



City of Fresno Department of
Transportation/Fresno Area Express

Title VI Fare Equity Analysis: eFare System
Smart Card and Mobile Payment Option



FINAL: April 24, 2019 (Update to October 2018 Report)



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Overview

The City of Fresno Department of Transportation/Fresno Area Express (FAX) plans to invest in an integrated electronic fare payment (eFare) smart card system, with initial implementation scheduled for the second half of 2019 or the first half of 2020. The new fare system will modernize the way FAX customers pay their fares, making travel more convenient by utilizing a more efficient and secure fare collection system. New smart cards can be reloaded and/or linked to a credit or debit card and will be accepted on all FAX buses. Existing fare media will not be changed when the smart cards are introduced. However, FAX may consider eliminating single-use magnetic strip passes in the future and shifting those pass options to the smart card. FAX is also evaluating the impacts of a mobile ticketing option, which it hopes to offer to customers in the near future.

The Federal Transit Administration (FTA) requires transit agencies receiving federal funding to demonstrate compliance with Title VI of the Civil Rights Act of 1964, including conducting service and fare equity analyses to ensure the level and quality of public transportation service is provided in a nondiscriminatory manner. A fare equity analysis evaluates the distribution of potential adverse impacts created by proposed fare changes to ensure the burden is not borne disproportionately by minority or low-income populations. FAX will take the following analysis into consideration and make any necessary modifications to the proposed fare media changes based on the findings.

Relevant Policies

This FAX fare equity analysis was designed in accordance with FTA regulations outlined in FTA C 4702.1B, "Title VI Requirements and Guidelines for Federal Transit Administration Recipients." The following policies and definitions provide a framework for the analysis.

Title VI of the Civil Rights Act of 1964

Statutory authority for FTA's Title VI regulations is found in Section 601 of Title VI of the Civil Rights Act of 1964, which states, *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."*

Thus, federal agencies must ensure recipients of federal funding are not utilizing those resources in a discriminatory manner. For FTA funding recipients, there are several components of Title VI compliance, including: submitting a Title VI Program, setting system-wide standards and policies, collecting and reporting data, evaluating service and equity changes, and monitoring transit service. When transit agencies operating 50 or more fixed-route vehicles in peak service and located in an urbanized area with a population of 200,000 or more propose major service changes or fare changes, they must conduct a service equity or fare equity analysis.

Providers subject to this requirement must adopt written procedures to establish acceptable thresholds for differing service or impacts. An equity analysis requires the agency to evaluate the impacts of the proposed service or fare changes on minority and low-income populations separately to determine if the changes create a disparate impact or disproportionate burden. Though low-income populations are not a protected class under Title VI, the FTA recognizes the importance of evaluating impacts on populations who are more likely to be transit-dependent.

FAX Service and Fare Equity Procedures

In conjunction with the FAX Fixed-Route System Restructure Study (final draft issued June 12, 2018), FAX developed policies outlining the threshold for conducting a *service equity analysis*, including thresholds for a major service change, disparate impact, and disproportionate burden. Per the FTA, these policies must be applied uniformly to all service equity analyses and cannot be altered until the next Title VI Program submission to the FTA. An agency must also develop policies for measuring disparate impact and disproportionate burden in a *fare equity analysis*, which also must be applied consistently and cannot be altered until the next Title VI Program submission. FAX has elected to apply the same disparate impact and disproportionate burden policies to both service equity and fare equity analyses. (Since any change in fare or fare media warrants a Title VI fare equity analysis, a major service change threshold is not required for a fare equity analysis.)

The disparate impact and disproportionate burden policies from the previous service equity analysis have been amended to include fare and fare media changes and will be used for this and any other fare equity analysis until the next Title VI Program submission, when FAX may adjust these policies if it chooses.

Disparate Impact Policy

A disparate impact exists if a major service change, fare change, or fare media change requires a minority population to bear adverse effects by 20 percent or more than the adverse effects borne by the general population in the affected area.

