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1.0 Introduction

The Pennsylvania Department of Transportation (PennDOT) commissioned a consortium of consultants led by Wilbur Smith Associates (WSA) to investigate potential identification systems for use by the Commonwealth of Pennsylvania's Free Transit Program, which allows senior citizens to ride participating fixed route transit services free of charge during off-peak periods.

1.1 Overview of Free Transit Program

The Free Transit Program (FTP) is one of the oldest, most progressive and far-reaching senior citizen transportation programs in the country. Originating in 1973, the FTP is organized such that PennDOT reimburses transit operators the full fare for trips made by persons aged 65 or over whom use local, off-peak fixed route transit services in the Commonwealth. A copy of the most recent FTP PennDOT Department Directives listing and defining individual program elements is included as **Appendix A**.

The FTP has been widely praised for improving the mobility of senior citizens and reducing the costs of travel to participants and public transportation providers. By providing free off-peak fares on fixed routes, the program encourages seniors to use lower-cost, fixed route services instead of higher-cost demand response paratransit services. Increasing riders and revenues for fixed route systems also financially supports the transit agencies. The FTP is funded primarily by lottery proceeds (71 percent of program funding in FY 04-05) with supplemental revenue received from the general fund. An overview of the FTP, including total number of rides taken, annual program costs and average costs per trip is shown in **Table 1**.

Table 1: Free Transit Program Usage, Program Costs and Cost per Trip

Year	Number of Free Transit Trips	Program Costs	Average Cost Per Trip
FY 02-03	39.5 million	$68.1 m	$1.72
FY 03-04	40.8 million	$69.6 m	$1.71
FY 04-05	38.7 million	$73.4 m	$1.90

Source: PennDOT/WSA

As is the case for all operators nationally, transit providers in the Commonwealth receiving funds through the Federal Transit Administration (FTA) are required by Federal Statute (49 USC Chapter 53 – see **Appendix B**) to offer fares to persons with disabilities during off peak hours which are no more than 50 percent of the peak hour fare of able-bodied customers. These reduced fares are not reimbursed to operators. The "Half Fare Program" is a federal requirement therefore PennDOT does not have administrative responsibility for this program. Similar to the FTP, however, PennDOT sets the design for the Commonwealth Reduced Transit Fare ID Card to simplify transferability between systems for users.

1.2 Study Objectives

The WSA Study Team examined Pennsylvania's Free Transit Program with an emphasis on evaluating identification and fare collection systems as tools to improve program administration and service delivery. While the primary focus of the research is identification systems for senior citizens, a secondary objective is to suggest systems that will record transit use by persons with disabilities. The research objectives are to:

- Evaluate the current state of practice regarding identifying senior citizens and persons with disabilities, especially in transit markets;
- Recommend a strategy for the Commonwealth of Pennsylvania to develop a statewide identification method for free and half-fare transit travel; and
- Recommend a future direction for using an electronic format to capture transit use among these populations.

1.3 Research Methods

To fulfill these objectives, the Study Team worked with a Steering Committee comprised of representatives from stakeholder groups including the Bureau of Driver Licensing (BDL), the Department of Aging, transit agencies in the Commonwealth and PennDOT. The Steering Committee met with the Study Team monthly on conference calls and quarterly in person to discuss research progress, methods and key policy questions. Steering Committee members also served as key resources throughout the project by providing connections, information and contacts to local and regional issues.

To conduct the Study, the WSA Team collected a combination of primary and secondary research data and employed a variety of qualitative and quantitative techniques. The methods included a literature review, a review of best practices, a quantitative survey conducted among transit agencies participating in the Free Transit Program, detailed key informant interviews, and stakeholder focus groups. We also prepared a series of cost benefit analyses, initially on the full range of alternatives and subsequently on the recommended strategy. In most cases these research steps are referenced in the final report with documentation of the full exercise included as appendices. An overview of the Study Process is shown in **Figure 1**.

1.4 Report Organization

Our final report is organized into five additional sections:

- **Section 2:** Overview of Identification Systems and Technology;
- **Section 3:** Identification Systems: Issues and Technology;
- **Section 4:** Implications for the Free Transit Program;
- **Section 5:** Development of Alternatives; and
- **Section 6:** The Preferred Strategy.

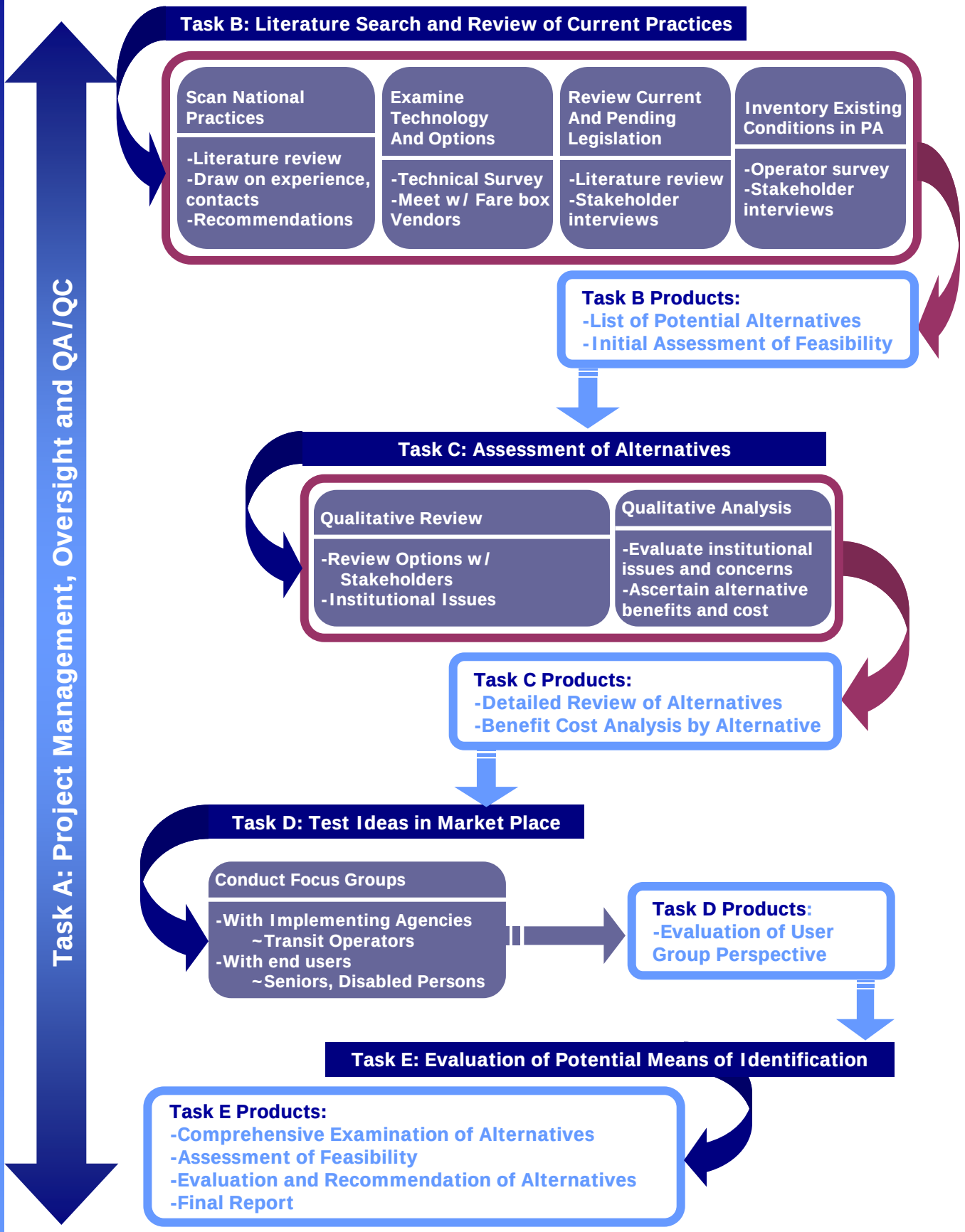

Figure 1: Project Overview

2.0 Overview of Identification Systems and Technology

As a backdrop to the design and evaluation of different strategies for a statewide identification system, the following section presents an overview of three of the most widely applied methods of reading data from encoded cards – barcodes, magnetic stripes or smart cards. This section also discusses the application of these technologies to public transportation fare collection and identification systems, especially as they relate to the Free and Half Fare Programs.

2.1 Barcodes

Barcodes are a familiar technology because most products for sale in stores, especially grocery stores, are packaged with a barcode that is scanned at the checkout counter. Barcodes work by encoding numeric or ASCII (text) information with a series of vertical stripes that create an identification that can be read by a bar code reader. This identification code is associated with other information stored in a database for retrieval, such as a product price. **Figure 2** shows a conventional one dimension barcode.

Figure 2: Conventional one dimension barcode

Barcodes have several advantages for identification. They can be easily and inexpensively produced using a regular laser printer and barcode software. Barcodes are also reasonably durable, depending on the reader. If the codes are read by a handheld reader and there is no contact between the reader and the code, bar codes can last indefinitely. Barcodes also offer the advantage of standardization; the translation between a number of characters to a code is the same for all barcodes.

Barcodes can be printed onto labels that can be adhered to cards for a very simple and inexpensive system. A major disadvantage of the technology is that barcodes can be easily counterfeited through photocopying. Another disadvantage of barcodes is that they offer "read only" capabilities, meaning data cannot be written to documents or items encoded with a bar code.

2.2 Magnetic Stripe Cards

A second common form of identification technology is magnetic stripe or "magstripe." Magnetic stripe cards are common throughout the U.S., used in ATM and credit cards, identification cards and driver's licenses, although most driver licenses have both a barcode and a magnetic stripe. Magnetic stripes have limited read-write capability. Some transit systems sell stored value magnetic cards, which have a certain number of "trips" or cash value stored on them. As the cards are swiped through a reader, a code is sent to the card to de-activate the trip value (see **Figure 3**).

Figure 3: Magnetic Swipe Card Readers

Magnetically encoded cards typically have three magnetic stripes (or tracks) that are a specific distance (set by standard) from the edge of the card. There are standards for which type of data is stored on each track governed by International Standards Organization (ISO)/ International Electro-technical Commission (IEC) standards:

- Track 1 is reserved for proprietary use by the issuer of the card. Data on track 1, therefore, will vary by type of card.
- Track 2 is typically the most commonly used track to store the unique identity number of the card. Readers of magnetic stripe will usually read track 2 only, although new reading devices are available that can read all three tracks.
- Track 3 is used for read/write capabilities. Magnetic stripe cards have the ability to be written to; meaning devices (write heads) can transfer information to a card. Such transactions are normally, though not always, done on track 3.

The American Association of Motor Vehicle Administrators (AAMVA) sets standards for driver's licenses. Track 1 contains information as to the holder's name and address. Track 2 holds the most data and AAMVA has standardized writing on this track. Track 2 on most driver's licenses will contain the birth date of the card owner and the expiration month and year of the card. Track 3 is typically not used in driver's licenses.

There are two types of magnetic cards: high coercivity and low coercivity. "Coercivity" is a measure of the durability of the magnetic encoding. Cards expected to be used infrequently are typically low coercivity while more frequently used cards, such as those for building access, are generally high coercivity. Pennsylvania driver's license cards are issued with high coercivity magnetic stripe. A magnetic stripe reader can read either type of cards.

Advantages of magnetic stripe cards are that they are relatively inexpensive and easy to produce. Transit operators who use monthly passes arrange to have magnetically encoded cards printed for about $0.04 - $0.10 per document. Printing can be done on paper stock or more durable materials such as mylar. A disadvantage of magnetic stripes, not encountered by barcodes, is that they can be demagnetized by being placed in contact with a strong magnetic field.

2.3 Smart Cards

A third relevant identification technology is smart cards. While currently not as common as bar codes or magnetic stripes, smart cards are an emerging technology, with an increasingly presence in the marketplace. Some transit systems already use this technology for fare collection.

A smart card is a small electronic device about the size of a credit card that contains electronic memory, and possibly an embedded integrated circuit (IC). Smart cards containing an IC are sometimes called Integrated Circuit Cards (ICCs). Smart cards are used for a variety of purposes, including storing a patient's medical records, storing digital cash (e.g., a debit card) and generating network IDs (similar to a token). To use a smart card, either to pull information from it or add data to it, one needs a smart card reader, a small device into which the smart card is inserted. **Figure 4** shows a smart card in use.

