

Vincent Valdes: ITS Standards can facilitate the deployment of interoperable ITS systems, and make it easier to develop and deploy regionally integrated transportation systems. Transit standards have been developed by transit professionals like you at a national level to encourage competition and limit costs within our industry. However, these benefits can only be realized if you know how to write them into your specifications and test them. There are now a series of modules for public transportation providers that cover practical applications for promoting multi-modalism and interoperability in acquiring and testing standards-based ITS Transit systems.

Gary Yamamura: This module twelve, Electronic Fare Payment / Advanced Payment Systems: Open Payments Acceptance builds on the information provide in module ten last year which provided a high level overview of electronic fare payment systems or EFPS. This will focus on open payments acceptance, one of the three electronic fare payment system implementation methods discussed in module ten. Because open payments acceptance does not provide support for all types of passengers or for the full breath of agency fare policies it must be considered as one element of a more comprehensive electronic fare payment system. My name is Gary Yamamura. I'm a principal consultant at Three Point Consulting, Inc. and have sixteen years' experience as an owner and operator of management consulting firms. I also have fourteen years consulting experience in the public transportation industry with a focus on electronic fare payment systems and technologies. The learning objectives for this module twelve include the following. One, define the stakeholders, terminology, standards, specifications and regulations associated with the acceptance of open payments. Two, explain the three main options for implementing open payments acceptance and their impacts on agency operations and systems. And three analyze the benefits, risks and costs of open payments acceptance in support of the procurement and implementation of an open payments acceptance solution. Let's examine learning objective one in closer detail. I'd like focus beginning on the stakeholder's terminology standards specifications and regulations used in the open payments acceptance world. It's very important to understand and the roles and responsibilities of the key stakeholders and how they influence open payments systems implementations. There are numerous parties that play important roles in a system with open payments acceptance. This section will identify the key stakeholders and discuss in depth their primary roles and

responsibilities. The term open payments acceptance refers to the acceptance of open bank issued contactless debt, credit and prepaid debit cards or bankcards for payment affairs at transit points of entry. It should be understood that this term has had a variety of different definitions and interpretations since it was first used around 2006. This is the most commonly used definition today. Although many fare collection systems in the U.S. today can accept bankcards for the purpose of prepaid fare products such as passes or tickets only a few allow passengers to use bankcards to pay fares directly onboard buses, on trains or at fare gates and stations. The contactless bankcards can be traditional credit card sized pieces of plastic, or a mobile device that stores the card data or an electronic token of that data and transmits it via radio waves. On this slide you see a few of the key terms and abbreviations that are used specifically when implementing an open payment acceptance system. I'd like to explore just a few of these but if you'd like a complete glossary of all of the terms and abbreviations that are used in this industry please refer to the student supplement. The first of these terms is account based systems. The account based system is one of three different methodologies that was discussed in module ten electronic fare payment systems and is the predecessor to this module. Account based system specifically move the processing and calculation of fares to a backend system making the payment media albeit a smartcard ticket or a mobile device simply a token that provides access to the account which is stored in the backend system. Authentication refers to the electronic confirmation that a bankcard is genuine. Authorization is a process where the card issuer or a company acting on its behalf provides a formal approval to a merchant for a bankcard payment. And finally, merchant fees. Merchant fees is the collection of charges that merchants pay to accept bankcards for payment of goods and service. We'll explore each of these in more depth in the slides to follow. This chart illustrates the hierarchy of key stakeholders associated with open payments acceptance. These stakeholders include from top to bottom, the card networks, the issuers, the acquirers, the mobile payment system operators, independent sales organizations, the payment gateways, merchants, systems integrators and finally the cardholders. Let's explore each of these in a little more depth. The card networks which are sitting at the top of the hierarchy provide global brand recognition. They also establish and enforce the network operating rules, that is the regulations and specifications that all parties participating in an open payment system must follow. They provide a global network for transaction routing and support and promote the use of payment related standards and specifications. Examples of card networks include Visa, MasterCard, American Express and Discover. I should mention that the icon showing in the upper right hand corner of the slide is simply a

highlight of the hierarchy shown on the previous slide. It's intended to remind you where each of these different entities sits within that hierarchy. The card issuer or issuers have roles and responsibilities that include cardholder acquisition and servicing, card branding and distribution, account management, card authentication, cardholder verification, payment authorization of settlement, et cetera. Key examples of card issuers would include Citibank, Chase Bank, Bank of America, et cetera. Most importantly the card issuer owns responsibility for forming and servicing the cardholder relationship and then maintaining the accounts that are linked to the cards. Acquirers also perform a very important role within the system. They provide payment transaction processing on behalf of the merchants. They facilitate authorization of settlement processing and act as the interface to the card networks. They also process chargebacks and accept financial liability on behalf of the merchant. More recently, they are also saddled with the responsibility of enforcing the payment card industry data security standard also known as PCI or PCI DSS. We'll talk more about PCI in a slide that follows. Examples of the acquirers include First Data Corporation and TSYS. I should also mention that under Visa and MasterCard rules, acquirers must be banks. That is chartered financial institutions that operate under license from the card network. The independent sales organization, also known as ISO, provides a team for door to door sales on behalf an acquirer. It may also provide added value services such as enhanced reporting of customer software for point of sale terminals or loyalty systems, et cetera. However, the majority of these added value services will have little value to a transit agency that's implementing an open payment system at least based on the current services that are offered by ISOs. The ISOs assume the primary responsibility for merchant servicing that they act really as a reseller of traditional acquirer payment processing. I should also mention that the term ISO is used specifically within the bankcard payments industry or the open payments industry to refer to an independent sales organization. The term ISO is also used to refer to the International Standards Organization, an entity which we'll talk about later when we get into the international standards discussions. The payment gateways or payment gateway operators provide a processing system for bankcard payments. They act as an intermediary between the acquirer and the merchant somewhat like an ISO but actually providing real utility in the form of a processing platform. Most importantly the ISO's provide, in general, an open interface for its processing system to simplify and shorten the payment integration effort. They primarily focus their services on online or Web-based payments. Examples of payment gateways would include Authorize.net, PayPal and SecurePay. It's important to understand that payment gateways and ISOs, that is independent sales organizations