Disproportionate Burden Policy

A disproportionate burden exists if a major service change, fare change, or fare media change requires a low-income population to bear adverse effects by 20 percent or more than the adverse effects borne by the general population in the affected area.

The FTA defines disparate impact and disproportionate burden as follows:

Disparate Impact

Refers to a facially neutral policy or practice that disproportionately affects members of a group identified by race, color, or national origin, where the recipient's policy or practice lacks a substantial legitimate justification and where there exists one or more alternatives that would serve the same legitimate objectives but with less disproportionate effect on the basis of race, color, or national origin. (FTA C 4702.1B, Chap. I-2)

Disproportionate Burden

Refers to a neutral policy or practice that disproportionately affects low-income populations more than non-low-income populations. A finding of disproportionate burden requires the recipient to evaluate alternatives and mitigate burdens where practicable. (FTA C 4702.1B, Chap. I-2)

Application of these policies will be discussed further in the Fare Equity Analysis section of this report.

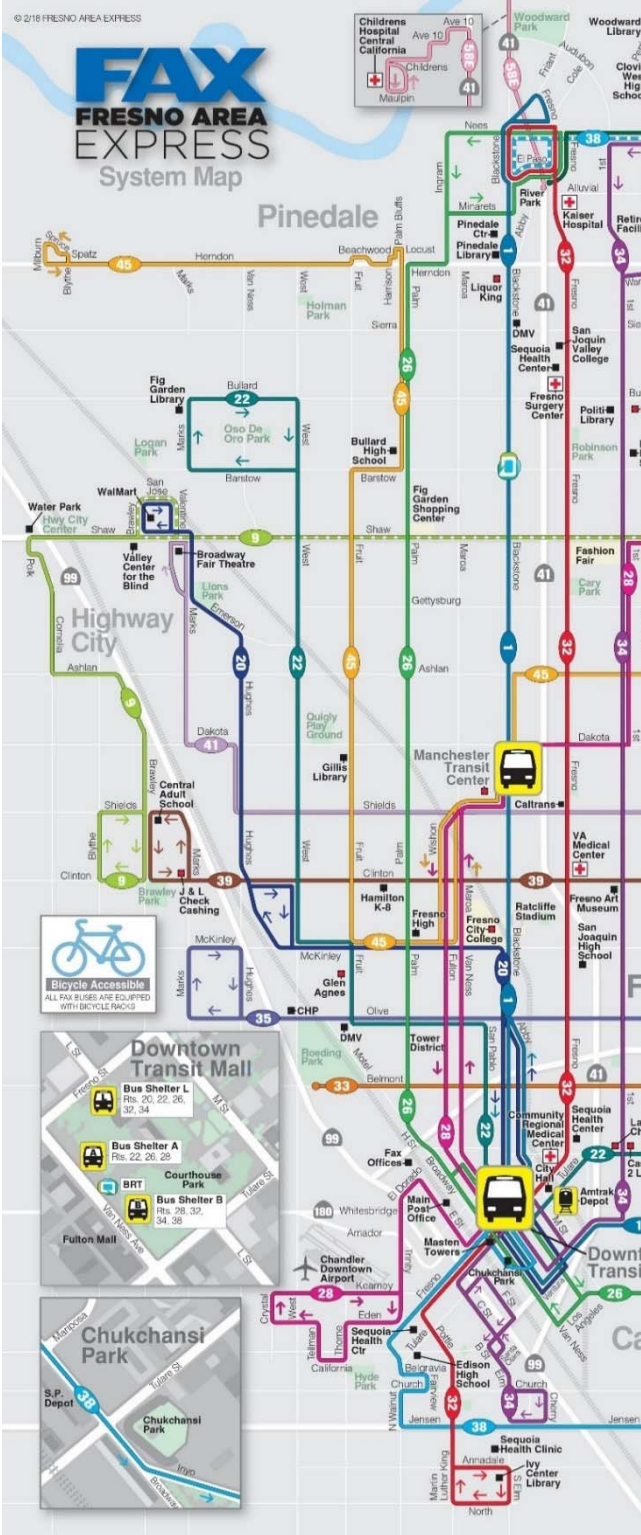
Existing Conditions

FAX operates 16 fixed routes and Handy Ride, a complementary paratransit service provided in compliance with the Americans with Disabilities Act (ADA). One of those 16 routes—Route 1/Q—is a Bus Rapid Transit (BRT) line that began operating in February 2018. See

Figure 1 for the system map of fixed-route service.