Figure 4: Smart Card in Use

Among the critical advantages of smart cards over other technologies, is its capability to quickly transfer information between the card and the reader (or processor). Industry nomenclature for this is “read-write capability.” Its application to the transit industry means that the reader can “read” the card to recognize that the card holder is eligible for free or half fare, then “write” to the card and deduct the appropriate fare. Readers can be programmed to deduct fares based on time of day, boarding location, eligibility classification, etc.

Another advantage of smart cards for over 9.2 million transactions a day, is that readers can be programmed to read “contact” or “contactless” (or proximity) cards. Contact cards require users to either insert the card into a reader or tap it on a reader. Contactless cards, on the other hand, only need be held (i.e., in proximity to) a reader and do not require the card holder to take their card out of their pocket, wallet or bag. For purposes of this report, the Study Team has assumed future smart card technology will adopt contactless cards. Contactless cards hold the greatest benefits for seniors and persons with disabilities because they are easier to use. This technology also offers transit operators benefits by decreasing transaction and dwell times.

The most significant smart card success story is from Hong Kong, where 95 percent of the population holds a stored value “Octopus” smart card. The Octopus card can be used to pay fares throughout Hong Kong’s public transportation network, including

subways, buses, ferries, minibuses and taxis. The card has gained acceptance and popularity; there are now over 50,000 readers available to card holders including convenience stores, fast food restaurants, coffee shops, pay phones, vending machines, theme parks and schools. Hong Kong residents use smart cards for over 9.2 million transactions a day with annual transactions totaling about US$3 billion.

2.4 Fare Collection Systems in the Public Transportation Industry

The majority of bus transit passengers in the United States pay fares by either:

- putting cash in an on-board fare box;
- showing (or flashing) a transit pass or identification card to the driver; or
- swiping a card in a fare box reader.

Transit systems typically collect cash fares by instructing passengers to put their fares in an on-board transit fare box. Although the systems do not make change, drivers are not required to handle cash and the fare boxes provide secure storage of cash. The most common form of fare box in use across the U.S. is the GFI Cents-a-Bill fare box. Cents-a-Bill fare boxes may also be equipped with a swipe reader (i.e., TRiM unit), which can read magnetically encoded cards. A more recent and updated version of the Cents-a-Bill is the GFI Odyssey system, all of which are equipped with a swipe reader.

Most transit agencies sell some form of monthly or periodic pass. If transit vehicles do not have a card or pass reader, travelers simply show their pass to the driver, who may record the trip either on a key board attached to the on-board fare box, manually or not at all.

If the vehicle has a swipe reader, passes can be printed with a magnetically encoded stripe and "swiped" in the reader. As passengers swipe their card, the fare box confirms the pass is valid and records usage. Some transit systems use magnetically encoded stored-value cards whereby readers deduct a fare or trip from the card, such as for a 10-ride card or a $10 card. Fare boxes equipped with swipe readers can also collect additional data about the trip from the card reader, although in reality few systems take advantage of this feature primarily because of the technical skill required to process the information.

Rail systems, on the other hand, typically process fares at attended stations. Usually, tokens or tickets are sold by agents or in vending machines. Rail transit stations often have magnetic card readers to activate a turnstile when a valid card is swiped through it.

Increasingly public transit agencies are transitioning from magnetic stripe technology to contactless smart cards. Among the most prominent is the Washington Metropolitan Area Transit Authority (WMATA)'s SmarTrip system, launched in 1999. The SmarTrip system allows travelers to pay MetroRail, MetroBus and Metro-operated parking lot fees with one plastic stored value card. Other systems are currently testing or transitioning to smart card technology including Harris County Metro (Houston, Texas), Capital Metro (Austin, Texas), Bay Area Rapid Transit (BART) (San Francisco, California), and King

County Metro (Seattle, Washington). All systems allow fare payment by cash and many are also retaining their magnetic stripe cards, at least during a transition phase.

The Study Team also developed a series of case studies as a tool to examine the application of various technologies in the real world. These case studies are provided in **Appendix C – Case Studies in Transit Fare Collection Technology**.

2.5 Fare Collection Technology in Pennsylvania

2.5.1 Fare Collection Systems

There are currently 53 public transportation providers in the Commonwealth participating in the Free Transit Program. Of these 53 operators, the two largest systems, the Southeastern Pennsylvania Transportation Authority (SEPTA) in Philadelphia and the Port Authority of Allegheny County (PAT) in Pittsburgh dominate the program, representing more than 80 percent of the program rides and budget; with SEPTA representing the majority of rides. The second sub group of 51 smaller operators provides a combination of rural, suburban, small urban and private sector services. The fare collection technology used by this diverse group of operators is likewise varied.

Using data collected from an email survey distributed to each of the 53 public transportation providers in the program, the Study Team assessed current technologies used in Pennsylvania, the age of these systems and operator replacement plans. (A full report on the operator survey is provided in **Appendix D – Survey Report**.)

In terms of bus revenue vehicles, about half (51 percent) of the fleet statewide currently uses the GFI Cents-a-Bill fare box with a swipe reader, with SEPTA vehicles representing the majority of this group. By including the GFI Cents-a-Bill fare box without a swipe reader, the portion of the fleet with similar technology increases to approximately 88 percent. In terms of overall operators, however, nearly 65 percent of operators do not currently use on-board fare box systems or did not report the type of fare collection technology used in their system. While a large portion of operators, this affects only eight percent of the fleet statewide. An estimate of bus fare collection technologies currently in use among Free Transit Program transit operators is shown in **Table 2**.

In terms of the age of existing fare boxes across the Commonwealth, our data suggests that approximately 38 percent of operators currently use fare boxes that are ten or more years old, and another 22 percent of operators have fare boxes less than five years old. Both SEPTA and PAT currently use older technology and our discussions with these operators confirmed that both SEPTA and PAT are looking into replacing their fare collection technology. Accordingly, our survey analysis shows that 91 percent of all fare boxes are more than ten years old and there are replacement plans for approximately 84 percent of fare boxes statewide. This data is shown in **Table 3.**

Table 2: Fare Box Technologies in use by Free Transit Program Participants

Fare Box Type	Operators/ Systems	Percent of Operators (1)	Revenue Vehicles	Percent of all Vehicles (1)
GFI Cents-a-Bill with swipe reader	4	7.1%	1,860	51.2%
GFI Cents-a-Bill without swipe reader	12	21.4%	1,343	37.0%
GFI Odyssey with Swipe reader	4	7.1%	151	4.2%
No Fare box	7	12.5%	4	0.1%
Other	9	16.1%	186	5.1%
Unknown	20	35.7%	89	2.4%
Total	**56**		**3,633**	

Source: WSA Study Team
Note: (1) Refers to percentage of operators and vehicles reporting, does not include operators not responding. (2) Does not include heavy or commuter rail.

Table 3: Ages of Existing Fare Boxes and Replacement Plans

	Operators/ Systems	Percent of Operators (1)	Fare Boxes	Percent of all Fare Boxes (1)
Fare Box Age				
Less than 5 years	8	22%	159	4%
5-10 years	8	22%	156	4%
More than 10 years	14	38%	3,272	91%
Not Applicable	7	18%	7	<1%
Fare Box Replacement Plans				
Within 5 years	13	35%	3,029	84%
No Plans	18	49%	546	15%
Upgrade	1	3%	12	<1%
Not Applicable	5	14%	7	<1%

Source: WSA Study Team
Note: (1) Refers to percentage of operators and fare boxes reporting, does not include operators not responding.

2.5.2 Preferences for New Systems – Identification Systems and Data Collection

The Study also collected information on transit operators' preferences and priorities for future identification systems and potential data collection systems. In terms of future identification systems, operator preferences as recorded in the operator survey conducted as part of this research include the following features:

- **Travelers with Disabilities** – The system should be able to accommodate the half-fare program for travelers with disabilities as well as the free fare program for senior citizens;

- **Records information** – The system should have some capability to record information about the use of the system;
- **Photo ID** – The card should have a photo ID to reduce fraudulent use; and
- **Universal** – Cardholders should be able to use the card statewide.

Our analysis also suggested that features associated with fraud prevention (photo ID, identification of riders with disabilities, lost or stolen card reporting, invalidation during peak hours, etc.) were more important to urban operators than their rural and private counterparts.

When asked about data collection capabilities of fare and identifications systems, operators reported a preference for information such as date, time, route, block[1] (or run), location, vehicle number, participant's usage rate and user demographics. The data also revealed preferences for date and time of use as well as the route taken. This was true for all operators in the Free Transit Program except the private operators.

2.5.3 Smart Card Development in Pennsylvania

None of the transit operators in the Commonwealth of Pennsylvania currently have smart card systems in place, although SEPTA and PAT are pursuing the technology in unrelated efforts. In addition, although outside of the SEPTA system, the Port Authority Transit Corporation (PATCO) is testing a smart card system on its 14-mile rail line linking New Jersey and Philadelphia.

In Pennsylvania, PAT will likely be the first transit operator in the Commonwealth to pursue smart card technology. PAT is leading the process in part because its current fare collection system is outdated and consists of monthly flash passes and GFI Cents-a-Bill fare boxes. The fare boxes are not currently equipped with TRiM units nor do they validate bills or coins. Although funding has not yet been secured, PAT has developed a schedule that calls for a Request for Information (RFI) to be released to the industry in late summer/early fall 2006, followed by a Request for Proposals (RFP) to be issued in late 2006/early 2007. A pilot demonstration project may take place as soon as late winter/early spring 2007. Revenue deployment may be as soon as the end of 2007. The largest obstacle to adhering to this schedule is funding.

SEPTA is also currently engaged in a "Fare Collection Modernization" study, which is examining and evaluating potential fare collection systems appropriate for southeastern Pennsylvania. Smart card technology is one of the options being evaluated as a replacement fare collection system as is the potential of a dual-technology system that includes both magnetic stripes and smart cards. The study is expected to recommend a future direction later this year, at which point the study will move into more detailed design and implementation to support project initiation. Staff from SEPTA felt the earliest that new fare collection technology would be available in southern Pennsylvania

[1] This is the vehicle assignment number. The run is usually the driver or crew assignment number.

would be five years from project initiation, likely sometime towards the end of 2010. Accordingly, it is likely that magnetic stripe technology will be used by SEPTA at least for the next five years.

3.0 Identification Systems: Issues and Technology

As part of the program inventory, the Study Team also considered the wider issues surrounding identification systems nationally and within the Commonwealth of Pennsylvania. This step was undertaken for a number of reasons, including the fact that an idea included in the project scope was the potential of dovetailing existing Driver's licenses and State ID systems with the Commonwealth Transit ID card to simplify access to the Free Transit Program. Early investigation revealed that it was technically feasible for most fare boxes in the Commonwealth, with modification, to read existing Pennsylvania driver's licenses.

3.1 National Review of Current and Pending Federal and State Legislation

Since the early 1990s, there has been modest movement across the U.S. toward modernizing the design of, and process for, issuing identification cards and driver's licenses. The events of September 11, 2001 and resulting concerns about homeland security have accelerated interest at the federal and state levels in making personal identification methods both more robust and more secure. Legislative and policy actions are addressing this in two main ways: (1) by strengthening the process by which identification cards and driver's licenses are issued; and (2) by making the cards and licenses themselves more technologically advanced.

3.1.1 Identification Card Issuance Process

As a first major action to update the driver license issuance process, Congress passed the "Intelligence Reform and Terrorism Prevention Act of 2004," which required the involvement of state elected officials, state DMV officials and the U.S. Department of Homeland Security to implement new federal standards for driver's licenses, including minimum standards to ensure the integrity of state driver's license issuance and verification. The new standards are applicable to documents used to prove identity, the verification of identification documents, how applications are processed and what information is included on driver's licenses and identification cards.

The 2004 Act, however, was superseded in May 2005, when Congress passed, and the president signed, the "REAL ID" Act as part of the "Emergency Supplemental Appropriations Act for Defense...2005" (5/11/2005, HR 1268). The REAL ID Act includes significant driver's license and ID card provisions with which states will be required to comply.

