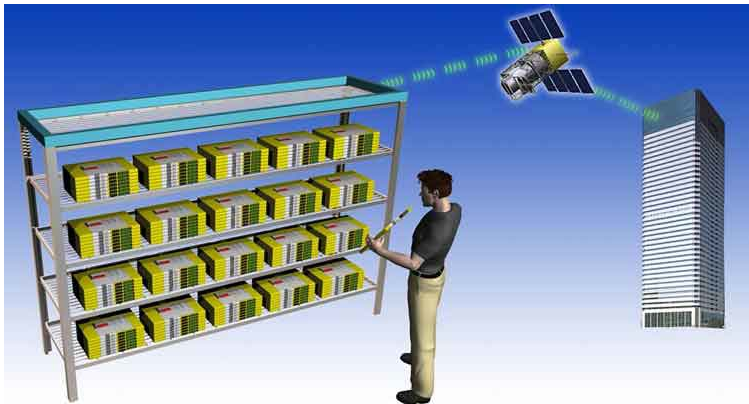
Item	Value
IP Address	192.145.67.99
Subnet	145.23.5.15
Patient Name	Rena Carlos
Patient ID	56889934
Birth Date	10/02/90
Blood Type	O +
Allergies	NA
Arrival Time	10:23



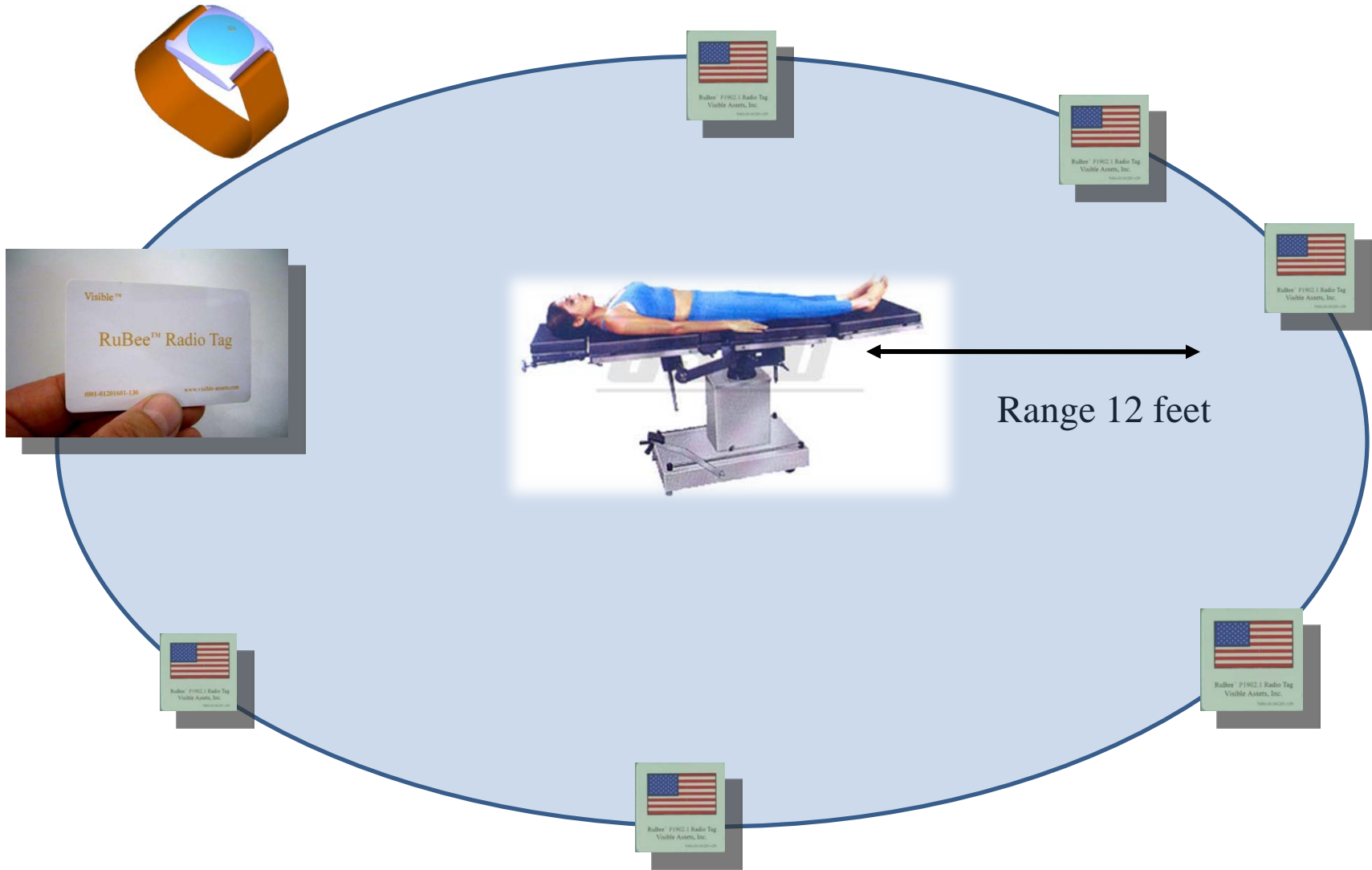
Data is in The RuBee Tag

Data is stored in the Tag. Data may be read with a shelf or other “RuBee Appliances” with integrated antennas. Sensors can provide pedigree for perishables, blood products, biologics and jog/shock for sensitive equipment. Data is also captured and stored in an optional central network via a Dot-Tag Visibility engine .