Figure 1: FAX System Map

Fare	Price
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Fare Structure

The base fare for FAX fixed-route service is \$1.25. The fare structure is detailed in Table 1. FAX is not proposing any changes to the fare pricing structure at this time.

Fixed-Route Buses	
Base Cash Fare	\$1.25
Reduced Cash Fare*	\$0.60
Children (under age 6)	Free
Handy Ride	
ADA-Eligible Individual Fare per Ride	\$1.50
Companion	\$1.50
Personal Care Attendant	Free

Table 1: Existing Fare Structure (as of August 1, 2018)

*Reduced cash fare is available to seniors 65 and older with a valid ID, Medicare cardholders, and persons with disabilities with a valid ID.

Up to two free transfers are included with a single paid fare (on any fare media), allowing passengers to utilize up to three buses/routes to complete their one-way trip. Transfers can only be made where routes intersect and are not valid for layovers or return trips. Transfers should be requested at the time of boarding and are valid for 90 minutes from the time issued.

Fare Media

Existing fare media includes cash, tokens, passes, and transfers. Fare is paid on-board at the vehicle’s farebox for all routes except the BRT service on Route 1/Q. BRT buses are equipped with a Fast Fare electronic farebox that accepts magnetic fare media and smart cards (no cash), however these fareboxes are currently only used to accept college ID cards. For Route 1/Q, fare is paid prior to boarding at one of the 52 ticket vending machines (TVM) located at Route 1/Q stations. TVMs accept cash or credit card to purchase a 1-Ride Card, 10-Ride Card, or 31-Day Pass, all of which can be purchased for immediate or future use. TVMs also accept tokens and change cards as fare for immediate boarding of a Route 1/Q bus.

Cash

Cash fare is paid upon boarding (or prior to boarding at a TVM along Route 1/Q). A one-way trip costs \$1.25. Fareboxes and TVMs accept \$1, \$5, \$10, and \$20 bills and U.S. currency coins and do not return change. If a customer does not have exact change, the farebox or TVM will issue a change card for the difference. (If the difference is less than \$0.25, no change card is issued.) Change cards can be used like cash on future rides but have no cash value outside of the FAX system.

Tokens

FAX no longer sells tokens as fare media but continues to accept tokens already in circulation. Tokens are redeemed at the farebox upon boarding (or prior to boarding at a TVM along Route 1/Q). One token is good for one fare and two transfers.

Transfers

Upon boarding the bus, a customer can request a transfer ticket from the operator if they anticipate transferring to one or two additional buses to complete their one-way trip. The transfer ticket is only valid for 90 minutes from the time issued. To board the second (or third) bus of the trip, the ticket should be inserted into the transfer unit as proof of payment. Transfers are both issued and accepted on all fixed routes, including BRT service on Route 1/Q. If a trip begins on BRT, the ticket provided by the TVM can be used as proof of payment when boarding the next bus. If transferring from a regular bus to a BRT bus, a customer can request a transfer ticket on the first bus, just as they would for a transfer to another fixed-route bus, and use that transfer ticket as proof of payment when boarding the BRT bus.

1-Ride Card (Full-Fare or Reduced-Fare)

FAX riders can purchase a 1-Ride Card at the base or reduced cash fare price of \$1.25 or \$0.60, respectively. The card is issued as a magnetic strip card and expires after one ride. The magnetic strip card is only good for one use and cannot be reloaded or reused.