Among its provisions, the REAL ID Act states that:

- Beginning 3 years after the Act's enactment (i.e., May 2008), driver's licenses and ID cards cannot be accepted by federal agencies for any "official" purpose unless they meet the Act's requirements;
- The requirements do not cause any immediate change in state laws or administrative procedures;
- Driver's licenses and ID cards already issued remain valid; and
- States may choose not to have their driver's licenses and/or ID cards meet the Act's requirements for reasons of public safety, cost or other public policy

reasons, and their residents may present alternative documents for federal official purposes.

The Department of Homeland Security (DHS) is required to promulgate implementing regulations for the REAL ID Act, but has yet to do so and there is no official estimate of when such regulations will be put forth. Therefore, states that have begun to implement the Act's provisions may need to revise their procedures once regulations are promulgated.

3.1.2 State Legislation – 2005 Activities

The driver's license has evolved over the years to a role beyond traffic safety, where both government and private entities rely on the license for personal identification, state legislatures and driver's license agencies are concerned about the safety and security of the license as an identifier. In recent years, and particularly since September 11, 2001, legislators have focused on "lawful presence" requirements[2] and driver's license and ID card eligibility issues, including what documents should be acceptable documents for proving identity.

During the 2005 state legislative sessions, at least 78 bills were introduced in 28 states related to driver's licenses and identification cards. Many of the bills introduced in the states during 2005, however, lost momentum when Congress passed the REAL ID Act, since the new requirements states would be facing became murky and there was little interest in making major state-level changes that would be contradicted or complicated by the new federal law. Many states are apparently in a "waiting mode" at this point and are taking only incremental steps toward implementing provisions similar to those in the REAL ID Act.

3.1.3 Identification Card Designs and Technologies

Legislation, rules and policies have also been developed and proposed at the federal and state levels for making identification cards and driver's licenses more fraud-resistant and technologically advanced.

Federal Legislative Activity

The REAL ID Act of 2005 is being interpreted by various parties as a major stepping stone toward national standardization of identification cards within a smart card framework. The Act allows the Department of Homeland Security (DHS) to specify the "machine-readable" technology used in IDs as well as any biometric data such as fingerprints or retina scans. This provision has led some people to characterize the Act as the impetus for significant expansion of smart card deployment across the country. However, since DHS has yet to promulgate regulations for implementing the REAL ID

[2]By definition, all U.S. citizens and U.S. nationals are lawfully present in the United States. Those who are neither U.S. citizens nor U.S. nationals ("noncitizens") are considered lawfully present in the United States if they have an immigration status. Among the many different categories of immigration status are lawful permanent residents (those holding a "green card"), refugees, asylums, people granted temporary protected status, and people who have been granted employment authorization by the Bureau of Citizenship and Immigration Services (BCIS).

Act, it is premature to estimate the extent and nature of smart card usage and related expansion.

State Activities

Most current state-level activity appears to be focused on improving ID card issuing processes and upgrading technology to enable use of smart cards across purposes and agencies. States are also beginning to consider whether and how to respond to the biometric data requirements of the REAL ID Act in the design and format of ID cards and driver's licenses. These requirements include having digital photos and signatures on each document as well as making them machine-readable (as noted above, the machine-readable technology standards have yet to be determined).

3.2 Existing Identification Systems in Pennsylvania

3.2.1 Overview

Pennsylvania currently issues state identification cards in the form of driver's licenses and photo ID cards. The photo ID cards are similar in appearance to driver's licenses (see **Figure 5**), and contain similar information. As is the case with driver's licenses, the Photo IDs are issued by the Pennsylvania Department of Transportation's Bureau of Driver Licensing.

Figure 5: Pennsylvania Photo ID Card and Driver's License

The information provided on the ID cards includes:

- ID number
- Date of birth
- Eye color
- Height
- Date issued
- Expiration date
- Signature
- Name and address
- Photo
- License class
- Restrictions
- Organ donor status

3.2.2 Eligibility

Pennsylvania Photo ID cards are issued by the Bureau of Driver Licensing in a similar manner as Driver's licenses. Any Pennsylvania resident is eligible to obtain a photo ID (although there is no practical reason for those with a driver's license to do so). They are issued at a cost of $10.00 and are valid for four years. Persons aged 65 or older may opt to renew their license every two or four years. It is necessary to go to a BDL office to initially obtain the card, but they can be renewed by mail or online.

To obtain the photo ID card, residents must provide proof of identification and proof of residence. Acceptable proof of identification by residency:

For U.S. citizens – social security card plus **one** of the following:	▪ For U.S. born residents, birth certificate with raised seal issued by an authorized government agency; ▪ Certificate of U.S. Citizenship (BCIS/INS Form N-560); ▪ Certificate of Naturalization (BCIS/INS Form N-550 or N-570); ▪ PA Photo ID Card; ▪ PA Photo Driver's License; ▪ Valid U.S. Passport; or, ▪ U.S. Military Photo ID Card.
Non-U.S. Citizens must provide **all** of the following:	▪ Social Security Card unless not eligible; ▪ Valid Passport; ▪ All original (BCIS/INS) documents; ▪ If a student, written verification of attendance from school; or, ▪ If employed, written verification from employer.
All applicants must provide two forms of proof of residency, which can include:	▪ Current utility bills (water, gas, electric, cable, etc.); ▪ W-2 form; ▪ Tax records; ▪ Lease agreements; ▪ Mortgage documents; or, ▪ Current weapons permit.

Source: WSA Study Team

As of 2004, there were 1,896,503 seniors (65 and older) in Pennsylvania. Of these, 1,405,531 (74 percent) have driver's licenses, and 161,600 (9 percent) have photo IDs. Accordingly, about 329,372 individuals or about 17 percent of the population hold no state-issued identification.

Procedures for Determining Driving Restrictions and Disability Status

Before obtaining their first driver's license, Pennsylvania residents are required to first obtain a learner's permit. As part of the process of obtaining a learner's permit, applicants must get a physical examination at which a medical provider certifies whether the applicant has any conditions that would affect his or her ability to drive. Driver licensing personnel do perform eye tests, but otherwise, screening is based solely on the

information provided by the medical examiner on the learner's permit form. The cards are then issued on the spot at the individual BDL offices.

Once a person has a license, subsequent certification is not required. However, Pennsylvania state law requires medical providers to inform the state if they become aware of changes in a person's medical condition that would affect their ability to drive. There is also a process for private citizens to report concerns about a person's ability to drive, at which point the BDL can require the license holder to submit to a medical exam.

3.2.3 Information Technology

Pennsylvania driver's licenses and photo ID cards contain information in three formats: the printed information on the face of the card, and the same information, except the photo, on a magnetic strip and a 2-D bar code on the back, including date of birth of the card holder. The information is encoded using the data format recommended by the American Association of Motor Vehicle Administrators (AAMVA) in 1995.

Currently, the Commonwealth of Pennsylvania uses the magnetically encoded information for two non-driving-related age verification purposes: (1) to purchase alcohol and (2) to purchase lottery tickets. In addition, some grocery stores use the magnetically encoded data to verify the identity of customers paying by check.

4.0 Implications for the Free Transit Program

The Study Team combined the information from the first stage of research to identify a series of critical elements required for future systems to identify senior transit riders in Pennsylvania. Accordingly, future identification systems should:

- Encourage use of fixed route services among all intended beneficiaries;
- Be simple for seniors to understand, access and use. "Using the system" includes obtaining identification cards and using the card to receive free travel;
- Understand that resources for system improvements are limited for all stakeholder groups. Any recommended system should not create significant financial burdens for seniors, transit operators or the Commonwealth of Pennsylvania;
- Be adaptable to future changes in technology, such as smart card technology, without imposing hardships on users or financial burdens on program administrators or transit agencies;
- Be functional and accessible to the full range of transit operators in the Commonwealth, including large systems such as SEPTA as well as small rural operators;
- Enable transit operators (drivers and ticket agents) to determine if person using the card is the same person to whom card was issued;
- Record and track use of transit systems for seniors who are riding free as well as persons with disabilities who pay reduced fares;
- Permit users to pay discounted or free fares at transit access locations that are un-staffed, such as rail stations or that have alternative fare collection methods, such as off-board systems;
- Facilitate improved understanding of senior travel patterns and improved marketing capabilities; and
- Allow for universal access and use within Pennsylvania.

Building on these criteria, the Study Team also identified three important stakeholder groups in the FTP:

- **Program Participants** – primarily includes senior citizens aged 65 or older. A related group of beneficiaries is persons with disabilities, including those with temporary and permanent disabilities;

- **Program Administrators** – PennDOT program administrators who manage and oversee use of public transportation resources to provide the most effective and efficient services possible; and

- **Service Providers** – transit operators across the Commonwealth of Pennsylvania who provide service to seniors and persons with disabilities.

As shown in **Table 4,** The Study Team also identified a series of broad issues that highlight the concerns and needs of each of the stakeholder groups.

Table 4: Free Transit Program Stakeholder Groups

	Persons aged 65 and over	Persons with Disability	PennDOT	Public Transportation Providers
Stakeholder Description	▪ Permanently eligible	▪ Permanent & temporary eligibility	▪ n/a	▪ 53 systems in Commonwealth
Primary Interests	▪ Program is straight-forward. ▪ Cards are easy to obtain. ▪ Cards are easy to use.	▪ Program is straight-forward. ▪ Cards are easy to obtain. ▪ Cards are easy to use.	▪ Record trips by seniors accurately.	▪ Seniors are easily identified. ▪ Senior trips can be recorded electronically.
Secondary Interests	▪ Cards are accepted on all systems statewide.	▪ Cards are accepted on all systems statewide.	▪ Encourage participation in program.	▪ Encourage participation. ▪ Data allows for planning and market research.

The systems criteria and stakeholder needs and concerns were subsequently combined into a screening matrix that was used to develop and broadly evaluate potential alternatives. This matrix is included as **Table 5**.

Table 5: Evaluation Criteria for Short-to-Medium Alternatives and Primary Stakeholder Group Affected

Criteria	Definition	Critical Stakeholder Group		
		Program Beneficiaries	Program Administrators	Service Providers
Statewide acceptance	Can be used on all participating transit agencies	✓	✓	✓
Statewide access	Is accessible to all populations and regions	✓	✓	✓
Photo ID	Has photo identification			✓
Register Senior Citizens	Seniors can be identified and tracked in farebox	✓	✓	✓
Register Persons with Disabilities	Identifies persons with disabilities	✓	✓	✓
Compatibility with existing technology	System is compatible with dominant, existing fare collection technology, or technology can easily be upgraded		✓	✓
Compatibility with future technologies	Permits integration with future fare collection technologies, including smart card		✓	✓
Creates data system	Record planning data (date, time, route, user type, etc.)		✓	✓
Internal consistency	Can be used by all modes within a single transit system, including at unmanned locations	✓		✓
Facilitates easy access for beneficiaries	Card is easily acquired, renewed, and maintained	✓	✓	✓
Ease of use	Can be easily used by people with physical constraints	✓		✓
Ease of implementation	Is easy to implement statewide		✓	✓
Accountability	Facilities high quality tracking of ridership		✓	
Offers fraud protection	Links card holder to user; Limits transferability		✓	✓
Cost of participation	Low or no direct costs to program beneficiaries	✓	✓	✓
Cost-effective: Implementation	Is cost-effective statewide to implement		✓	✓
Cost-effective: Program management	Is cost-effective statewide to manage		✓	✓
Simplifies program and creates efficiencies	Increases efficiency of service delivery	✓	✓	✓

Source: WSA

5.0 Development of Alternatives

Building on the information collected and analyzed in the first three sections of this report, the Study Team identified and developed alternatives for a statewide identification system. The initial set of five alternatives included the following:

1. Status Quo/Existing Systems
2. Locally issued/centrally processed ID card
3. Driver's License/State Identification Card
4. Hybrid Driver's License/State ID card for Seniors and Locally Issued Identification Card for Persons with Disabilities
5. Smart Card Technology

The primary features of these initial alternatives are shown in **Table 6**.