talked about on the slide previously, are optional parties to an open payments acceptance system. And in most payment systems for larger transit agencies or merchants they will not play a role. The mobile payment system operator is a fairly new entry to the open payments acceptance world. This entity develops and operates a mobile payment system. Great examples of mobile payment system operators would include Apple who operates the system now known as Apple Pay. And Google operating the system known as Android Pay and, of course, many others. The mobile payment system operator is responsible for recruiting issuers and enabling integration with their systems to promote the idea of having a virtual card that is stored within a mobile device. In almost all cases mobile payment system operators today operate what is known as a mobile wallet, meaning that you can have a variety of different card products all stored within your mobile phone and you can pick and choose which of those card products would apply to any particular payment that you're making. Also in all cases, mobile payment system operators are offering a mobile app, that is a native application that is downloaded to your phone to facilitate the mobile wallet and mobile capabilities. These entities facilitate virtual card accounts setup by cardholders and perform the front end cardholder authentications using things like biometrics, a thumbprint, or an iris scan to confirm the cardholder's identity to the device so that going forward that individual that owns the phone can identify themselves to the phone and therefore relieve the merchant of having to identify that cardholder. They also provide front end card data security, in particular in the form of tokenization. It's probably valuable to take a moment and talk about tokenization because it may play an important role in an open payment acceptance implementation. With tokenization the card information, in particular, the card number is replaced with another value. In almost all cases that value either by itself or coupled with other information which is unique to each transaction makes that information unusable for a second payment. And so if your card data is stolen from your mobile device because it is tokenized, someone cannot use that information to create a counterfeit card or even to perform an unauthorized transaction. The system integrator is also an important entity within an open payment acceptance system largely because most transit agencies simply do not have the technical expertise or personnel with capabilities to develop, design and install their own system for open payments acceptance. The system integrator, therefore, takes on the role of designing, developing, and installing an electronic fare payment system on behalf of the merchant in this case a transit agency. And establishes a backend connection to the acquirer system or potentially to an ISO or to a payment gateway. This entity ensures that equipment and software are compliant with all of these specifications and regulations that are critical to

meet the obligations associated with open payment acceptance. Examples of system integrators would include Cubic Transportation Systems Incorporated and Xerox. Perhaps the most important entity within an open payments acceptance system simply because largely the audience that's listening to this module will be within this group are the merchants or the transit agencies that want to implement or do implement an open payment acceptance solution. The roles and responsibilities of the merchant include acting as, and this is an official industry term, the merchant of record. The merchant of record accepts financial liability for all chargebacks and all payments that are processed through its system. It is also responsible for ensuring that its system and all aspects of its system both technological as well as operational have ongoing compliance with the various specifications and regulations and standards that are obligations for open payments acceptance. The merchant of record has also responsibility for disputing or accepting the chargebacks that is transactions or payments that are disputed the by cardholders as something that they did not authorize or something that is not appropriate because the services delivered were not as required. Examples of merchants of records that are using open payment systems today would include the Chicago Transit Authority and the Utah Transit Authority, two entities which we will discuss when we go through our examples at the end of this module. And finally, our cardholders. Arguably the most important entity within an open payments acceptance because without the cardholders there would be no open payments acceptance. The cardholder has the account ownership. They're the ones who carry the card or mobile device and are responsible for actually making it useful. The cardholder must voluntarily decide to use their contactless card or mobile device in an open payments acceptance system. And they are responsible also for adhering to the rules that are established by the issuer for card and account ownership. They must also, of course, adhere to the agency fare policies when using their card or mobile device within an open payments acceptance system. And, finally, again, they must voluntarily make fare payments using that card or mobile device. Now, let's switch gears and talk a little bit about the standards, specifications, regulations that are important to and essential to understand when you're implementing an open payments acceptance system. The first of these is standards. I'd like to define what standards are so that we have a clear understanding before we proceed to talk about them. Standards are documents that define the processes, procedures and/or technology for the common and repeated use of a system that has been established by consensus and approved by a recognized organization. I've got those words bolded on this screen to emphasize the fact that this is one of the key differences between standards and specifications and regulations.

International Standards, in particular, are formally approved and maintained by the International Standards Organization or ISO and/or the International Electrotechnical Commission (IEC). The key standards we will discuss in this module include the payment card industry data security standard or PCI DSS as mentioned previously. ISO/IEC 14443, ISO/IEC 8583 and finally ISO/IEC 18092. Again, we'll talk about these in more depth in a few moments. Let's contrast that definition of standards with a definition of specifications. Specifications are a detailed description of the performance requirements, dimensions materials and interfaces for the development and use of a technology or a process. Most importantly specifications are typically defined and maintained by a private party that offers that technology or process and it can be changed at any time. Key examples of specifications that will be discussed in this module include EMV, also known as Europay, MasterCard, Visa; Visa payWave; MasterCard PayPass; American Express ExpressPay and Discover ZIP. This particular diagram is provided to identify the components of an electronic fare payment system that are impacted by standards in the green boxes, specifications in the red boxes and regulations in the blue boxes. You'll see these same boxes on each of the slides that follow to help remind you what type of document we are reviewing. You can summarize this diagram by noting that the bulk of the standards and specifications address only the front end of an electronic fare payment system while regulations deal primarily with the backend or central system. Two; that is EMV and PCI DSS may have impacts on all components of the system although the scope of impact of the EMV specification, in particular, will depend on the choices that are made by the card issuers. We'll explore each of these in greater depth in the slides that follow. Let's begin with a study of the payment card industry data security standard, again, PCI DSS. This is probably one of the most well-known of the standards simply because there have been so many data breaches recently PCI DSS has become a common household term. This standard defines bankcard data security rules. That is the rules for protecting bankcard data is being processed, when it is being captured and when it is being stored. Adherence is mandated for all merchants that accept cards for payment. And it is maintained and enforced by the PCI Security Council who passes on the responsibility for enforcement to the card networks who, in turn, pass it on to their acquirers. The card networks originally develop their own proprietary standards for the protection of their card data. It became evident after numerous breaches of data that it was beneficial to the financial services industry to consolidate these rules into a single standard giving birth to PCI. This standard now includes several different documents that define guidelines and rules for the protection of card data in both physical and electronic forms while being processed and

in storage. There are ongoing efforts at the state and federal levels to pass laws requiring PCI compliance by all parties that touch card data. However, to the best of my knowledge, none of these efforts has actually resulted in a law being passed. Second, at least in familiarity to the PSI standard, is what's known as the ISO/IEC 14443 standard. That is the contactless integrated circuit cards, proximity card standard. This standard has been widely adopted for short range communications between cards or mobile devices and readers. It applies to cards that are both physical as well as virtual and incorporates all of the leading contactless bankcard specifications. Additionally, this is the same standard that is used by contactless bankcards as well as the leading mobile payment systems, such as Apple Pay, Android Pay and Samsung Pay. Next in the international standards group is the ISO/IEC 8583 also known as financial transaction card, originated messages, interchange message specifications. As implied by that name this particular standard defines the format and content of electronic bankcard transaction messages. That is how messages are formed, and are transmitted from the merchant through the acquirer to the card networks and on to the issuer and back again. The third international standard is the ISO/IEC 18092 the long name, Information Technology, Telecommunications and Information Exchange between Systems Near Field Communication, Interface and Protocol. It is that particular phrasing, near field communication which makes this particular standard one of the most well-known although few would know the ISO/IEC 18092 reference, simply because near field communications is commonly abbreviated as NFC. This particular standard defines methods to enable short range communications particularly between mobile phones and devices known as readers. It incorporates the ISO/IEC 14443 communication protocols basically grandfathering them into the overall standard of NFC. It also has a sister standard reference ISO/IEC 21481 and together they form the NFC standards. Nearly all or at least many mobile devices today, in particular, smartphones have NFC technology built into them. Another well-known international specification is EMV. Originally, this stood for Europay, MasterCard, Visa specifications, the three organizations that originally developed the standard. Europay has since been absorbed by MasterCard and so it no longer exists as an entity. And accordingly EMV no longer has the longer name and it's referenced only by its abbreviation. This well-known abbreviation refers to the specifications for chip-based bankcards and merchant payment terminals and systems that accept chip-based bankcards for payment. EMV has been widely implemented in Europe, Asia, Latin America, and in Canada. It includes requirements for both contact and more recently contactless cards. And began a U.S. implementation in about 2011. Another specification or set of