10-Ride Card (Full-Fare or Reduced Fare)

Riders can purchase a 10-Ride Card for \$11.25 (or \$6.00 for reduced fare card). Ten single fares would total \$12.50 at full-fare price, so riders who purchase the full-fare 10-Ride Card save the cost of one fare (\$1.25). The reduced fare 10-Ride Card costs the same as ten reduced fares, providing no additional discount. Rides are printed on the back side of the ride card each time it is used. After the last ride has been redeemed, "No Ride" will be printed on the ticket so the customer knows the pass has expired and can be discarded.

31-Day Pass (Full Fare or Reduced Fare)

For FAX customers making at least two unlinked trips per day, the best value is likely the 31-Day Pass. At a cost of \$48.00, the pass is good for unlimited rides during the a 31-day period. The expiration date and time will be printed on the back of the pass when it is first used/activated. A rider should anticipate 39 or more one-way trips over the 31 days in order to realize savings from the 31-Day Pass. The pass is sold as a paper magnetic strip card and cannot be reloaded or reused after it expires.

Points of Purchase

Cash, tokens, and transfers are all processed at the farebox, either on-board or, for Route 1/Q, at the TVM prior to boarding. 1-Ride Cards, 10-Ride Cards, and 31-Day Passes cannot be purchased at the farebox on the bus but can be purchased in advance from a retail pass outlet or any of the TVMs along Route 1/Q. Passes purchased at TVMs (including 1-Ride Cards) can be used on any route, not just Route 1/Q. Table 2 summarizes points of purchase for all fare media. A list of all retail pass outlet locations can be found in Appendix A.

	Purchase at Farebox		Purchase at Retail Pass Outlet		Purchase at Ticket Vending Machine	
	With Cash	With Credit Card	With Cash	With Credit Card	With Cash	With Credit Card
Cash Fare	X					
Token						
1 Ride Card			X	X	X	X
1 Ride Reduced Fare Card			X	X	X	X
10 Ride Card			X	X	X	X
10 Ride Reduced Fare Card			X	X	X	X
31-Day Pass			X	X	X	X
31-Day Reduced Fare Pass			X	X	X	X

Table 2: FAX Fare Media Points of Purchase (as of August 1, 2018)

Proposed Changes

FAX is proposing adding a smart card to its existing fare media options as early as the second half of 2019 or first half of 2020. The smart card will be a plastic, reusable card that can be purchased at existing retail pass outlets and ticket vending machines. The card's functionality has not yet been finalized, but the card will likely have both a digital wallet and pass storage option. The digital wallet stores value that can be applied to single rides or purchasing a pass. The card will also be able to hold multiple passes at once, such as the 10-Ride Card or 31-Day Pass. The card will eventually be reloadable online, at retail pass outlets, or at any TVM. FAX's long-term plan is to transition customers to smart cards and eventually eliminate some of the disposable fare media options.

New and replacement cards will likely cost \$3.00, the current price of the discount fare ID card. To eliminate a potential burden on transit-dependent customers, FAX plans to offer either a limited number of cards at no cost or all cards at no cost for a limited time (ex: 60 days) when the new technology is first implemented. Cards will be available on a first-come, first-serve basis. After that time, any new card will cost \$3.00. If the card a passenger received for free is lost, it will cost \$3.00 to replace the card. Currently FAX issues reduced fare ID cards to eligible riders. The smart card will double as a reduced fare ID card with the rider's photo, so reduced fare passengers will only need to keep track of one card rather than their FAX ID card and their transit pass/smart card.

Fare Equity Analysis

At its core, a fare equity analysis demonstrates that a transit agency has considered the consequences of a proposed policy that is facially neutral but may result in a disparate impact on minority riders or a disproportionate burden for low-income riders. The FTA's suggested methodology for performing a fare

equity analysis begins with determining the number and percent of users of each fare media and evaluating the differences between minority users and non-minority users and low-income and non-low-income users. Next, the analysis should evaluate the impacts of the proposed changes to determine if there is a disparate impact or disproportionate burden. Finally, alternatives must be evaluated and mitigation strategies offered to prevent or mitigate any potential burden.