Table 6: Initial Alternatives

Alternative	Key Elements
1. Status Quo/Continued use of existing system	▪ Card designed by Commonwealth and issued by local transit operators ▪ Does not have photo ID ▪ Free and reduced fare is obtained by flashing card to driver ▪ ID cards are not and cannot be read by fare box ▪ Integration with disabled half-fare program unlikely ▪ Continued use of Medicare card at point of sale
2. Locally issued/centrally processed ID Card	▪ Use magnetic stripe technology to encode eligibility ▪ Card designed by Commonwealth ▪ Application collected by local transit agencies ▪ Cards printed and distributed at central card processing location ▪ Requires beneficiary to swipe card in fare box ▪ Free fare is verified in most fare boxes using magnetic stripe technology ▪ Fare box able to read ID cards and may record date and time of trip ▪ Integration with disabled half-fare program likely
3. Driver's License/State Identification System	▪ Use existing driver's license/state identification cards design and fulfillment processes, including magnetic strip encoding ▪ Card has photo ID ▪ Requires beneficiary to swipe card in fare box ▪ Free fare is verified in fare box using magnetic stripe technology ▪ Fare box able to read ID cards and may record date and time of trip ▪ Integration with disabled half-fare program possible
4. Hybrid Driver's License/State Identification System for Free Transit Program and Locally Issued Identification Card for Disabled Half-fare program	▪ For people with permanent eligibility, use driver's license/state identification card ▪ For people with temporary eligibility, issue temporary transit cards ▪ Temporary use cards designed by Commonwealth, issued by local agencies ▪ Permanent cards have photo ID; temporary cards do not have photo ID ▪ Fare boxes able to read permanent and temporary cards ▪ Fare boxes may be able to record date and time of trip ▪ Requires beneficiary to swipe card in fare box

5. Smart Card Technology	▪ Use smart card technology ▪ Commonwealth determines key features and format of card ▪ Application processed by transit authority ▪ Card designed and issued by central clearing house ▪ Card has photo ID ▪ Requires beneficiary to hold card near fare box (contactless) ▪ Free fare is verified in fare box using smart card technology ▪ All systems will require card readers ▪ New card readers can record date and time of trip ▪ Can be integrated with disabled half-fare program

Source: WSA Study Team

5.1 Issues Affecting Feasibility and Performance

As the Study Team screened the initial alternatives against the evaluation matrix, three issues emerged that affect the feasibility and performance of the alternatives. We determined that these issues needed to be considered in more detail and discussed with the Steering Committee. They include:

- Differences between Seniors and Persons with Disabilities
- Use of the Medicare Card
- Smart Card Technology

An overview of each issue is provided in the following sections. A final section presents the results of the Steering Committee and Study Team discussions and how issues were resolved and their impact on alternative development.

5.1.1 Seniors and Persons with Disabilities

Research objectives for the Study are focused on recommending an identification system for senior citizens participating in the Free Transit Program. A secondary objective was to include persons with disabilities, who participate in the Half Fare Program. The two groups, senior citizens, which comprise the vast majority of the two markets, and citizens with disabilities under the age of 65, represent distinct markets for three primary reasons:

- Senior citizens are permanently eligible for the Free Transit Program while persons with disabilities may be either permanently or temporarily eligible for the Half Fare Program;

- Transit agencies record trips made as part of the Free Transit Program and report this information to PennDOT so that fares may be reimbursed. Trips made as part of the Half Fare Program (for persons with disabilities) may be recorded, but the trips are not reimbursed, thus making reporting requirements from a statewide perspective less stringent; and

- Senior citizens require only an identification system because no fares are collected from this group. Systems for persons with disabilities, on the other hand, require both identification and fare collection (half-fare).

These distinctions mean that in some cases, a satisfactory solution for senior citizen identification may or may not be technically feasible for participants with disabilities, especially those with a temporary disability. Having a single solution for the two groups, therefore, has the potential to constrain the set of feasible alternatives. A fundamental issue facing the Study Team, therefore, is the relative appeal of a solution that is only applicable to senior citizens against potentially more cumbersome solutions that are able to incorporate customers with disabilities as well.

5.1.2 Use of the Medicare Card

Current practice among many transit operators in the Commonwealth is to accept Medicare cards from seniors at the point of sale for access to the Free Transit Program. Although not necessarily preferred by most transit operators, this practice allows seniors to take advantage of the Free Transit Program without registering with the transit agency. This is a significant advantage for some travelers, especially infrequent riders. Under the current system, allowing the use of Medicare cards does not significantly affect trip recording systems.

Several of the proposed options, however, introduce controls to improve accountability. Such options function best when the identification systems are limited to those that work within the recommended technology. Trips made by participants with cards outside of such systems (such as a Medicaid card) would require a separate, manual tracking mechanism, thereby undermining the effectiveness of the tracking system.

The Study Team also understands the federal regulations requiring transit operators to accept Medicare cards as proof of eligibility, but not necessarily as proof of identity in permitting elderly and customers with disabilities to ride for half-fare. We also recognize that discontinuing the use of Medicare cards as a valid form of ID at the point of sale may negatively affect a portion of current participants as well as future occasional riders. In order to balance the goals of recording trips electronically and meeting the needs of occasional riders, we recommend that as electronic trip recording is introduced, travelers may use the Medicare card at the point of sale to receive the half-fare discount but not a free fare. Transit agencies may still accept the Medicare card as a valid form of ID when registering for the Free Transit Program, but not at the point of sale.

By not accepting the Medicare card as valid ID for the Free Transit Program at the point of sale, we work towards the goals of recording FTP trips electronically and reducing fraud. We successfully reduce fraud by reducing opportunities for Medicare card holders who are less than 65 years old from using just their Medicare card to access the Free Transit Program. On the other hand, all Medicare card holders, including out of state and casual transit riders, can use fixed route services for half-fare without applying for any additional ID cards or permits.

5.1.3 Smart Card Technology

The most significant issue underlying development of a long-term strategy for a statewide identification system in Pennsylvania is smart card technology. The Study Team anticipates that smart card technology will ultimately provide the greatest benefits for all stakeholders both in the Free and Half Fare Programs. These benefits arise from the following:

- Smart card technology can be programmed to accommodate a multitude of identification and fare collection combinations, such as off-peak free and reduced fare requirements, thus integrating all transit users into the same fare collection system;
- PennDOT and transit properties would benefit through improved rider tracking, data collection and reporting; and
- The contactless feature of smart cards would help senior citizens and persons with disabilities through the convenience of a card that does need to be manually manipulated in any way or, in some cases, even taken out of wallets, purses or pockets.

At the same time, program benefits are not anticipated to be sufficient to justify the costs associated with implementing smart card technology purely for the FTP stakeholders. In addition, even when transit systems implement smart card technology, customers will still be able to pay cash fares. Accordingly, provisions must be made for customers with disabilities to use a smart card for identification or pay with cash.

5.1.4 Recommendations

The Study Team discussed these issues with the Steering Committee and considered potential implications of different solutions. In the case of first two issues - accommodating both seniors and persons with disabilities and use of the Medicare card - the Study Team opted to acknowledge but not be constrained by these concerns. We also agreed to re-examine these issues in the more detailed discussions conducted as part of the market research.

In terms of smart card technology, however, the Study Team recognized that there are important unknown factors that can not be answered in the course of this study, primarily costs and the implementation timeframes of transit operators. Given this, the Study Team made the following determinations:

- Short-to-medium term options (i.e., not including smart card technology) should be explored for their ability to meet the needs of the Free and Half Fare Programs;
- Identification systems should be evaluated for their potential to be compatible with future smart card technologies;

- Options that require extensive retrofitting of fare collection systems, especially at SEPTA and PAT, should be deferred until smart cards are introduced at these systems;

- Future identification systems may require features to ensure compatibility among transit organizations; and

- Close communication between PennDOT and the two largest transit operators is essential so that future implementation of smart card systems occurs smoothly. A particular concern is cross-compatibility between PAT and SEPTA since it is desirable that the type of senior identification system ultimately selected be universally acceptable across the Commonwealth.

5.2 Development of Final Alternatives

Based on the preceding analysis, the Study Team developed a set of four alternatives determined to be feasible in the short-to-medium term and warranted a more detailed examination. A fifth longer-term strategy, smart card technology, was also carried forward, although it is not included in this preliminary list because, as discussed, smart card technology is not currently being used in the Commonwealth.

The four short-to-medium term options for further consideration are shown in **Figure 6** and include:

- Status quo – no change to the current system (**Alternative 1 - Status Quo: Commonwealth ID Card**);

- Status quo but adding a photo ID to the card (**Alternative 2 – Commonwealth ID card with Photo ID**);

- Issue cards locally by transit operators but process cards so that they can be printed with photo IDs and magnetic stripe technology (**Alternative 3 – Magnetically Encoded Commonwealth ID Card**); and

- Use cards issued by the existing driver's license/state ID system as access cards, either as a flash card or taking advantage of driver's license and State ID cards current magnetic stripe technology (**Alternative 4 – State Driver's License/State ID Card**).

An additional option that was discussed but not included in the final set of options was to develop a central processing center whereby local transit operators could send application materials to a central facility for card processing. While similar processes are currently in use in other parts of the country, the technology required to produce photo ID cards, even on cards encoded with a magnetic stripe is relatively inexpensive and simple to use, thus limiting the benefits of outsourcing. The alternative also required that applicants wait for their card to be mailed to them, consequently requiring issuance of temporary cards and significantly complicating the program.

The Study Team also considered a hybrid option that relied on the Driver's License and State Identification System for seniors and persons with permanent disabilities, but required transit operators to issue cards locally for individuals with temporary disabilities. The primary advantage of this system is that it includes a process to accommodate individuals with a temporary disability. Although the hybrid solution was not carried forward, the option of setting up a sub-system for individuals with temporary disabilities was retained.

5.3 Evaluation of the Alternatives

Prior to carrying out the evaluation, however, the Study Team prepared more detailed implementation plans for each alternative. Implementation plans were necessary as a first step, so that the Study Team could sketch out how each option might operate, as well as ascertain associated institutional, facility and outreach requirements. The process also helped identify otherwise unanticipated strengths and weaknesses for each alternative. **Figures 7 – 10** show a flow diagram of how each of the final alternatives would work. The implementation plans are included with this report as **Appendix E – Draft Implementation Plans: Initial Alternatives**.

Working from the implementation plans, the Study Team was able to carry out a detailed evaluation process. This process included comparing program benefits and costs and presenting each alternative to stakeholder groups in focus group discussions. The individual alternatives are presented in **Table 7** together with a summary of key advantages and disadvantages. More information on the evaluation process and results for these steps are described in the following sections.