specifications are the card network contactless card specifications. These established requirements for contactless bankcards, equipment and transactions. There is a unique specification for each of the card networks. Remembering the card networks, our examples include Visa, MasterCard, American Express and Discover. Each of the leading card networks has its own program and its own program name. As mentioned previously those include the Visa payWave program, the MasterCard PayPass program, the American Express ExpressPay program and finally the Discover ZIP program. Although often mistakenly referenced as standards, these specifications are, in fact, unique to each card network and can be changed at any time based on the rules and shifting desires of the card network. Accordingly, they can be changed with little advanced notice. However, in order to participate in an open payments acceptance system merchants must comply. And therefore any change may require an actual change to the system or the software running in that system and would be done so at the merchant's expense. It's also important to understand that each of these specifications has been modified to support a mobile or virtual card implementation. The card network operating rules are really neither specifications or standards but they fall generally into the category of specifications. These, of course, define rules for the acceptance of cards and mobile payments linked to cards. There are unique set of rules for each network. And they're updated, usually, semiannually. Again, not true specifications per se but they fall in the general category of specifications. Now, let's shift gears and talk about regulations. In the U.S. there are various federal regulations that impact acceptance of bankcard transactions. These include the Electronic Funds Transfer Act; the Debit Card Interchange Fees and Routing Act; and The Fair and Accurate Credit Transactions Act. Regulation E, the Electronic Funds Transfer Act. Regulation E protects the individual consumers engaging in electronic funds transfer. It defines requirements for receipts, periodic statements and procedures for resolving mistakes or errors. It creates definitions for gift and reloadable cards as well thanks to some recent enactments by Congress. And it established rules for assessing fees, the expirations of funds and the need for distinct cardholder disclosures associated with gift and reloadable cards as well as other forms of payments. For transit agencies, the primary concern is to provide receipts to passengers that are in compliance with the electronic funds transfer act although these can actually be made available on demand and don't have to be issued with each open payment acceptance transaction. If the agency elects to issue a cobranded, for example, prepaid debit card other portions of the regulation may apply. Our next regulation is Regulation II, also known as the Debit Card Interchange Fees and Routing Act. This is embodiment of the Durbin Amendment. The

Durbin Amendment was actually a last minute amendment made to what is more largely known as the Dodd Frank Wall Street Reform Act of 2010. The Durbin Amendment initiated by Senator Durbin required two distinct changes to the way that debit cards of any type were charged to merchants. And how they were offered in terms of transaction processing. Specifically, the Durbin Amendment or Regulation II limits interchange fees for regulated banks to 0.5 percent of the payment amount plus 21 cents per transaction, plus one additional penny if the issuer meets certain requirements for security. It prohibits exclusive agreements for transaction routing and processing. Prior to the Durbin Amendment, it was perfectly legal for a bank to issue a card that could only be processed by one entity. As a result, that one entity if they received a dominant share of the market and some did were able to charge pretty much whatever they would like to with little opportunity for the merchants to disagree. The Durbin Amendment allows the merchant to pick a couple of different ways to route transactions and requires that debit card issuers allow transaction routing with at least two different networks so that the merchants will have a choice and introduce competition for pricing. It exempts issuers with less than \$10 billion in total assets. However, the vast majority of debit cards and prepaid debit cards issued within the United States would be non-exempt. That is issued by entities with more than \$50 billion in assets. And finally, Regulation V the Fair and Accurate Transaction Act. This act only has an impact because it requires the truncation of card numbers and prohibits the inclusion of card expiration dates on transaction receipts or really whenever a card number is presented to a cardholder or the merchant. The bottom line is you cannot present an entire card number and particularly a card number with an expiration date on any forms, on any online screens, on websites, et cetera. Now, let's go into one of our activities. The question for you to consider is, which of the following is not a key stakeholder for an electronic fare payment system that accepts open payments? Your answer choices include A, issuers. B, card networks. C, point of sale terminal manufacturers. And D, cardholders. Now, let's review the answers. The correct answer is C, POS terminal manufacturers. This is correct. Although the point of sale terminal manufacturer makes equipment for open payments processing, this equipment can be supplied by a variety of different providers. Choice A- issuer is not correct. The issuer provides cards and card accounts for use in electronic fare payment system that accepts open payments and therefore is a key stakeholder. Choice B, card network is also incorrect. The card networks provide a global platform that facilitate open payments and therefore they are also a key stakeholder. And finally, D, cardholder. This is also incorrect because cardholders carry and use contactless bankcards in an electronic fare payment system that accepts open

payments. And they voluntarily use that open payments acceptance capability to make fare payments on board vehicles and in stations. Now, let's move to learning objective two, the options for implementing open payments acceptance. There are a variety of common benefits associated with implementation of open payments acceptance. Example one would include the elimination of the need for passengers to one, obtain agency issued fare media. Two, buy fare product. Three, understand fares or the details of the agency's fare policy. Four, carry exact change. Five, register in advance. And six, create an account. If you listened to last year's module ten on electronic fare payments systems, you'll understand that in any electronic fare payment system these are all important roles taken on largely by the issuer in providing services to passengers that use an electronic fare payment system. One of the key advantages or one of the set of key advantages offered by open payments acceptance is that will reduce or eliminate these responsibilities for the transit agency and ultimately for the passengers that use those systems. Another common benefit is it reduces the agency's need for fare media itself. In any other form of electronic fare payment system, the transit agency must provide the media that passengers use to ride their system, whether that media be in the form of a magnetic ticket, a contactless smart card or some other device the agency must provide it and must provide a mechanism or a network to distribute that media to passengers. In an open payments acceptance system, that media is distributed, instead, by the issuers. And therefore, relieving the agency of that responsibility. In addition, once the passenger has fare media in any other form of electronic payment system there must be an entire network set up for passengers to buy fare products, that is passes or tickets that can be used with the fare media to actually ride the system and pay fares. Typical sales networks would include ticket vending machines, a passenger website, various mobile apps that the passenger could download as well as a fleet of retail stores that would sell cards and offer passes for sale. Again, largely within an open payments acceptance solution these needs are greatly reduced or eliminated. Yet, another set of common benefits would include the transfer of responsibilities to the card issuer. We've already talked about some of those but let's talk about them in more depth. First is the card distribution and statements. As we've already learned the issuer has responsibility of acquiring the customer and getting the passenger a card or a mobile app to actually be able to use within an open payments acceptance system. The issuer also takes on responsibility for issuing statements to the cardholder and making statements available both online as well as in paper form. The issuer must also take responsibility for providing a call center in dealing with issues over the phone with passengers relating to fare payments. Of course, any time the cardholder disputes a payment the

