UNDERSTANDING RADIO FREQUENCY IDENTIFICATION:

THE CPB'S WHITE PAPER

"How would you like it if, for instance, one day you realized your underwear was reporting on your whereabouts?

California State Senator Debra Bowen, at a 2003 hearing

New York State Consumer Protection Board

Advocating for and Empowering NY Consumers

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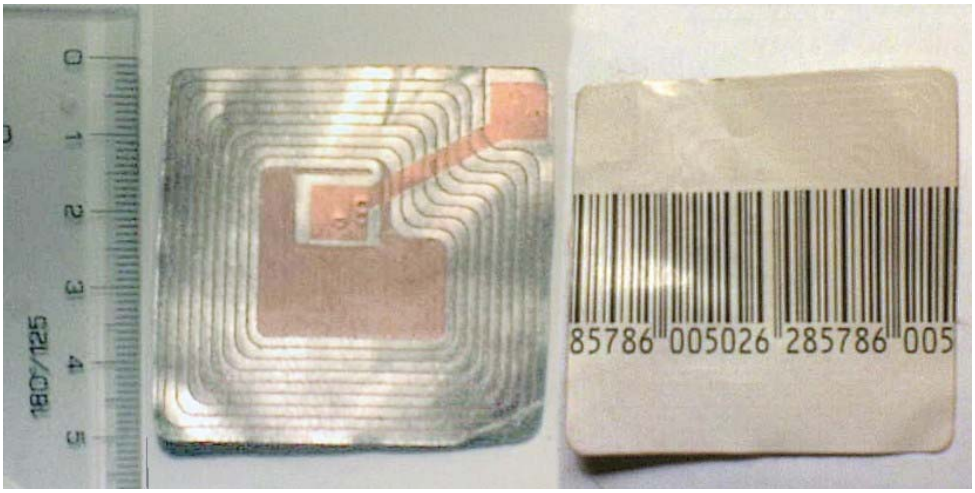

What You Need to Know About RFIDS

Whether it is in your library book, the toll plaza reader or store clothing tag, radio frequency identification technology is an increasing part of our daily lives. A greater understanding of this technology - what it is, how it works and the types of information that are transmitted - is important to being a smarter consumer.

WHAT ARE RFIDS?

Radio Frequency Identification (RFID) is a wireless technology used to identify items. RFIDs consist of:

- a tag containing a microchip and a radio antenna, and
- a reader.

The reader transmits the information to a computer system. The RFID tag is usually attached to an item (such as an article of clothing) or embedded into an item (such an employee's entrance pass). Radio signals from the chip send identifying information to the reader.

Some RFIDs use an Electronic Product Code (EPC), a unique number that identifies a specific item. While a Universal Product Code (UPC) can distinguish between a box of cereal and a carton of milk, an EPC can identify a specific box of cereal.

There are various types of RFID tags. Some tags are deemed passive because they do not have their own power source. The reader provides power to the tag through the radio signal it sends. The tag will then send back its information through the radio signal. Active tags, on the other hand, have a small battery or some other source of power, and therefore can send out their own signal. A third type of tag, called semi-passive, contains a small battery which runs the microchip but uses the reader's signal to transmit information. Generally, active tags can be read from the furthest distance.

A.

Photo Credit: Milo Grika, 2005

B. **With E-ZPass, paying tolls is convenient. Just use the E-ZPass Lanes. As you pass through the toll plaza, an antenna electronically reads account information on your E-ZPass tag. Your toll is electronically deducted from your prepaid account.**