	Identification at Fare box	Investment Required	Key Benefits (over current system)
Alternative 1- Status Quo: Commonwealth ID Card	Flash Card	None	None
Alternative 2- Commonwealth ID Card with Photo ID	Flash Card with Photo	Card Processing	Links Card with User, Improves Card Security
Magnetically Encoded			
Alternative 3- Magnetically Encoded Commonwealth ID Card	Swipe or Flash Card with Photo	Card Processing, Fare box Readers	Links Card with User, Allows Electronic Tracking, Improves Card Security
Alternative 4- State Driver's License/ State ID Card	Swipe or Flash Card with Photo	Card Processing, Fare box Readers	Links Card with User, Allows Electronic Tracking, Improves Card Security, Improves Program Accessibility

Figure 6: Short-to-Medium Term Options

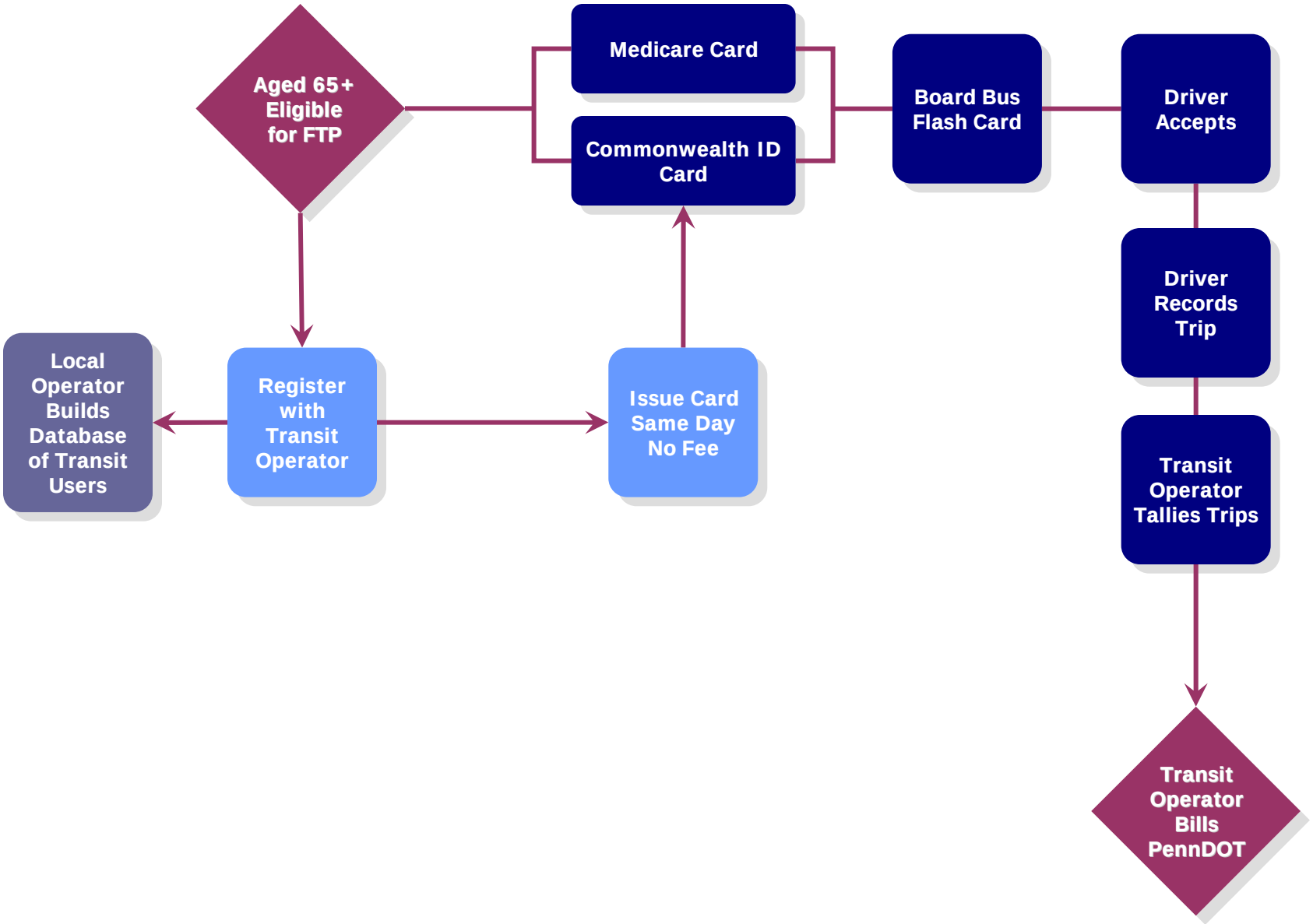

Figure 7: Alternative 1- Status Quo-Commonwealth ID Card

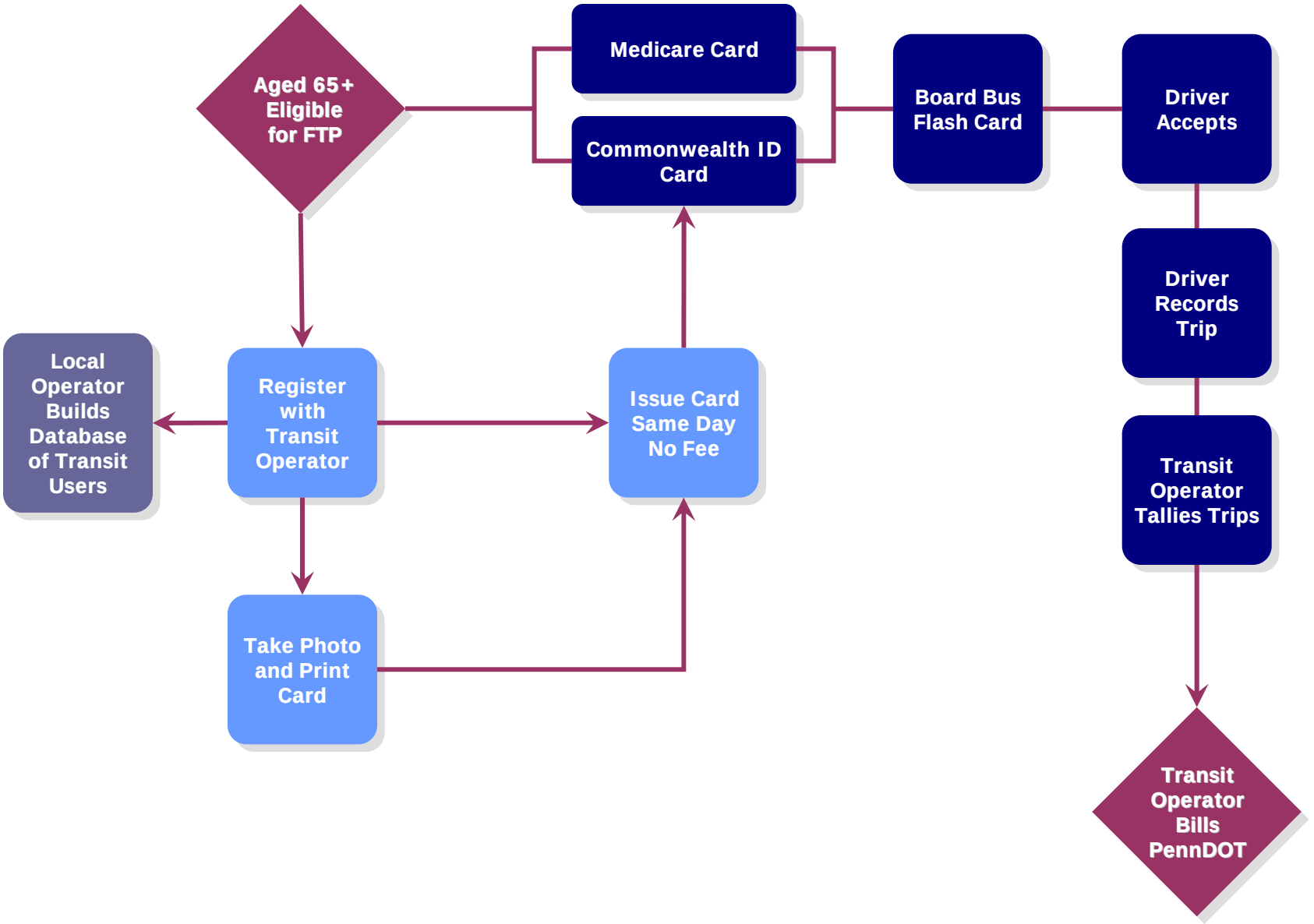

Figure 8: Alternative 2- Commonwealth ID Card with Photo ID

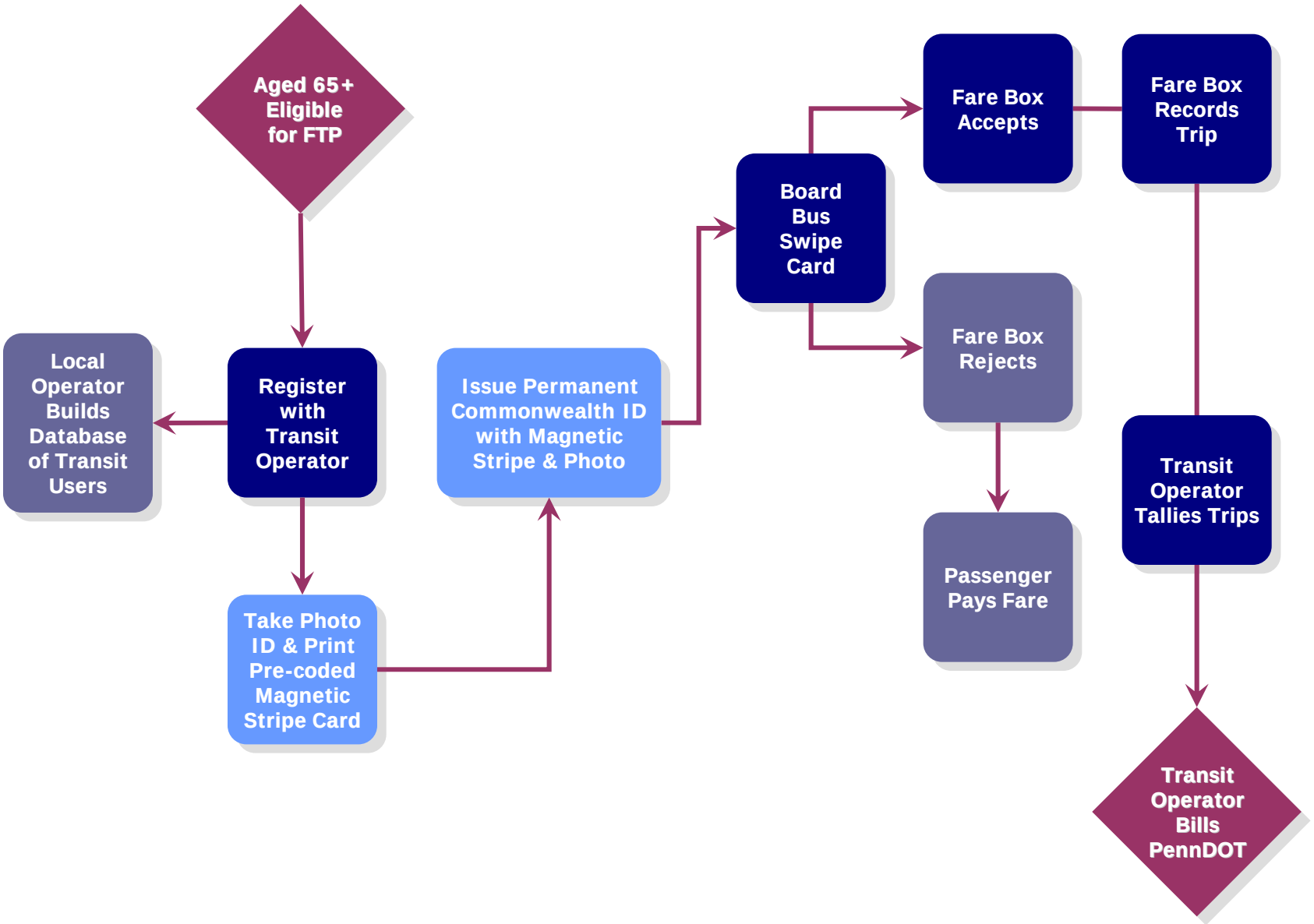

Figure 9: Alternative 3- Magnetically Encoded Commonwealth ID Card

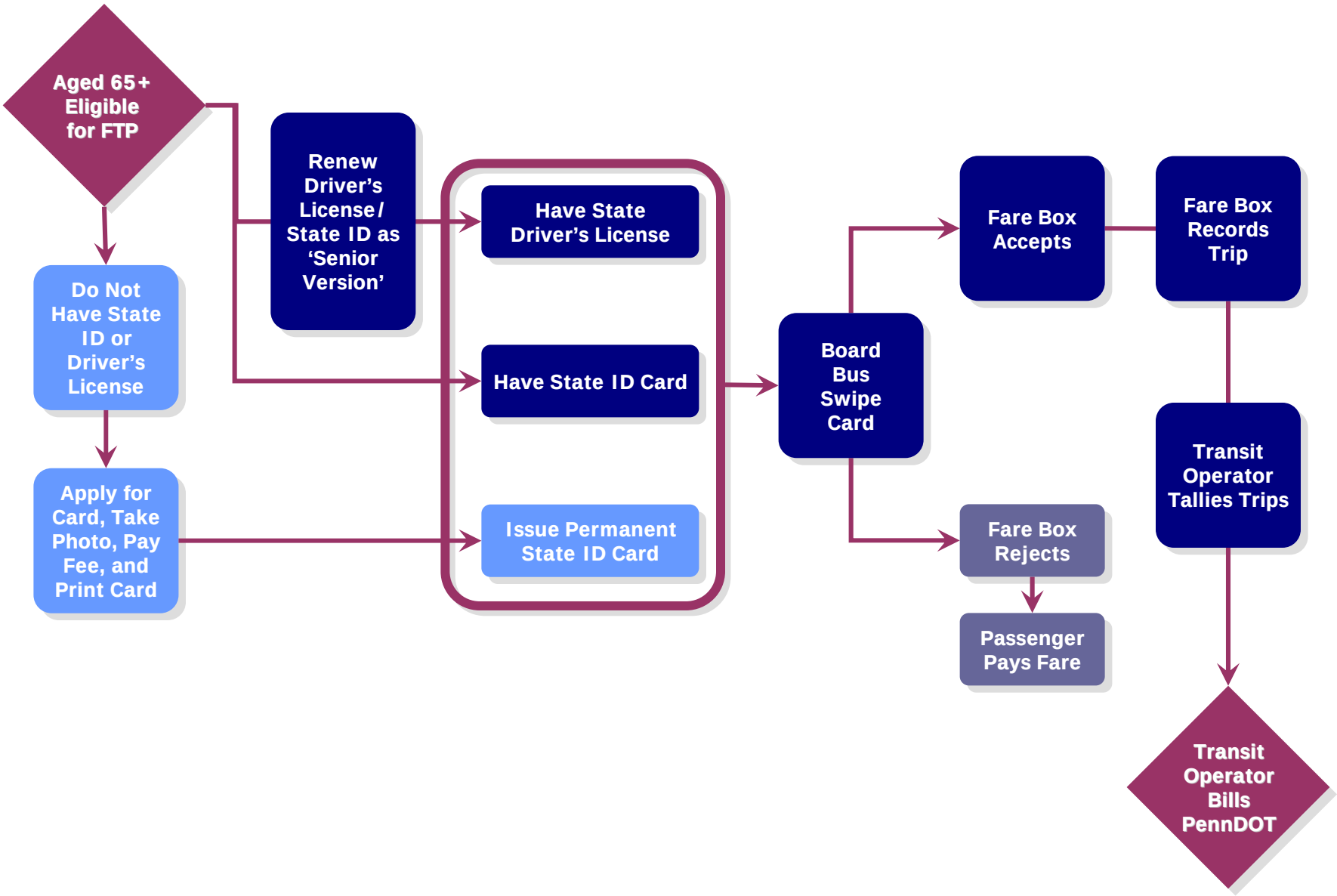

Figure 10: Alternative 4- State Driver's License / State ID Card

Table 7: Preliminary Evaluation of Short-to-Medium Term Options

	Alternative 1: Status Quo: Commonwealth ID Card	Alternative 2: Commonwealth ID Card with Photo	Alternative 3: Magnetically Encoded Commonwealth ID Card	Alternative 4: Driver's License and State ID Card
Advantages/Benefits				
PennDOT	Inexpensive	Inexpensive Links card to user/Improves card security	Electronic tracking and reporting of trips; Improved auditability; Increased security;	Electronic tracking and recording of trips; Improved auditability; Increased security
Seniors and Persons with Disabilities	Process unchanged	Process nearly unchanged	Process nearly unchanged	Most already have card
Transit Operators	Inexpensive Easy to administer	Inexpensive Easy to administer Improves security	Electronic recording of trips; Improves security; Helps create user database	Reduced administration (don't issue ID cards); Improves security; Helps create user database
Disadvantages/Costs				
PennDOT	System lacks accountability Lacks security	System lacks accountability	More expensive (who pays?)	Use of driver's license in fare boxes may impact longevity of card; May not be forward compatible; May require issuing new color coding
Seniors and Persons with Disabilities	Lacks security	Requires taking photo Improves card security	Requires taking photo; More time consuming to get ID card (take photo); Must swipe card in reader – not accessible to all seniors and persons with disabilities	Fee if you don't have card; Must swipe card in reader; Requires renewing card; May require new card
Transit Operators	Driver-passenger interaction Unworkable at unmanned stations Lacks security Does not facilitate market understanding or data	Increased time to issue cards Driver-passenger interaction Unworkable at unmanned stations Does not facilitate market understanding or data	Increased time to issue cards	Does not create local database of users

5.3.1 Cost-Benefit Analysis

The Study Team prepared a cost-benefit analysis on the four selected alternatives. Based on this analysis, the Study Team determined that Alternatives 3 and 4 would best meet the objectives of the project, at a capital cost of $4.4 to $5.2 million, respectively. The full cost benefit analysis is included with this report as **Appendix F – Cost Benefit Analysis of Alternatives;** the highlights are shown in **Table 8**.

Table 8: Comparison of Alternatives

Alternative	Key Attributes	Cost
Alternative 1 – Status Quo: Commonwealth ID Card	▪ No impact on riders ▪ No improvement to accounting for trips by seniors and persons with disabilities	Capital cost = $0
Alternative 2 – Commonwealth ID Card with Photo ID	▪ Requires all existing senior and riders with disabilities to obtain new ID cards ▪ Requires issuance of approximately 500,000 new IDs by transit systems ▪ Improves fraud protection ▪ No improvement to accounting for trips by seniors and persons with disabilities	Capital cost - $733,000
Alternative 3 – Magnetically Encoded Commonwealth ID	▪ Requires all existing senior and riders with disabilities to obtain new ID cards ▪ Requires issuance of approximately 500,000 new IDs by transit systems ▪ Requires modification and/or installation of new equipment on all transit vehicles and SEPTA subway stations ▪ Greatly improves fraud protection ▪ Greatly improves accounting for trips by seniors and the persons with disabilities	Capital cost: $5.2 million
Alternative 4 – State Driver's License/State ID Card	▪ No impact for approximately 91% of riders; 9% would need to acquire a State ID ▪ Shifts responsibility for issuance of IDs from transit systems to BDL ▪ Requires issuance of approximately 30,000 new IDs by BDL ▪ Requires modification and/or installation of new equipment on all transit vehicles and SEPTA subway stations ▪ Greatly improves fraud protection ▪ Greatly improves accounting for trips by seniors and persons with disabilities	Capital Cost: $4.4 million

Source: WSA Study Team

5.3.2 Evaluation in the Market Place (Focus Group Results)

The Study Team presented each of the four alternatives to groups of stakeholders in facilitated focus group discussions. The stakeholder groups included seniors, persons with disabilities and representatives from transit agencies. Researchers presented each alternative evenly, so that participants were able to judge and react to each alternative without influence from the Study Team. A full report on the market research is included as **Appendix G – Market Research Results**. After reviewing the discussions from all

six focus groups, the Study Team summarized their comments in terms of alternatives development:

- **Persons with Disabilities:** Persons with disabilities represent a smaller market as compared with seniors. Persons with a temporary disability are a small portion of all persons with disabilities, therefore alternatives may be feasible even if they are not easily applicable to persons with temporary disabilities.

- **Program Fraud and Abuse-** Nearly all participants in the focus groups noted the lack of security associated with the Commonwealth ID cards, both for seniors and persons with disabilities and in terms of reproducing and tracking the cards. Accordingly, there was nearly universal agreement that card security should be improved, even if it is just simple measures such as adding a photo, laminating the card or having a statewide tracking number.

- **Universal Access -** The applicability of the Commonwealth ID card across all transit systems in Pennsylvania is an essential element of the program. In practice, however, few seniors take advantage of this benefit. Having a universal card is a convenience for the transit operators in terms of reducing the number of passes a driver needs to recognize as much as it is for seniors. It may be feasible, therefore, for agencies to accept cards with a special program marking or logo, even if other parts of the cards are not common across Pennsylvania.

- **Medicare Cards -** The use of Medicare cards at the point of sale can be discontinued. While a public education would be required to phase out acceptance of the Medicare card, the Study Team anticipates that it would not cause significant hardships on existing riders and offers potential benefits to the transit agencies.

- **Magnetic Swipe Technology -** While magnetic swipe technology has merits in terms of existing, proven technology, the actual physical requirements associated with swiping a card may mean it is definitely inappropriate technology for certain persons with disabilities and is likely inappropriate for some senior citizens. Although many people in each of the populations could easily use swipe cards, it is unlikely that all persons in either population could easily handle swiping passes.

- **Driver's Licenses and State ID Cards:** Seniors and many transit agencies (including SEPTA) support the use of driver's licenses and State ID cards as acceptable forms of identification. This was true even if the driver's licenses were issued as "senior" cards with a different color banner. An example of a potential senior version of the Pennsylvania Driver's License is included as **Figure 11**. Persons with disabilities, however, do not support this option.

Figure 11: Existing Driver's License and Example of Potential Senior Version

- **Smart Card Technology:** Smart cards represent an attractive technology for all stakeholders in the Free and Half Fare Programs; contactless cards would be easy for both populations to physically use; agencies can control card use by 'turning off' out of date cards, and the technology likely offers the greatest quality and quantity of information about riders. Smart card technology is still considered by many to be a long term strategy. Costs and reliability, therefore, are uncertain.

- **Tri-mode cards -** It is possible to have a multi-media flexible ID card that could work with the three main technologies under consideration (flash, magnetic stripe and smart card). The idea that a flexible AND universal card can be created that works with a multitude of fare collection systems is appealing because it allows the ID card to follow fare collection technology. Flexible, multi-media identification cards may be an attractive option, especially for the minority of people who use more than one transit system.

Figure 12: Example of a Multiple Mode Smart Card (DataCard Group)

- **Electronic Recording of Trips** - By most accounts there is very little fraud and abuse in the recording of trips; most individuals expressed greater concern about abuse associated with the actual, namely that the cards are easily reproduced and transferred. Given that requiring seniors and persons with disabilities to swipe cards may not be feasible, it may be prudent to continue to accept flash passes from riders.

- **Marketing and Outreach:** Potential changes will need to be effectively marketed to inform riders of the changes. In addition, marketing and outreach efforts should be designed to educate riders about changes and provide opportunities to attract new riders.

5.3.3 Final Refinement of Alternatives

As a result of opinions and information collected during the focus group research, the Study Team determined it was important to revisit some of the baseline assumptions in the program, namely:

- Was electronic recording of the trips essential; and

- Did the card need to provide universal access to all systems in Pennsylvania, and in particular did the card need to be a standard format.

These questions, as they apply to alternative development, are laid out in **Figure 13.**

Electronic Recording of Trips

The Study Team re-examined the importance of electronic trip recording for two reasons. First, during discussions with seniors and persons with disabilities these populations expressed concern about swiping cards in a card reader. Indeed, it was apparent that some segments of both populations would be physically unable to or face considerable challenges if asked to swipe a card in reader. In the short-run, therefore, if magnetic stripe technology is recommended, a final alternative would need to allow for some portions of the population to flash rather than swipe their card.

Second, one of the motivations for swiping cards is to record trip-making electronically as a strategy to improve program accountability and reduce fraud. Input during the market research, however, suggested that while some stakeholders expressed concerns about fraud, these concerns were primarily related to the lack of security associated with the cards rather than reporting systems, specifically that the cards can be easily reproduced and transferred.