issuer must take responsibility for handling that dispute and reissuing that back to the card networks and ultimately to the acquirers for distribution down to merchants that originally accepted the payment. And, of course, the issuer must take on ongoing responsibility for managing the account which would include not only issuing the card but replacing the card if it's lost or stolen, and of course, replacing the card once it expires. Along with the benefits of open payments acceptance there are a variety of different issues that must be accepted by any merchant or transit agency that implements an open payment acceptance system. The first of these is most commonly known as the first tap risk. Now, this is based on the philosophy that it is not feasible to provide a real time authorization and authentication of the card. The reason for this is because authentication and authorization of cards take place in the backend system today. That is in a typical merchant, once a card is swiped or inserted into the terminal the information off of that card is captured and then sent through the acquirer on to the card network and ultimately to the issuer to process. The issuer applies various electronic rules to determine if the card is genuine and to determine that the account is valid before authorizing the transaction and sending a transmission back down that chain ultimately to the merchant terminal to approve the transaction or to deny it. That process typically takes anywhere from two to thirty seconds. In a typical transit agency, we can't wait two to thirty seconds for the transaction to be approved simply because it would cause long lines for boarding buses or getting through gates, et cetera. Accordingly, typical implementations of open payments acceptance assume that the transaction will be performed offline. That is there will be no attempt to contact the issuer in real time. As a result, every card must be approved the first time offline. Since we haven't ever seen this card before we can't know whether it's good or not. We can't know if it's counterfeit or not. And we can't know if the account is in a situation that will allow the transaction to be approved, or even if there's enough credit available to pay for the fare payment. Once a card has been approved the first time we can know that we can accept it the following times with minimal risk. However, if the card is not approved and we would not know that until after the passenger has taken their ride, we would then need to add a bad or negative list this particular card. Negative lists are typically stored within the payment terminal so that the next time the card would show up it would be denied. Some mitigation strategies that a merchant or a transit agency might employ to reduce the risk associated with first tap would be to offer a real time issuer authentication and authorization process. As mentioned previously, however, this may take anywhere from two to thirty seconds. For a system with fairly low ridership and minimal opportunities for customers backing up at a bus door, or at a station fare gate, this would be an acceptable solution. Another

opportunity would be to-- I should say, I'm sorry, if you implement such a solution, of course, you have to accept the fact that transactions will take a few more seconds to process. Another issue associated with open payment acceptance are merchant fees. And this is a critical one to keep in mind and one that is in many cases ignored by transit agencies that are considering an open payment acceptance solution. Merchant fees could account for ten percent or more of the fare amount. It's important to understand that in a typical open payment acceptance system fares are charged at the full fare price. For instance, if your typical fare is \$2 to ride a bus, then \$2 would be charged to the card at the time that the passenger boards. When we're talking about merchant fees there's a variety of different fees that are employed to combine and come together that are known as merchant fees. Again, the total of these fees can easily equate to ten percent or more of the fare depending on what your fare amount is. So strategies to mitigate this impact of fees would include transaction aggregation. This is simply the process of holding on to multiple transactions, bundling together, and then sending them together as a single authorization and settlement request in order to reduce your costs. We'll talk more about those costs in slides that follow. The third shared issue I'd like to talk about today would be the minimal security for offline payments that are offered within the current crop of open payment solutions. Remember, I said earlier, that in an open payment acceptance system the transactions will be approved offline. In doing so, we completely bypassed almost all of the card authentication and transaction authorization processes because those processes are done online by the issuer in a typical merchant situation. One mitigation strategy that might be employed to mitigate this risk would be to implement a real time issuer authorization as mentioned previously. However, as we've talked about this could easily increase the transaction time to two or five or even more seconds. And would not be viable for a heavily used system. Another shared issue associated with open acceptance is the lack of cardholder adoption. This is a critical concern and one that's been very impactful within the U.S. transit industry. Due to security concerns on the part of the cardholder, due to insufficient cardholder bankcard issuance, and simply because some passengers simply do not have a contactless bankcard or a bankcard of any form there's a lack of cardholder use of open payment acceptance systems. We'll talk more about this a little bit later, but one great example of this is Washington D.C. Washington D.C., the transit agency there known as WMATA recently procured a system that was designed around the concept that all passengers would be using an open payment system card or that is a contactless bankcard or a mobile wallet to make fare payments both at their fare gates as well as on board their buses. After spending more than \$35 million on their transit integrator the

agency ran a pilot program inviting a number of different passengers to participate in a six-month pilot to test out how the system would be accepted and used. Unfortunately, the majority of the people who had signed up for the pilot were unable to participate simply because they did not have a contactless bankcard or could not qualify for one. Or did not have the right type of handset to be able to use a mobile wallet. As a result, very, very few people were able to use this system at least in the agency's mind. Insufficient numbers used the system. And the agency ultimately cancelled the contract and decided to go in an entirely different direction after spending years going through the procurement process. Yet another shared issue would be the cost of compliance. As mentioned previously there are numerous regulations, specifications and standards that must be adhered to continuously if you're going to operate an open payments acceptance system. There are different applications for each of the card networks as one example. And, of course, in particular, in the case of specifications they can change and change with little notice and change regularly. The cost of maintaining compliance with the specifications, regulations and standards, of course, is born by the transit agency. I can't really think of a good mitigation strategy for this because I believe these costs are unavoidable. Next on the list of shared issues would be that there are few systems and revenue service. This simple means that most vendors that would offer an automatic fare collection system or electronic fare payment system lack experience in implementing open payments acceptance. Additionally, very few vendors are making equipment that are certified for use in open payments acceptance systems. As one key example of certification EMV compliance requires that all of the devices and the entire system go through a rather rigid certification process. The certification process today can take anywhere from ten to twelve months to go through although changes are being made to try to improve that timeframe. Once again, I cannot think of a reasonable mitigation strategy to avoid this. Without further adoption, revenue service systems and proven vendors will be minimal and therefore your choices will be few for the near term. One of the last few issues I'd like to discuss that are shared among all entities that implement open payments acceptance would include the long certification queues which I mentioned previously. One of the ways to mitigate this particular issue is simply to request the certification application early, at least as early as possible. And to get into the line sooner so that you can get through the line faster. I should mention, however, that if you make any significant changes to your software and in particular to your hardware a new certification may be required. And finally, on the list of shared issues would be the impacts to Title VI. Those of you in the transit industry, of course, you're aware that Title VI prohibits any actions on the part of the