Whereas either population (from the U.S. Census) or ridership data can be used for a service equity analysis, the FTA recommends using ridership survey data whenever possible for fare equity analyses. The ridership or customer survey data helps an agency determine if minority and/or low-income riders are disproportionately more likely to use the fare media that would be subject to change than the general population (see FTA C 4702.1B, IV-19). FAX's proposed changes will not immediately affect the price or availability of existing fare media. The proposed change is to add another fare media option with the smart card and evaluate the effects of potentially adding a mobile device ticketing option in the future.

Thus, the focus of this fare equity analysis is to answer two key questions:

- 1. Does the introduction of new smart card fare media (available at TVMs, retail outlets, and, at some point, online) create a disparate impact or disproportionate burden? (Note: A limited number of smart cards will be distributed for free during the initial smart card rollout and then be available for a fee.)**
- 2. Does the introduction of mobile ticketing create a disparate impact or disproportionate burden?**

Data Sources

To determine the impact of introducing new fare media, a breakdown of fare media usage for minorities should be compared to non-minorities and low-income compared to non-low-income customers. Additional data about where fare media is purchased, customer access to a smartphone and/or internet, and access to a credit/debit card also help answer the two questions proposed in this analysis. Data from the 2018 FAX Customer Satisfaction Survey were used to perform the Title VI analysis.¹

2018 FAX Customer Satisfaction Survey

The following questions from the survey will be analyzed for the fare equity analysis:

- **Q6:** How do you normally pay your fare? Check one of the following: (1) cash (on-board or ticket vending machine), (2) 1-Ride Card (regular fare), (3) 1-Ride Card (reduced fare), (4) 10-Ride Card (regular fare), (5) 10-Ride Card (reduced fare), (6) 31-Day Pass (regular fare), (7) 31-Day Pass (reduced fare), (8) other/please specify.
- **Q7:** If FAX were to introduce an electronic fare payment system, such as a reusable smart card or mobile device ticketing, would you use it? Yes or no.
- **Q8:** Do you use a debit or credit card for any FAX goods or services that you purchase? Yes or no.
- **Q13:** Do you use a smart phone? Yes or no.

¹ Note: The first draft of this report utilized the 2014 FAX Transit Passenger Survey data, as the 2018 dataset was not yet available. The April 2019 update to the report utilizes the 2018 survey data, which included questions related to current fare media and access that were not asked in the 2014 survey.

- **Q14:** Do you have access to the internet on a daily basis? Yes or no.
- **Demographics, Ethnicity:** Which of the following most closely describes your ethnic background? (1) Hispanic, (2) White/Caucasian, (3) African American/Black, (4) Asian/Southeast Asian- please specify national origin or Asian ethnic group, (5) American Indian, (6) Pacific Islander, (7) Middle Easterner, (8) other/please specify.
- **Demographics, Household Size:** Including yourself, how many people live in your household? (Blank space for entering a number.)
- **Demographics, Income:** Which of the following categories best describes your total household income in 2013, before taxes? (1) less than \$10,000 per year, (2) \$10,000 to \$19,999, (3) \$20,000 to \$29,999, (4) \$30,000 to \$39,999, (5) \$40,000 to \$49,999, (6) \$50,000 to \$74,999, (7) \$75,000 to \$99,999 per year, (8) \$100,000 or more per year.

American Community Survey 5-Year Estimates (2012 – 2016)

American Community Survey (ACS) population data for Census block groups within one-quarter and one-half mile of points of purchase was used to evaluate the accessibility for purchasing fare media. The following ACS tables were used in this analysis: C17002: Ratio of Income to Poverty Level in the Past 12 Months and B03002: Hispanic or Latino Origin by Race.²

Methodology: Smart Card Analysis

The following methodology was used to answer the first question of this analysis:

Does the introduction of new smart card fare media (available at TVMs, retail outlets, and, at some point, online) create a disparate impact or disproportionate burden? (Note: A limited number of smart cards will be distributed for free during the initial smart card rollout and then be available for a fee.)