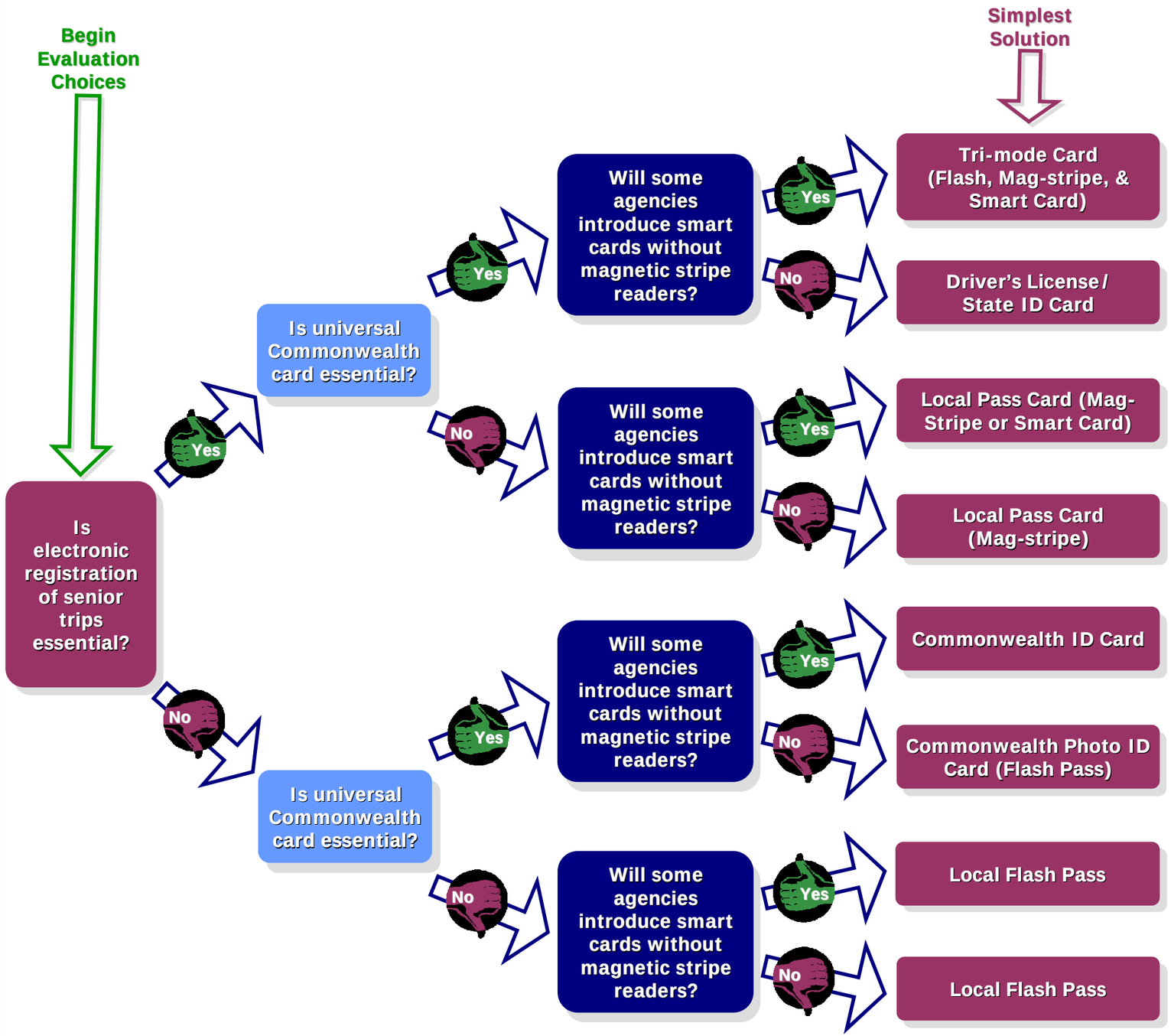

Figure 13: Senior Citizen Identification Alternatives Flowchart

Recognizing that the recommended strategy would include short-to-medium solutions as well as longer term solutions, the Study Team felt it was worthwhile considering postponing requiring electronic recording of trips. These ideas were presented to and discussed with the Steering Committee. Ultimately, the Steering Committee together with the Study Team agreed that moving towards electronic recording of the trips was essential, even if it is phased in over time. Accordingly, the Study Team recognized that all alternatives may include a flash card option in the short-term, but that the preferred strategy should include strategies to move the program towards electronic recording of trips.

Universal Access

The market research also led the Study Team to reconsider the importance of a single format card, primarily because only a small minority of stakeholders were aware their card worked across the State, thus suggesting that few seniors and persons with disabilities actually use their Commonwealth Transit ID outside of their home system. Thus, members of the Study Team wanted to examine the potential of affixing an easily recognizable logo or sticker to existing identification cards such as State Driver's licenses or ID cards, or local transit passes.

The Study Team discussed this issue with the Steering Committee, which concluded that universal access was indeed an essential element of the program and that a standard card format should be available across the Commonwealth. In addition, at least one of the Steering Committee members noted that future generations of 'seniors' are anticipated to be increasingly mobile and thus, the importance of this feature may increase over time. Thus, affixing a logo or sticker to an existing identification card is not desirable.

6.0 The Preferred Strategy

The Study Team reconsidered the data, information and dialogue relating to the development of identification systems for seniors and persons with disabilities in order to identify a preferred strategy. As part of this process, we reviewed the original research objectives to make sure the recommendations would fulfill the original intention of the project. The original project goals were to:

- Evaluate the current state of practice regarding identifying senior citizens and persons with disabilities, especially in transit markets;
- Recommend a strategy for the Commonwealth of Pennsylvania to develop a statewide identification method for free and half-fare transit travel; and
- Recommend a future direction for using an electronic format to capture transit use among these populations.

With these objectives in mind and building on data collected through the course of this Study, the Study Team recommends a phased, flexible-technology, hybrid strategy ("PennTransit ID Card") that builds on existing technology in the short-term and allows flexibility to incorporate new technology as it becomes available in Pennsylvania over time.

The hybrid strategy retains the card's universal appearance statewide but replaces it with a plastic photo ID card. The card will likely have a new "look" or "brand", but the primary objective of the plastic card will be to make it more difficult to reproduce and transfer. At the same time the strategy permits use of the State driver's license/State ID card, at least in the interim, to encourage use in the program. The recommended strategy will also initiate the process of recording trips electronically at the larger transit systems; both the new PennTransit card and the driver's license/State ID card may be swiped in a reader.

The preferred strategy is presented in the following text according to three elements:

- An overview of the preferred strategy, including an implementation timeline;
- A recommended implementation strategy, including suggestions for pilot programs; and
- A cost estimate.

6.1 Overview of the Preferred Strategy

The strategy for implementing the PennTransit ID Card includes the following:

- Adopt a new statewide transit identification card for seniors participating in the Free Transit Program and persons with disabilities participating in the Half Fare Program with the following features:
  - printed on hard plastic;
  - include a photo ID;
  - contain a magnetically encoded stripe on the back;
  - in the short-to-medium term the card can be used as a flash card or where available and appropriate, swiped in a card reader; and
  - in the longer-term the card may be updated to include a smart card chip if and when systems are implemented in Pennsylvania.

- Issue a special version of the Driver's License or State ID card and permit use of this card to access the Free Transit Program. This card may be shown (flashed) to the transit operator/driver or used in a swipe reader as appropriate. Use of the Driver's License/State ID card may be phased out when smart card technology becomes widespread, or Driver's licenses and State ID cards may be embedded with smart card chip.

Key features of the preferred strategy are laid out in **Table 9.**

Table 9: Key Features of Preferred Strategy

Time Frame	Technology	Key Features
Short-to-Medium Term	■ Dual-mode ID cards. ■ Photo ID cards with magnetic stripe technology. ■ Can be used as flash cards or swiped in readers, where appropriate.	■ Offer seniors and persons with disability choice of: ■ New plastic "credit card sized" transit ID cards encoded with magnetic stripe – PennTransit ID; or ■ "Senior" and "Disabled" version of State Driver's License and State ID cards. ■ Facilitates recording of about 50 percent of all senior trips.
Medium-Term	■ Phase in use of tri-mode ID cards. ■ Photo ID cards with magnetic stripe and smart card technology. ■ Can be used as flash cards, swiped in magnetic card readers, or smart card readers, as appropriate.	■ In locations where smart card technology is available, issue PennTransit ID as tri-mode card. ■ Continue use of PennTransit ID or State Driver's License/State ID card, as desired and appropriate. ■ Likely facilitates recording of about 75 percent of all senior trips in short term.
Long-Term	■ Full implementation of smart card ID cards. ■ Retain Photo ID card with potential to register seniors and/or persons with disability	■ Issue PennTransit ID card as dual-mode card (photo ID and smart card). ■ May consider equipping Driver's License/State ID with smart card chip – otherwise, discontinue acceptance of cards in program. ■ Likely facilitates recording of 90 percent of all senior trips.

Source: WSA Study Team

In addition, as discussed, the preferred strategy will be phased in over time in order to allow the system to respond to market changes in fare collection technology. **Figure 14** highlights the implementation process; the following text provides more detail on how program features are implemented over the short, medium and longer term.

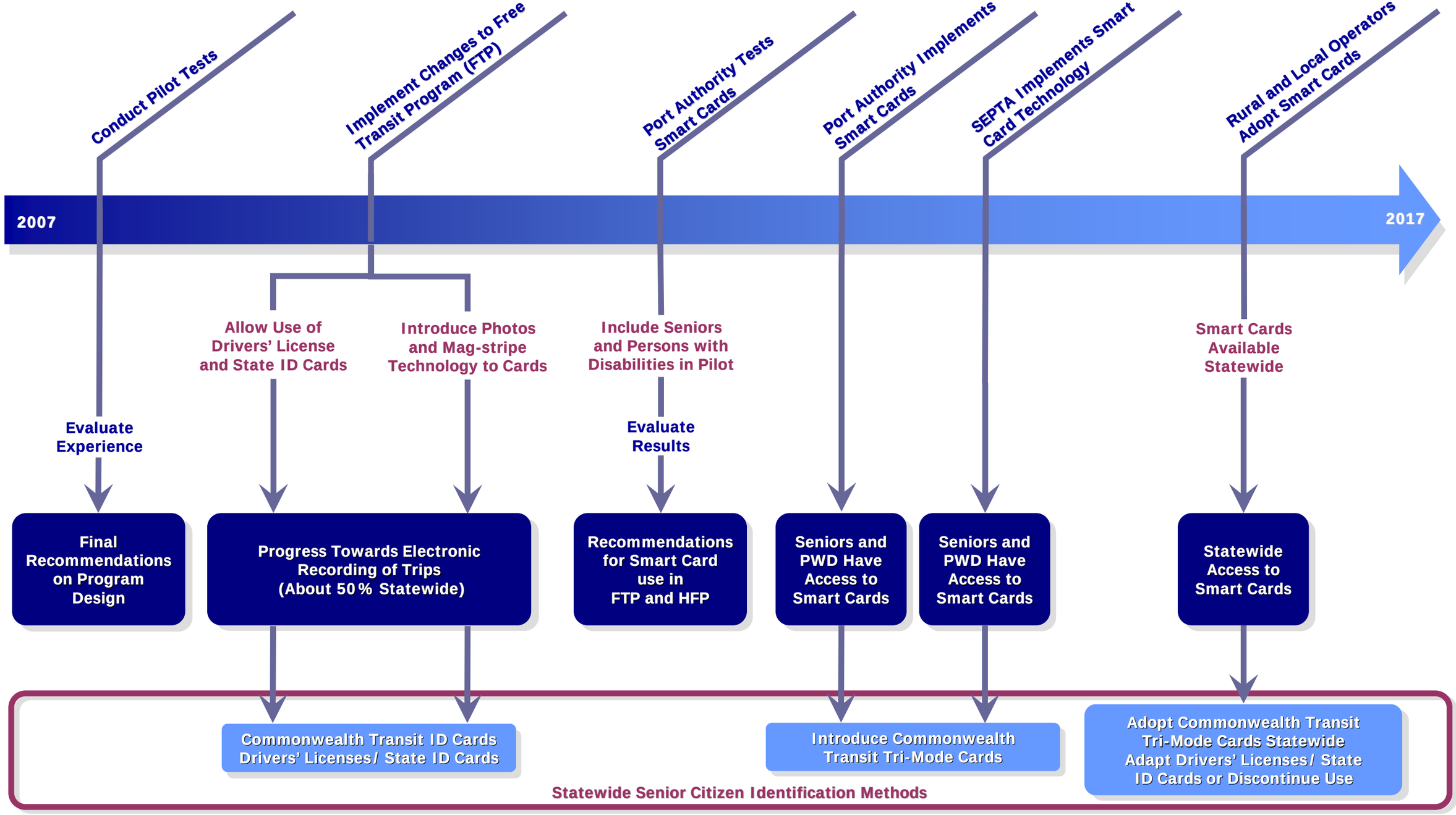

Figure 14: Preferred Strategy Implementation Timeline

Phase I: Short-Term Implementation

In the short-term preferred strategy, two types of photos IDs would be accepted for seniors using the Free Transit Program:

1. Pennsylvania Driver's licenses and the Pennsylvania Commonwealth Identification Card ("State ID"), and
2. New dual-mode PennTransit ID, which would replace the existing Commonwealth Transit ID.