agency that might hint at being favorable or dis-favorable to disadvantaged groups. For most open payments assistance acceptance systems, of course, the passenger must qualify for a bankcard in order to participate in that open payments acceptance system. Since policies cannot favor open payments in price or in convenience it's important to offer an alternative to passengers who can't qualify for a bankcard. One of the mitigation strategies, of course, is to ensure that unbanked passengers have equally convenient and equally priced options for fare payment even though they may or may not be able to use the open payments acceptance solution. What I'd like to do for the next few slides is talk about the three different ways that you can implement open payments acceptance. The first and simplest of the methodologies is known as Pay As You Go or PAYG. In a PAYG implementation the concept is for passengers to pay fares with each tap of a contactless bankcard. The fare policy associated with this particular implementation methodology is very simple, all transactions are charged at whatever full fare is. In the example I gave previously the fare for a full fare ride on board a bus or train was \$2. What this would mean in this particular PAYG implementation is that every transaction initiated by a contactless bankcard or a virtual card in a mobile wallet would simply be assessed at \$2. The processing of the transactions is very simple, therefore. The fare is approved locally by the reader, remember that's done offline and then sent later in batches to the acquirer. There are a couple of different options that we can implement here, one would be payment aggregation as talked about earlier. That is simply bundling multiple transactions together and sending them as a single transaction to the acquirer and to the issuer for approval and authorization. And this is done to help reduce merchant fees. Another option that agencies might consider if going with a PAYG approach is to issue a cobranded prepaid debit card to unbanked passengers in order to avoid impacts associated with Title VI. The PAYG model offers some unique attributes. On the positive side, those shown in the green circles, it is a less complex platform to implement, that is when compared to other open payment methodologies. It will also have the potential for increasing fare revenue when all fares are charged at the full fare which is almost always the highest fare that could be paid by a passenger, obviously there's an opportunity to increase the amount of money collected. And for the passenger, of course, it's very easy to use. If you've got a contactless bankcard or a virtual card in a mobile wallet all you have to do is walk up to the gate, or get on board the bus, present your card or mobile wallet to the reader and the transaction is approved at whatever the normal full fare is. On the negative side, those shown in the red circles, you can see that the first of these is that it will maximize the merchant fees paid by the transit agency. We'll talk more about that in the slides that follow. And also

for the passenger will ensure that the passenger will always pay the highest fare. And, of course, every ride incurs the fare. As most transit agencies are well aware most have some form of a free or discounted transfer policy. That is in order to get from point A to point C passengers may often have to travel first to point B and then get on a second bus to go from B to C. That second bus or second train would be known as a transfer and often rather than having to pay full fare again, the passenger would pay a discounted fare or potentially would pay nothing for that second ride. However, in an open system that second ride must be charged at full fare because all fares have to be assessed as the full fare rate. Now, let's look at another methodology. This particular one includes the PAYG features but includes another feature known as fare capping. In a fare capping model, the core concept is also fairly simple. Passenger pays fares with each tap of a bankcard. But the total amount paid by the passenger either on a daily, weekly or monthly basis is capped at a particular amount. The capping is usually done at the same amount as a pass for that same period of time. The fare policy can be stated that the passenger will always pay, industry term, the "fairest fare". The fare is approved locally by the reader. Amounts are then calculated by the central system and then sent on to the acquirer after determining whether or not the passenger has met the cap for the day, week or month. The options for implementation are the same as those for the PAYG methodology. Now, let's look at the advantages and disadvantages associated with this particular model. Once again, the advantages are shown in green circles. On the positive side it will reduce merchant fees, again, when compared to other open payment methodologies. It's also very easy for the passenger to use. Passengers don't need to understand what the fare policy is. All they need to know is they're always going to pay the fairest fare. On the negative side it has the potential for having the opposite effect that the PAYG model has, that is it may actually reduce fare revenue since all passengers would never pay that are using the open payment system anyway would never pay a higher amount. They will always pay the minimal amount that is possible for the particular time period that they're paying fares in. It will, of course, add complexity to the design of the platform and, of course, ultimately to its operations. Just like the PAYG model there are no special fare programs or discounts. There's no possibility to consider transfers and other aspects of the program that would be typical for a broader electronic fare payment system. Let's look at finally a third model which is combining a PAYG model with a broader account based system. The core concept here is that passengers can pay fares with the tap of a bankcard. Or as an alternative they can link their bankcard to a transit account and buy and use prepaid fare products. The fare policy would be that PAYG, that is for each tap of the card you pay a

fare. Or if the passenger has opted for the second alternative they would be buying prepaid fare products and would have the advantage of having the lower or reduced fares associated with transfers and fare discounts. The process is similar to PAYG when PAYG transactions are performed. However, when the passenger is using an account the prepaid fares are calculated and then approved by a central system and assessed against the prepaid fare products purchased by the passenger. The options for implementation are the same as those associated with PAYG and PAYG with fare capping. The attributes associated with this methodology also, once again, include both positive and negative aspects. The positive one shown in green include that this supports current fare policy. That is most transit agencies today offer a variety of different passes and transfer rules to provide discounts to passengers that ride frequently. With this particular model, if the passenger opts to create an account and purchase prepaid fares he or she can take advantage of the variety of different discounts that are already offered by the agency. This will also serve a higher percentage of riders because now passengers who ride frequently, those, in particular, who would not want to pay full fare every time would be able to have an option that will allow them to ride at a discount and yet still use their contactless bank card or their mobile wallet to make payments. And, of course, because of this it provides more options for passengers in the terms of discounts and passes and, of course, reduced or free transfers. On the negative side it is the highest complexity for the platform and for the platform design in comparison to the other methodologies. It will require a network for fare product sales thereby eliminating one of the key benefits associated with other forms of open payment acceptance systems because now you have to be able to sell those prepaid fare products even to passengers using contactless bankcards and mobile payments-- excuse me, mobile wallets for fare payments. For the passengers, of course, you must create an account in order to receive those fare discounts. And it becomes a more complex system to use as a result. Comparing the three different models for complexity, of course, the PAYG only model offers the lowest complexity. PAYG and fare capping are the easiest to use for the passenger and honestly the easiest to implement for the agency as well by comparison to the third option. As far as fares are concerned for the passenger, the fairest of all is, of course, the PAYG with fare capping because the passenger will always be charged the lowest amount for the period of time that he or she uses the system. As far as merchant fees are concerned, the option which offers the lowest cost of the transit agencies in terms of fees would be the PAYG with fare capping approach. As far as revenues are concerned, there's a potential for higher revenues associated with the PAYG only model. They would be reduced potentially with the fare capping model and there would