Step 1: Classify Survey Responses by Minority or Low-Income Status

All respondents who indicated a race/ethnicity other than Non-Hispanic White/Caucasian were considered a minority for purposes of this analysis. If a respondent indicated more than one race/ethnicity, they were considered a minority. Furthermore, if a respondent indicated “other,” they were considered a minority. Records where the respondent did not answer the race/ethnicity question were excluded from the disparate impact analysis, as their minority status could not be determined.³

FAX’s definition of low-income is any person whose median household income is at or below 150 percent of the federal poverty line. The federal poverty guidelines issued by the U.S. Department of Health and Human Services were used as the basis for determining low-income status. See Table 3. Utilizing the survey questions related to household income and number of persons per household, each survey respondent was coded as low-income (below 150 percent of the poverty line) or non-low-income (above 150 percent of the poverty line) according to Table 4. For ranges where a significant portion of the range fell below 150 percent poverty line, the entire range was classified as low-income/”below” to ensure no low-income individuals were mistakenly classified as non-low-income. Households with 13 or more members making more than \$100,000 were considered low-income for the same reason.

² Table B03002 includes all Census race categories by Hispanic or Latino Origin. All categories except for “Not Hispanic or Latino – White” are considered minorities in this analysis.

³ If these respondents did not answer the race/ethnicity question but did answer the questions related to household size and income, they were still included in the disproportionate burden analysis. The FTA directs recipients to analyze disparate impact and disproportionate burden separately.

Table 3: 2018 Poverty Guidelines for the 48 Contiguous States and D.C.

Persons in Family/Household	Poverty Guideline	150 Percent of Poverty Guideline
1	\$12,140	\$18,210
2	\$16,460	\$24,690
3	\$20,780	\$31,170
4	\$25,100	\$37,650
5	\$29,420	\$44,130
6	\$33,740	\$50,610
7	\$38,060	\$57,090
8	\$42,380	\$63,570
9	\$46,700	\$70,050
10	\$51,020	\$76,530
11	\$55,340	\$83,010
12	\$59,660	\$89,480

Table 4: Low-Income Status by 2018 FAX Customer Satisfaction Survey Categories (Below or Above 150% of Federal Poverty Guideline)

Reported Annual Household Income in 2018								
Persons in Household	Less than \$10,000	\$10,000 - \$19,999	\$20,000 - \$29,999	\$30,000 - \$39,999	\$40,000 - \$49,999	\$50,000 - \$74,999	\$75,000 - \$99,999	\$100,000 or More
1	Below	Below	Above	Above	Above	Above	Above	Above
2	Below	Below	Below	Above	Above	Above	Above	Above
3	Below	Below	Below	Above	Above	Above	Above	Above
4	Below	Below	Below	Below	Above	Above	Above	Above
5	Below	Below	Below	Below	Below	Above	Above	Above
6	Below	Below	Below	Below	Below	Above	Above	Above
7	Below	Below	Below	Below	Below	Below	Above	Above
8	Below	Below	Below	Below	Below	Below	Above	Above
9	Below	Below	Below	Below	Below	Below	Above	Above
10	Below	Below	Below	Below	Below	Below	Above	Above
11	Below	Below	Below	Below	Below	Below	Below	Above
12	Below	Below	Below	Below	Below	Below	Below	Above
13+	Below	Below	Below	Below	Below	Below	Below	Below ⁴

Step 2: Determine Minority and Low-Income Share of Fare Media Options

In a fare equity analysis, an agency must evaluate the minority and low-income usage of the affected fare media. In other words, if FAX were to eliminate cash and survey data indicated minority riders were

⁴ Only one survey record fell in this category. Even if the household has an income over 150% of the poverty line, since the exact income is not known, the person was categorized as low-income to ensure no low-income respondents were not counted.

more likely to use cash than non-minority riders (by more than 20 percent), it could trigger a potential disparate impact if accommodations were not made. Since FAX is not removing any existing fare media, there is no immediate burden. However, FAX is completing this analysis to remain FTA compliant and ensure any future benefits of the smart cards are not disproportionately distributed and any discontinuation of existing fare media in the future does not create a disparate impact/disproportionate burden.