The use of other forms of ID, including Medicare cards, would be discontinued, definitely as a proof of eligibility at the point of transaction for the FTP. Discontinued use of the Medicare card at the point of transaction for the half fare program is also recommended.

Persons with disabilities would also be issued new PennTransit ID ("PennTransit ID"), but would not have the option to use driver's licenses or State ID cards. The decision not to include persons with disabilities is based on the strong negative response when the idea was discussed with this population. In addition, creating a disabled version of the driver's license would be challenging for the Bureau of Driver Licensing to implement.

As appropriate, individuals using transit systems that have magnetic strip readers would be requested to swipe their PennTransit ID, driver's license or State ID card in the reader when boarding a service. Our research suggests that fare box swipe readers will be able to read driver licenses and State ID cards as well as transit passes, despite differences in card thickness. We also propose to test this capability in the demonstration projects outlined later in this chapter.

Based on our analysis, once magnetic stripe cards are available, PennDOT can expect electronic recording of about half of all senior trips, most of which will be acquired via the SEPTA system. An overview of program objectives achieved in the short-term is shown in **Table 10**.

Table 10: Program Objectives Accomplished in Short-Term

Objective	Achieved
Encourage program use	Yes
Simple to understand, access and use	Yes
Cost effective	Yes
Adaptable to future technologies	Yes
Functional and accessible to all transit operators	Yes
Records and track usage	Limited
Permits access at unmanned locations	Yes (if mag stripe equipped)
Improves understanding of how seniors and persons with disabilities travel	No
Improves marketing capabilities	Limited
Allows for universal access and use	Yes

Source: WSA Study Team

Phase II: Medium-Term Implementation

In the medium term, we anticipate that the transit agencies will use a combination of flash card, magnetic stripe and smart card technologies. As smart card technology comes on-line, seniors and persons with disabilities living in or near the system, will be issued a tri-mode PennTransit ID card with a photo ID, a magnetically encoded stripe and a smart card chip, allowing seniors to interface with their local smart card system as well as travel on systems with magnetic swipe readers as well as those still using flash cards. Frequent visitors to systems with smart card technology may also get a tri-mode card; infrequent visitors may merely show their ID card. Driver's licenses and State ID cards would continue to be valid for use as either as magnetic stripe or flash card.

If smart card technology is adopted at a rate slower than anticipated, our proposed strategy retains the option of wider scale implementation of magnetic stripe technology. Under this scenario, PennDOT could support the supply of low-cost, hand-held personal digital assistants (PDAs) to operators participating in the program who do not have the capability to record trips. This would enhance the recording of trips statewide, without requiring major equipment upgrades.

In either case, as shown in **Table 11**, the strategy would result in significant progress towards program goals.

Table 11: Program Objectives Accomplished in Medium-Term

Objective	Achieved
Encourage program use	Yes
Simple to understand, access and use	Yes
Cost effective	Yes
Adaptable to future technologies	Yes
Functional and accessible to all transit operators	Yes
Records and track usage	Improved
Permits access at unmanned locations	Yes (if mag stripe equipped)
Improves understanding of how seniors and persons with disabilities travel	Limited
Improves marketing capabilities	Improved
Allows for universal access and use	Yes

Source: WSA Study Team

Phase III: Longer-Term Implementation

In the longer term, the Study Team anticipates the majority of transit agencies in the Commonwealth will adopt smart card technology, allowing for the full program objectives to be achieved (**Table 12**). At this time, the tri-mode card may become a dual-mode card (but with flash and smart card options) unless there is a compelling reason to retain the magnetic stripe. At this time, driver's licenses and State ID cards may be equipped with a smart chip or no longer accepted as valid ID for the program.

Table 12: Program Objectives Accomplished in Long-Term

Objective	Achieved
Encourage program use	Yes
Simple to understand, access and use	Yes
Cost effective	Yes
Adaptable to future technologies	Yes
Functional and accessible to all transit operators	Yes
Records and track usage	Yes
Permits access at unmanned locations	Yes
Improves understanding of how seniors and persons with disabilities travel	Yes
Improves marketing capabilities	Yes
Allows for universal access and use	Yes

Source: WSA Study Team

6.2 Implementation Strategies and Recommendations

The implementation plan represents our proposed pathway to transition from the current identification system to the preferred strategy. A detailed implementation plan is included to the report as **Appendix H - Implementation Plan for the Preferred Strategy**.

Recognizing that the solution represents a phased approach, implementation will likewise be incremental. An implementation matrix highlighting key steps to be taken for each implementation phase and showing implementation responsibility is included as **Table 13**. The matrix also includes a recommended timeframe; we feel it is essential for PennDOT to move on some action steps, while others are negotiable. We recommend the following steps in the short term:

1. PennDOT FTP staff gets engaged in smart card development issues and track developments as they pertain to future FTP goals and requirements;
2. Initiate the process to issue PennTransit card to improve card security and reduce fraud;
3. Convene a task force to track key issues and oversee policy development to support PennTransit card development and commence option to use driver's license and State ID card as valid form of FTP ID; and
4. Conduct Pilot Programs to test and refine key technologies and concepts.

Table 13: Implementation Matrix

Implementation Action Steps	Responsibility	Time Frame
Project Planning		
1. Convene Implementation Task Force	PennDOT	Within 3- 6 months
2. Update/revise program regulations	PennDOT in consultation with Task Force	3-6 months
3. Monitor smart card development statewide	PennDOT	Immediate
Conduct Demonstration/Pilot Programs		
1. Develop demonstration (pilot) project specifications	Task Force	Within 6 months
2. Award pilots, oversee project implementation	PennDOT	12-18 months
3. Evaluate pilot projects	PennDOT	18-24 months
Project Phase 1: Short-Term Implementation (Photo ID/magnetic stripe card)		
1. Develop new Statewide Transit ID Card	Task Force	3-6 months
2. Determine specifications for card, photo-taking equipment and card production	PennDOT	3-6 months
3. Develop a distribution and fulfillment system	PennDOT	3-6 months
4. Develop/Hold Transit Operator Training	PennDOT (contractor)	6-12 months
5. Develop marketing campaign	PennDOT, Task Force, Operators	3-6 months
6. Rollout New Transit ID Card	Operators	6-12 months
Phase 2: Medium-Term Implementation (Photo ID, magnetic swipe and smart card)		
1. Redesign card for smart readers	Task Force	5-7 years
2. Introduce new cards	Operators	5-7 years
3. Reissue cards as appropriate	Operators	7-8 years
Phase 3: Full Implementation of Smart Card Technology		
1. Redesign/re-issue card as necessary	Task Force	8-12 years
2. Introduce new cards	Operators	8-12 years
3. Develop reporting guidelines	PennDOT	8-12 years
4. Develop/Hold Operator Training (as necessary)	PennDOT	8-12 years

Source: WSA Study Team

6.2.1 Policy Development and Program Implementation

The Study Team recommends convening a Task Force to oversee policy development supporting implementation of the preferred strategy. We anticipate that this Task Force will be an on-going group that oversees updating and improving the Free Transit Program. Membership would likely be consistent with stakeholders participating in the

project's Steering Committee. The task force would have several responsibilities including:

- Oversee recommended pilot/demonstration projects (see Section 6.2.3);
- Develop policies to support proposed improvements to the Free and Half-Fare Transit Programs;
- Conduct pilot projects to examine effectiveness and feasibility of technical recommendations, such as the ability of seniors to swipe passes in readers, reconfiguring swipe readers to accommodate state driver's licenses and State ID cards; and the appropriateness of using PDAs to record senior trips electronically;;
- Monitor smart card developments at transit systems in Pennsylvania; and
- Design a statewide marketing strategy to promote and encourage participation in the recommended strategies.

Develop Policies

Implementing the proposed program changes will require several changes to the structure of the Free Transit Program. These policies will include (among others):

- Create a senior version of the driver's license/State ID card for use in the Free Transit Program; and
- Provide incentives or disincentives to transit operators that have the capability to record senior trips electronically.

Mandatory Use of Swipe Readers

The current recommended strategy allows participants in the Free Transit Program to access the program by either flashing or swiping their cards. In systems that already have swipe readers, PennDOT should encourage operators to record trip making using the swipe readers. As mentioned, such policies may include incentives or disincentives.

In the longer term, pending results from the pilot/demonstration programs and based on how the pace at which smart card technology is evolving, the Task Force should consider mandating that operators record senior trips electronically.

The preferred strategy will ensure that all seniors are using Transit ID cards with magnetically encoded stripes. The missing technology, therefore, would be swipe readers. Low-cost swipe readers are available in the form of PDAs and could be implemented at a reasonable cost (see Section 5.3.1 benefit cost analysis). Results from the pilot/demonstration programs will determine if PennDOT should require all seniors to swipe cards in readers (i.e., full implementation of electronic trip recording). The information need includes 1) is the technology as easy to implement as advised and 2) are seniors able to easily swipe their passes in readers. A second consideration will be the pace at which smart card technology is being implemented; if the technology is moving faster or slower than expected, this interim step may or may not be necessary.

Monitor Smart Card Technology Developments

As referenced in the research, SEPTA and PAT are currently researching and evaluating smart card technology. PennDOT and staff managing the Free Transit Program needs to monitor and track this research to ensure that the technologies adopted are compatible statewide.

The systems must be compatible to ensure the universal nature of the Free Transit Program is retained, e.g., a single transit ID card will be accepted on all systems statewide. PennDOT will likely participate in the funding of such fare collection systems and may wish to use this authority to ensure future systems are compatible.

Design Statewide Marketing Strategy

A key element to future program success is the extent to which the program is effectively communicated to key stakeholders, especially transit operators, seniors and persons with disabilities. The Study Team recommends that the Task Force oversee development of such a strategy. Ideally the marketing/outreach strategy will accomplish several objectives including to promote the Free Transit Program generally, encourage transit use among the senior and disabled communities and build support for recommended changes.

6.2.2 Develop Pilot Programs

The Study Team recommends that PennDOT conduct two or three pilot/demonstration projects as a way to test key features of the preferred strategies. Pilot programs offer a relatively inexpensive way to gain experience with the proposed program concepts and identify areas that need more examination. The pilots can also be used to guide future program marketing campaigns, refined estimated costs as well as build support and momentum for program changes.

We recommend setting up to three pilots to test 1) programming existing swipe readers to accept driver's licenses and state ID cards, 2) the effectiveness of installing hand-held card PDA to read cards, and 3) if available, include seniors or persons with disabilities in potential smart card pilot projects. After the pilot projects are conducted, the experience should be reviewed and evaluated to determine the following:

- How easily does the technology work in terms of logistics such as taking photos and printing ID cards locally and programming swipe readers to accept new cards, driver's licenses and State ID cards, installing smart card readers;
- Are seniors easily able to use the new technology?
- How do seniors feel about the changes in the system? Did the changes impact ridership/program usage?

More detailed information on the Study Team's recommendation for the pilot projects is provided in **Appendix I – Recommended Pilot Projects**.

6.3 Preferred Strategy – Cost Assessment

The Study Team estimates that the preferred strategy will cost between $2.6 and $5.7 million for the program elements recommended for the short term and $3.3 to $5.6 million to implement the longer term strategies, as shown in **Tables 14 and 15**. The variation in estimated program costs reflects some of the voluntary elements of the program. A full cost assessment is included as **Appendix J – Cost Assessment of The Preferred Strategy**.

Table 14: Estimated Capital Costs: Short-to-Medium Term Strategies

	Low Estimate	High Estimate
ID Issuing Equipment	$1,217,000	$1,217,000
Fare Collection Equipment	$1,357,800	$4,463,000
Accounting and Reporting	$30,000	$30,000
Total	**$2,604,800**	**$5,708,000**

Source: WSA Study Team

Table 15: Estimated Capital Costs: Longer Term Strategies

	Low Estimate	High Estimate
ID Issuing Equipment	$3,329,600	$5,627,600
Fare Collection Equipment	$0	$0
Accounting and Reporting	$0	$0
Total	**$3,329,600**	**$5,627,600**

Source: WSA Study Team