be very little impact associated with revenue with the PAYG with account based system approach. And for passengers, of course, the solution is the same for all of them. It really incorporates only those that can qualify for a bankcard unless the agency opts to issue some form of bankcard to passengers, in particular, some form of prepaid debit card or transit benefits prepaid debit card or little or no credit qualifications are required. Let's go to our second activity. The question is, which of these open payments acceptance methods enables passengers to purchase and use prepaid fare products? The answer choices include A, Pay As You Go. B, Pay As You Go plus fare capping. Or C, Pay As You Go plus an account-based solution. Now, let's review those answers. C, pay as you go plus account based solution is the correct answer. Using this implementation method, passengers may elect to create a virtual account that is linked to a particular contactless bankcard. The passenger can then add stored value and/or a pass product to that account to pay fares. Choice A pay as you go is incorrect. Using the basic pay as you go method passengers are only able to make full fare payments using their contactless bankcard and cannot take advantage of any of the discounts that are offered for prepaid fare products or transfers, et cetera, that are offered by the agency. Choice B, pay as you go plus fare capping is also incorrect. Like the basic PAYG method passengers are only able to make full fare payments using their contactless bankcard. Although those fare payments may be capped, the electronic fare payment system will track those payments, predetermine the maximum dollar amount that has been reached and subsequent fares using the same gate within the same period of time would then be waived. However, no discounts are possible beyond that. Let's move on to our third and final learning objective, the benefits, risks and costs of open payments acceptance. And we've already talked a little bit about the benefits. Let's go into more depth on a few of those. One I mentioned, in particular, on the risk side is the understanding and assessing the costs of merchant fees. There are three different types of fees that are assessed for entities or merchants that allow open payments acceptance. The first and largest of these is known as interchange. This is a fee that is set by the card networks and is paid to the card issuer any time a card is accepted for fare payment. The second of these is known as card network assessments. These are fees paid to Visa, MasterCard, et cetera, for operation of that global network for acceptance. And the third is known as acquirer fees. These are fees charged by the acquirer or the payment gateway or the ISO for providing the services to the merchant. The fees almost always include two different types of components. The first of these are fixed fees. Very simply a few cents per transaction charged to the merchant. The second of these is variable fees. These are a percentage of the dollar amount of the payment being accepted.

Interchange in particular can be rather onerous and makes up about 85 percent of the total merchant fees that are assessed to any merchant or transit agency that is implemented in open payments acceptance system. Interchange will vary by the card network. It will vary by the type of card and product accepted, product meaning whether it's a gold card or a platinum card or a rewards card. And will also vary by the payment amount itself. In some cases, it's possible to get discounts on interchange for large volumes of transactions as one example. It's also important to understand that the fixed fees, in particular, can be burdensome to a transit agency that has implemented an open payments acceptance system because the dollar amount of the transactions are very low. Because the dollar amount of the transactions are very low a percentage or variable rate has minimal impact. However, the fixed cost, which I mentioned previously, can be anywhere from ten cents to thirty cents per transaction can easily equate to up to thirty percent of the fares for transactions below \$2. If, for example, you have a \$1 typical full fare and 30 cents in fixed costs are assessed against that transaction plus the variable rates, you can see that that 30 cents alone is going to be 30 percent of your \$1 fare. I should mention that there's another type of network assessment, in particular, charged by the Visa network called a Fixed Acquirer Network Fee or FANF. This monthly fee can be up to \$85 per payment location and it's regardless of the volume of transactions processed. If we delve into the fees in a little more depth, we can see that the typical fee calculation shown on this particular slide. In this particular example, we are looking at a transaction for a \$2 fare. The fixed fees for interchange would include four cents. This, I should mention, is based on the Visa interchange rates as of October 2015. The variable rate would be 1.65 percent for a total of 7 cents in interchange. The network assessments would include a little over 2 cents per transaction plus 0.13 percent or about 3 cents of the transaction. By the way, in almost all cases, transaction fees are rounded up to the nearest penny. And finally, the acquirer fees can add 5 cents or more to the transaction plus probably another 0.2 percent on average or about 6 cents to the total merchant fee costs. That equates to 16 cents in total merchant fees or 8 percent of that \$2 fare. I didn't mention it at the beginning but that fee calculation as you can see in the heading of that table is for credit cards. Now, let's look what happens with that fee calculation when a debit card is used. And remember, that debit card fee assessments, in particular, interchange are set or limited by the Durbin Amendment also known as Regulation II. Interchange on that transaction if the issuer has met the security requirements, would be 22 cents in fixed costs. The variable costs would be 0.5 percent, for a total of 23 cents in interchange costs alone. Assessments without the same three cents the acquirer would add the

same six cents. Total cost of 32 cents on a \$2 transaction or 16 percent of the total fares collected. As in the case previously, this example uses-- these are interchange rates as of October 2015 for small ticket transactions. Because of the high cost of merchant fees, I should say the relatively high cost of merchant fees, aggregation is an important consideration. Aggregation, as I mentioned previously, is simply combining two or more payments together and sending them to the acquirer as a single transaction in order to reduce, in particular, the fixed fee cost, since the variable costs would not be impacted by aggregation. Unfortunately, implementation and aggregation may increase the financial risk to the merchant. The reason for this is because you're asking for an authorization until after two or more payments have been received. This delay is the timeframe for implementation or I should say for collection of the transactions and as a result, you may not be aware that the passenger is riding on a card that may be stolen, counterfeit or simply not have enough credit available to pay the transaction fares. Some networks offer specific rules to help mitigate this risk, in particular, MasterCard, has a special program that allows you to do a single authorization upfront, aggregate the transactions for a number of days. And to combine them together for up to, I believe, \$14 in total transactions without the risk of chargeback. It will, of course, add complexity to the central system design. And it may increase the potential for cardholder disputes. Passengers may recognize 5 \$2-transactions because they rode 5 times in particular period of time. They may not recognize a \$10 transaction and accordingly may dispute that transaction since they did not recall having made 5 separate rides for \$2 each.