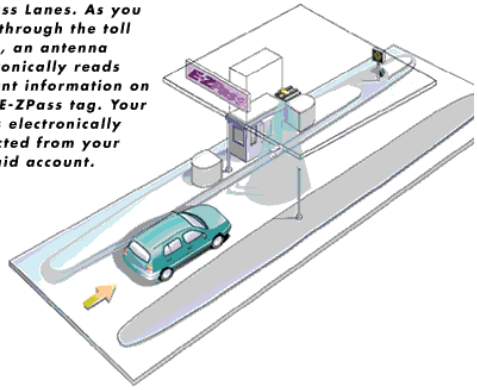

Photo Credit: Port Authority of NY and NJ

A selection of RFID tags and usage. Figure A: RFID tags used in libraries. Figure B: Diagram of how RFID technology works at EZ Pass Tolls

There are three types of signal frequencies - low, high, and ultra high - that RFIDs send. Low frequency RFID systems tend to be the least expensive, consume low energy, and penetrate non-metallic surfaces the best. In comparison, ultra high frequency RFID systems can be read from a further distance away and can transfer data faster.

Depending on the type of tag, the strength of the reader and frequency, transmissions can reach distances ranging from within a few inches to hundreds of yards away, or more.

WHAT DOES AN RFID LOOK LIKE?

RFID tags can be smaller than a grain of rice or larger than a deck of playing cards. Since they may be so small, you may not know that an item you own contains a RFID. The amount of information stored on a microchip also varies depending on the complexity and size of the microchip. The use of RFIDs may not be readily visible because the microchip is embedded into an item. For example, RFIDs are placed in tires to monitor their pressure.

Some items using tags with EPCs are labeled, usually on the back of the package, with a symbol containing the letters "EPC." This indicates that the manufacturer participates in a voluntary program to disclose the use of RFIDs, as well as to follow certain practices to protect consumer privacy. Currently, there is no State or federal requirement that RFID items have to be labeled or that retailers have to disclose that RFIDs are being used.

HOW IS IT USED?

- ***Inventory Control:*** RFIDs are use by manufacturers and retailers in the supply chain to control inventory. Retailers also use RFIDs to monitor the inventory levels on their store shelves. Many libraries also employ RFIDs in their books.

- ***Identification/Security:*** RFIDs are used in employees' pass cards, and U.S. Passports. Some pharmaceutical companies and pharmacies are using RFIDs to verify the authenticity of pharmaceuticals passing through the supply chain. Owners of livestock and household pets have been known to implant RFIDs into their animals for identification and tracking purposes. Implantable RFID tags have been approved by the FDA for use in humans. The implant could contain a person's entire medical history, which could be beneficial in an emergency.

- ***Payment for Goods/Services:*** RFID technology, such as the New York State E-Z Pass system, is used by motorists to save time at toll booths. Several large credit companies have introduced RFID-enabled "smart cards" which use the RFID technology at a store's register.

- ***Tracking:*** RFIDs have been used to track an item's movement within stores. This technology has also been used to track the movements of hospital patients, prisoners, and more controversially, schoolchildren. Additionally, RFID-enabled bracelets have been used to track Alzheimer's patients.

As RFID use becomes more widespread, it is important to know what information, if any, will be collected, how it will be used, if it will be stored and for how long, and whether it will be shared and with whom, especially if it is or can be linked to personal information about individuals.

CAN I DEACTIVATE RFIDS?

It depends. Embedded items cannot be deactivated without destroying the product to which they are attached. If the RFID in a car key were disabled, for instance, the car would not start. If a tag is attached to a product's packaging or to a piece of clothing, the tag could be destroyed or removed without damaging the product. However, before destroying or removing a tag, consumers should ask the retailer if removing the tag will prevent them from returning the item.

WHAT CAN WE DO?

Currently, there is no federal or State law prohibiting or regulating the use of RFIDs in consumer goods. There are several bills pending before the New York State Assembly and one in the State Senate that address the use of RFIDs. This legislation, if passed, would assist consumers in protecting their privacy rights by requiring merchants to disclose that they are using RFID technology on the items that they sell and to provide consumers the opportunity to destroy or disable the RFID tags after purchase.

Consumers should look for the tags and ask questions about RFID usage and deactivation.