All of us involved in the IC card business are seeing headlines identifying a quickening pace of developments in contactless cards. Contactless technology seems to be a particular focus of efforts in the U.S. financial payments industry, originally with magnetic stripe data applications like Visa PayWave, MasterCard PayPass and American Express ExpressPay, and now with movement to EMV applications. These applications range from proximity cards used in transit to NFC payments made from smartphone platforms.

Activity in the ANSI INCITS and ISO Standards organizations reflects this high level of industry development. These activities primarily center on:

- **High speed data communication**
- **Limited use proximity cards**
- **Extended proximity devices, including NFC**
- **Data anti-collision provisions**

An initiative that has generated a lot of discussion is a proposed amendment to ISO/IEC 14443 that defines the RF interface for very high-speed communication between the contactless IC card and the reader. Much work has ensued to characterize performance differences between amplitude shift (ASK) and phase shift (PSK) modulation. A demonstration of the technologies has indicated that ASK is more fully developed at this time. Thus, it appears that ASK will lead the implementation of this capability and PSK will be considered as it develops. Regardless which technology comes to dominate, it is apparent that an emphasis will be placed on higher speed communications between cards and devices. As EMV expands to encompass contactless cards, this will be a critical feature to ensure transaction times are reasonably short.

The limited use contactless (proximity) card has been used in transit applications for several years. INCITS 410 is the standard used worldwide to specify these limited use cards. Historically, these cards have a life of less than 6 months and a need has been defined to extend the life of these cards from 6 months to 1 year. This implies that the primary card carrier, predominately made of paper, will need to include plastic. Since the market for such cards today is 750 million annually, this could present a major new market opportunity for plastic card manufacturers.

Another initiative being discussed is that of a new class of devices...
called Extended Proximity Devices. The impetus for this seems to be coming from those involved with national ID programs, although applicability to financial payments and transit applications is obvious. The basic idea is that these card devices should be able to operate both as reader devices and as card object devices in those roles defined in ISO/IEC 14443. This also specifically applies to mobile devices (i.e. smartphones, NFC devices).

For example, a mobile phone sensing the presence of a 14443 compliant ticket machine will switch into card object mode, or vice versa, a mobile phone sensing the presence of a 14443 compliant contactless card will switch into reader mode. Also the mobile phone is desired to work as a reader when it should be connected with a 14443 compliant bankcard and thus is able to provide a secure connection between that bankcard via the mobile phone and via a mobile phone network to a remote bank application server. The latter use case is in principle also desired and applicable, e.g. for policemen, checking and verifying a 14443 compliant electronic ID card or drivers license against the stored and authenticated data in a remote government server. The overall intent here may be to devise a path for NFC interoperability.

Data anti-collision provisions deal with some of the practical aspects of working in a contactless environment. When you have a multitude of contactless cards in your wallet and enter the field of a contactless reader device, how does that reader device know which card to use? This is particularly applicable to applications like transit, where you only need to “wave” your wallet or purse near the reader. The current approach the Standards bodies are taking is to require such a conflict to be resolved by refusing all cards in the wallet, with the consumer required to select one card from their wallet/purse.

Similarly, too many cards held in the wallets/purses of too many consumers all entering the same reader device field (i.e. at a transit entry point) could collapse the reader field rendering all such cards inoperable. Solutions are being considered that will allow reliable use of contactless cards, providing predictable and acceptable behavior, when such conditions are experienced.

Standards for contactless cards are moving quickly on a number of issues as the industry rapidly moves towards implementation and deployment of contactless card systems. Many new and advanced technologies are being employed with cross-over between IC cards with contacts as well as NFC devices impacting the developing standards for these cards.