Let's move on to another set of risks associated with open payments acceptance implementation. That risk would be that there are insufficient products in market. I mentioned this previously that there are few issuers offering contactless smart cards today. And unfortunately, less than twenty percent of the smartphones that have been issued in the United States are eligible to even accept a mobile wallet. And considerably less of the owners of those smartphone have actually downloaded a wallet and are using them on a regular basis. In fact, the current estimates are something less than five percent of those with eligible smartphones are actually using their mobile wallets on any kind of regular basis. Although, both of these may increase over time currently it means that something less than five percent of your passenger base might be even interested in or could even potentially use an open payments acceptance solution today. Additionally,

passengers have expressed through a variety of different surveys, et cetera, that they are concerned about the security associated with any form of contactless payments and would prefer not to use that. And, of course, some passengers simply may not want to pull out a card out of their wallet, in particular, a credit card out of their wallet to facilitate a payment on board a bus or in a busy train station. Additionally, the agency must understand that it has a significant risk of a data breach, not that breaches are necessarily common but having a large number of transactions being processed, meaning that you've got large volumes of bankcard data in your system at any given time would certainly make the agency a candidate to be targeted for a data breach. And data breaches can be both costly and embarrassing to the agency. To other risks associated with open payments acceptance would include fraud. I've already mentioned the first tap risk which, of course, can be extended beyond the first tap if aggregation is employed or if negative list updates are not frequently set to all of the end devices. But there's also a risk associated with the counterfeits and lost/stolen cards. Cards can be difficult to counterfeit but if it is feasible for someone to do they could perceivably use the system almost indefinitely. Although, adding them to the negative list would prevent the use of the same counterfeit over again, it is certainly possible for someone to create a counterfeit to change the data associated with that counterfeit and therefore avoid the negative list the second or third time. And finally, we have the risk in the category of fraud as something known as friendly fraud and that is simply the cardholder, the authorized cardholder participating in transactions or lending their card to other people to perform transactions and then simply disputing the fact that they ever used the card in the system. There are also costs associated with implementing and operating an open payments acceptance system. We've already discussed merchant fees so I won't go back into that in much depth. But there are, of course, costs of compliance with the various regulations, specifications and standards associated with open payments acceptance. And, of course, there's the risk of chargebacks. Chargebacks not only have the risk of having the full amount of the fare charged back to the agency but there are almost always chargeback fees assessed by the acquirer for the need for them to actually process the chargeback and get it back to the merchant. In many cases, the chargeback fee can be several times the cost of the fare. And so a single chargeback fee can easily wipe out the benefits associated with multiple fare payments received in particular in the PAYG and the PAYG with fare capping models. Now, let's review some mitigation practices that might be valuable for the agency to employ or at least consider when implementing an open payments acceptance system. We've already talked about transaction aggregation. As I mentioned

previously, MasterCard, in particular, has those special rules to facilitate and support and encourage transaction aggregation without any special risks being incurred on part of the transit agency. Visa also has some special rules facilitating transaction aggregation. However, they do not offer within that program any special protections for the agency. American Express and Discover do not offer any type of special programs or special fees associated with aggregation. Another best practice would be the employment of a negative list. As mentioned previously, the current base model for open payments acceptance is to process all transactions offline. As a result, the negative list stored within the local device that is onboard the bus reader or within the train station fare gate, et cetera would be very important because it will have a list of all of the bankcards that have been previously used and have been denied for whatever reason or have been reported as lost or stolen or have been suspected counterfeits. This negative list should be frequently updated, ideally updated in real time or in near real time so that when transactions are denied by the acquirer that card or cards can be implemented or added to the negative list quickly. And therefore prevent additional losses on the part of the agency. Another potential implementation strategy would be to allow third party access to your negative list. When working on a particular project I was actually approached by some of the major card networks who were asking for that third party access simply because their issuers needed to know if a card was on the negative list to be able to remove it, once whatever the problem was had been resolved. Or to be adding cards to the list when, for instance, the cardholder called in to report that their card was lost or stolen and the issuer recognized that the card was being regularly used in an open payments acceptance system. Another best practice to consider to mitigate some of the risks would be to have a compliance team. That is a dedicated team that fully understands and has expertise in all of the regulations, specifications and standards associated with open payments acceptance. And, in particular, would monitor EMVCO. That's the entity that maintains the EMV standard as well as all of the bulletins issued by the card networks that announce changes to those specifications. The compliance team would be made up of experts or use the services of experts such as consultants who understand all of the various specifications and regulations. And understand what the best practices are for maintaining compliance with those standard specifications and regulations. And as I mentioned previously to tokenize the bankcard data. Tokenization, just as a reminder, is the replacement of the card number, in particular, with a number that can only be used once or that has no direct correlation with the original bankcard number. By tokenizing bankcard data if the data is ultimately stolen you mitigate your risk associated with the data breach. That is that data would be unusable to a third party to

facilitate other fraudulent transactions. Establishing a fare policy associated with open payments acceptance is also an important consideration and should be done during or before the procurement process. That is to define your objectives for what you want to get out of an open payments acceptance system. And then determine what the best method and options are for implementing that in terms of fare policy. As an example, if the objective is to offer a solution that would offer the fairest fare to passengers then obviously you'd want to consider the PAYG plus fare capping model. And establish a fare policy that would encourage people to use that system by capping fares at a cost that would be at or below the cost of purchasing a prepaid pass. Focusing on merchant fees is also an important best practice to mitigate the cost associated with implementing open payments acceptance. As the bullet point says, do the math. Confirm that the fees are affordable and reasonable. Some transit agencies have increased the cost of a full fare, single ride ticket in order to ensure that the cost of the merchant fees is mitigated or completely paid by the passenger. Consider also aggregation as a mitigation for the cost, but understand that there may be risks associated with implementing aggregation depending on the card networks that you accept. Passenger inclusion is also an important consideration, in particular, to mitigate potential complaints associated with Title VI violations. Define solution that supports your unbanked passengers in particular. Remember that all passengers will not have or will not be able to qualify for a bankcard or a mobile wallet using bankcards. Therefore, you must either offer them a solution to allow them to use your open payments acceptance system. Or ensure that your policies do not favor open payments acceptance over passengers who cannot use it. Minimize your reliance on bank issuance of contactless cards is also an important consideration because as I mentioned, previously, the vast majority of passengers today will neither have a card or a mobile phone that can be used in an open payments acceptance system. Now, let's go through one final set of important considerations and that is those things that are necessary to support cost shifting and sharing as one example. Cardholder acquisition is something that you can reduce your reliance on simply because you'll move this responsibility to card issuers. You'll also shift the responsibilities for card and account lifecycle management in particular, card replacement when the cards are lost or stolen or expired you won't be responsible for issuing their new card. The issuers will be to the extent that the cardholder has elected to use your open payments acceptance system using their contactless card or mobile wallet. It's also important to reduce the usage of fare product sales in the network and you can do so by reducing reliance on ticket vending machines, transit retail stores and website and mobile app if you implement one of the first two methodologies for open