Item	Value
IP Address	192.145.67.89
Subnet	145.23.5.5
UPC Code	234567789
Serial No.	A56772232
Mfg. Date	10/02/06
Expiration	10/02/09
Temperature	Low 19C High 27C
Jog Shock	23 Units



RuBee Visible Procedure Room



A RuBee antenna strategically placed on an OR table and networked to a RuBee router creates a local RuBee network and may read/write to 100's of RuBee Tags within an antenna volume.

PAVE = Real-Time Status and Visibility



A RuBee-equipped PAVE facility can enhance safety by managing human resources, patients and mission-critical assets with no process change. It provides asset status (expiry dates and temperature) and asset pairing (blood type matches patient). Asset pairing may be carried out automatically with no human action/ no human process. For example, a message may be broadcast to all parties: “Blood type is a match OK to proceed”, or “We have the wrong blood type on OR 23.”

Blood is OK and a match to the Patient



Item	Value
IP Address	192.145.67.99
Subnet	145.23.5.15
Blood Type	AB
Bag ID	56889934
Collection	10/02/09
Exp Date	11/12/09
Temp	10, 13
Arrival Time	10:23

Item	Value
IP Address	192.145.67.99
Subnet	145.23.5.15
Name	Tom James
ID	56889934
Entry	11/5/09
Birth	11/05/90
Blood Type	AB
Allergies	NA

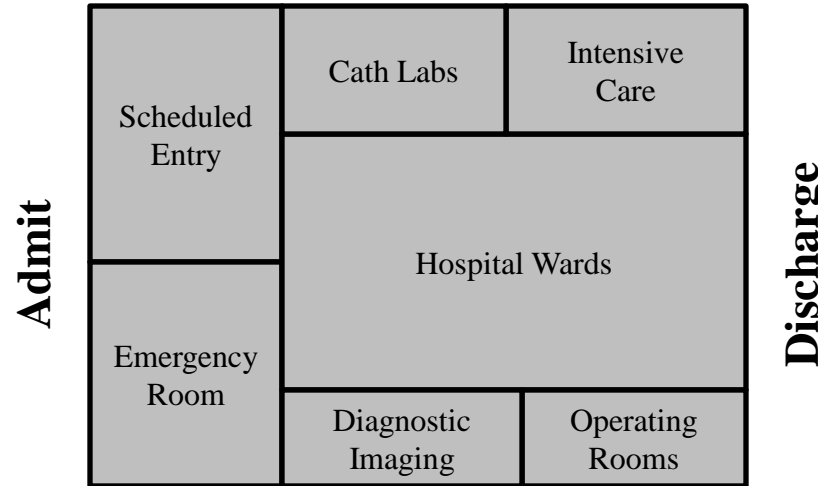


PAVE = Increased Patient Throughput



Current Systems
No Managed Patient Flow

→ 4 Days



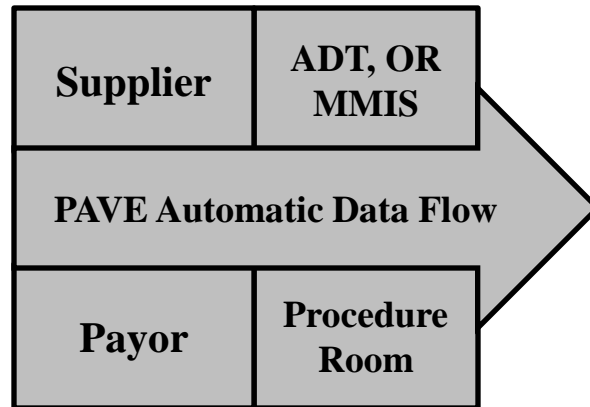
→ 3 Days

PAVE Systems
Optimized Managed Patient Flow

Based on existing independent studies a RuBee Visibility Network has the potential to increase patient throughput by 20% to 30% and reduce costs by 10% to 15%.

PAVE = Improved Asset & Data Flow

Current Systems
Chaotic Manual Asset Data Flow



PAVE Systems

10-20% Loss Reduction

10-20% Direct Costs Reduction

10-20% Improved Transaction Efficiency

Based on existing data Procedure Room RuBee Visibility Network has the potential to decrease asset losses by 20%, reduce direct costs by 20% and reduce time to bill, report and pay by 20%

PAVE = Real-Time Status and Visibility



RuBee provides remote real-time visibility with
No Change in Process



Since data is stored in the tag, asset identity, status, pedigree and chain of possession may be read and confirmed remotely, in the field without any links or connection to a database.

Since RuBee is not line-of-sight a RuBee reader can discover tags, confirm identity, status and pedigree with no change in human process. In other words handhelds can optionally be used to collect field data, but in a properly configured network handhelds and PDA's are not necessary and obsolete. Visibility is real-time and automatic and process free

When a network link is available, Visibility may be audited, monitored and managed from anywhere on the planet.

RuBee Visibility References

RuBee Visibility Application Examples

[Sig Sauer Weapons Visibility](#)

[Trimble Mobile Visibility](#)

[Air Force Tool Networks](#)

[Orthopedic Implant Visibility](#)

RuBee Technical Background

[RuBee vs RFID](#)

[Frost and Sullivan Award](#)

[Wiki RuBee Summary](#)

[Tags on Steel Under Water](#)

[Tags on Forklift](#)

For more information

John K. Stevens

CEO Visible Assets, Inc.

john@rubees.com

617-395-7601