payments acceptance. That is the PAYG only model. Or the PAYG model with fare capping. In doing so you'll also reduce reliance on agency issued fare media. Passenger convenience is also an important consideration. In many systems passengers are unfamiliar with the agency's fare policy and they will be reluctant to ride simply because they don't know how much they have to pay. They also don't know what fare products the agency offers and don't know how to purchase them. Most of these considerations will go away simply because the passenger only needs to know that they present their contactless bankcard or their mobile wallet at the gate or on board a bus in order to ride. They therefore don't need to know the fare. They don't need to carry exact change a common requirement for transit agencies to clear buses that can't make change on board. And there's no need for the passenger to even understand what the fare products that are offered by the agency are let alone to actually have to purchase them. And, of course, the need to maintain a ride history can be shifted largely to the issuer because the issuer will be regularly issuing statements on the accounts anyway that tell the passenger where they made payments. Now, let's go into our third activity. The question is, which of the following is not a key risk associated with the implementation of open payments acceptance with an electronic fare payment system? The choices are A, obsolete technology. B, Operational Costs: Standard compliance and merchant fees. C, bankcard data breach. And D, issuer participation. Let's review the answers. The correct answer is A, obsolete technology. This is correct although the potential for technology to be or become obsolete within the expected life of an electronic fare payment system is always a concern, this is not a risk specific to open payments acceptance. The answer B operational costs is incorrect. The regulations, standards, specifications and fees applicable to open payments acceptance is constantly changing making the costs associated with these elements a key risk for the agency. Answer C, bankcard data breach is also incorrect. The acceptance of open payments may make the agency a target for theft of the bankcard data it holds or is processing. And finally, D, issuer participation is also incorrect. Open payments acceptance is dependent on wide spread issuance and promotion of contactless bankcards. As the final part of our module, I'd like to do some case studies of agencies that have implemented open payments acceptance. Our first case study is for the Utah Transit Authority. The Utah Transit Authority's program was simply called the electronic fare program and they implemented a model that included only PAYG. Highlights of the program included that the program was originally launched for visitors during the skiing season. For those of you who are not familiar, the Utah Transit Authority serves the Salt Lake City area which has about nine major ski resorts within about twenty minutes of the downtown area. The agency has implemented

programs that promote the use of mobile wallets for fare payment. Unfortunately, after six years of implementation the open payment system has less than one percent of its ridership being used. A key consideration associated with this particular case study is that the agency ultimately decided to issue a closed loop card as its primary payment media. Our second case study is for the Transport for London system. This system known as contactless EMV employs the PAYG plus fare capping model. The highlights include and this is very unusual that the agency developed and operates the contactless platform itself, that is it did not use or only partially used the services of a system integrated to help develop and implement and operate this particular system. The open payment system was added as a layer on top of an existing electronic fare payment system known as Oyster. It has growing use of contactless bankcards. And it took advantage of the fact that retail use of the bankcards in places outside the trans system is also growing. After just the first 48 months over 300 million fares had been paid using contactless bankcards and mobile wallets. A key consideration associated with this particular implementation is that interchange is restricted at 0.3 percent according to EU regulations recently implemented. Our third case study is associated with the Chicago Transit Authority. Their program is known as the Ventra Card. This particular model employs the PAYG, plus account-based solution. Highlights for this particular program include that all media adhere to the card networks specifications including the media issued by the transit agency. The agency also successfully transferred the vast majority of financial and technical risk to the integrator who is also the operator of the transit system. The transit system includes a prepaid debit card as the primary media issued by the integrator/operator of the system on behalf of the transit agency. After three full years of service the open payment solution is used by less than two percent of the total ridership largely because contactless bankcard issuance in this region has dropped to almost zero. One key consideration associated with this particular case study is that there are a lack of contactless cards and mobile wallet users in this region and quite frankly in all of the United States at this current time as previously mentioned. One of the questions that was asked by the audience during the original filming of this module was whether or not there will be a solution like EasyPass on the east coast. For those of you who have not used the EasyPass system, this is a system for toll payments that is used pretty much from Florida all the way up through northern New York and New Jersey. It is a single system that allows an individual in a vehicle using a transponder to make toll payments throughout that entire corridor. Unfortunately, I'm not aware of any movement within the industry today to move towards a model like EasyPass where open payments acceptance would be common across

multiple agencies. There certainly have been discussions among agencies about doing multiagency implementations. But to date that has not actually come to fruition. Before I go into this final slide which is a review of what we have learned I also want to mention that there was another question that was asked. And that particular question is whether or not there have any efforts within the industry to negotiate with the card networks for lower interchange. I am aware of one particular effort. However, as best as I understand that effort implemented by some of the largest transit agencies in North America did not result in any reduction interchange or any particular response from the card networks indicating that a reduction would be possible. It certainly is possible to negotiate with the card networks. But it would take a significant effort on the part of the majority of transit agencies in the country, in my opinion, to be successful simply because if you look at the total dollar amount of fare payments that are made in all of the United States today it pales by comparison to some of the other industry segments such as convenience stores, restaurants, et cetera, which process tens of billions of dollars annually; where in the United States the total volume of transactions for fare payments is somewhere around \$13 billion. Now, let's go into a review of the overall module. What we've learned is that open payments acceptance is defined by various international standards, specifications and federal regulations. There are three primary options for implementing open payments acceptance. Those options include the PAYG only model, the PAYG plus fare capping model, and the PAYG plus account based solution. There are distinct costs, risk and benefits associated with open payments acceptance. I'd like to thank you all for participating in and listening to this particular model. I appreciate it if you would provide your feedback using the feedback link below, providing your thoughts and comments on the value of this training. Thank you, again, for your participation.

Gary Yamamura: Another best practice to consider is in the category of cost shifting and sharing. You'll remember that one of the benefits associated with open payments acceptance is that we can move some of our costs to the issuer. Some of those costs would include cardholder acquisition, card and account lifecycle management, as well as reducing the usage of fare product sales network, in particular, the usage of vending machines, transit and retail stores, a website, and mobile apps. And finally, reducing reliance on agency issued fare media. All of these are possible with a broad well executed open payments acceptance solution. And our final best practice to consider is one associated with passenger convenience. As mentioned previously, one of the key benefits associated with open payments acceptance is that we make life for the

passenger easier and simpler for them to use the fare payment system. In most systems today passengers must understand how to pay fares as well as understand what the fares are. A great example of this is someone boarding a bus for the first time. Without understanding what the fare policy is the passenger would not know what category they fall in and therefore would not know how much they need to pay. If, for instance, the fare was \$2 they may not know that the fare is \$2 let alone that they need to be carrying \$2 in exact change because, as we know, most buses do not have the capability of issuing change to a passenger. So this requires the passenger to have a familiarity with the fare policy of the agency, understand what fare payments or products can be purchased in advanced and need to know what the exact fare is as well as carrying exact change. All of these things are eliminated or at least largely reduce with an open payment acceptance system in particular those employing the PAYG and PAYG plus fare capping model where no knowledge of the fare policy is necessary other than you simply need to tap your card or tap your mobile phone against the reader to facilitate a fare payment.

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