The analysis of fare media was performed using the 2018 Customer Satisfaction Survey. According to the survey data, as shown in Table 5, about 82 percent of surveyed FAX riders who answered both the fare media question and the race/ethnicity question reported a race other than Non-Hispanic White. Thus, the expected share of minority riders using each fare media option is 82 percent. Cash use was exactly proportional—82 percent of riders (based on these survey questions) are considered minorities and 82 percent of cash users are considered minorities. The other fare media proportions were not exact but well below the 20 percent threshold. Fewer 1-Ride Reduced Fare Card and 31-Day Reduced Fare Pass users were minorities than expected (less than 82 percent). The “burden” shown in Table 5 indicates if changing or eliminating each fare media option has a greater impact on minorities (positive number) or non-minorities (negative number). This is calculated by taking the difference between the expected minority rider share of each fare media option (82 percent) and the actual minority share of fare media. None of these burdens exceeded (or even neared) FAX’s 20 percent threshold.⁵

Table 5: Fare Media Usage by Minority Status, 2018

Fare Media	Minority	Minority Percent	Non-Minority	Non-Minority Percent	Total	Minority Burden
Cash	711	82%	157	18%	868	0 percentage points
1-Ride Card (Regular)	162	85%	28	15%	190	3 percentage points
1-Ride Card (Reduced)	18	75%	6	25%	24	-7 percentage points
10-Ride Card (Regular)	31	78%	9	22%	40	-4 percentage points
10-Ride Card (Reduced)	19	86%	3	14%	22	4 percentage points
31-Day Pass (Regular)	160	81%	38	19%	198	-1 percentage points
31-Day Pass (Reduced)	89	71%	37	29%	126	-11 percentage points
Other	208	85%	38	15%	246	3 percentage points
Total	1,398	82%	316	18%	1,714	

Similar to minority riders, low-income riders used fare media with relative proportion to their share of overall ridership, as shown in Table 6. Again, cash use among low-income riders was exactly proportional to their share of overall ridership—88 percent of surveyed riders answering the income and fare media questions were considered low-income and 88 percent of all surveyed cash users were low-income. The largest discrepancy was still well below the 20 percent threshold, with a difference between expected and actual low-income share of 10-Ride Reduced Fare Cards of 7 percentage points. In other words, slightly more of the 10-Ride Reduced Fare Card users were low-income than expected. This is a natural outcome, given that only certain riders are eligible for the reduced fare cards.

⁵ The FTA methodology refers to percentage points simply as percentages, so a 20 percent threshold is interpreted as 20 percentage points in practice. See example provided in FTA C 4702.1B, IV-13.

Table 6: Fare Media Usage by Low-Income Status, 2018

Fare Media	Low-Income	Low-Income Percent	Non-Low-Income	Non-Low-Income Percent	Total	Low-Income Burden
Cash	589	88%	79	12%	868	0 percentage points
1-Ride Card (Regular)	128	90%	15	10%	190	2 percentage points
1-Ride Card (Reduced)	17	94%	1	6%	24	6 percentage points
10-Ride Card (Regular)	26	87%	4	13%	40	-1 percentage points
10-Ride Card (Reduced)	19	95%	1	5%	22	7 percentage points
31-Day Pass (Regular)	149	89%	19	11%	198	1 percentage points
31-Day Pass (Reduced)	94	89%	12	11%	126	1 percentage points
Other	167	86%	28	14%	246	-2 percentage points
Total	1,189	88%	159	12%	1,348	

The 2018 survey also asked riders, “If FAX were to introduce an electronic fare payment system, such as a reusable smart card or mobile device ticketing, would you use it?” with yes and no as response options. Of minority respondents, 79 percent said they would use the smart card and/or mobile ticketing (compared to 72 percent of non-minority riders). Of low-income respondents, 79 percent indicated they would likely use these fare media, compared to 76 percent of non-low-income respondents. According to the survey results, minority and low-income riders are more likely to use the smart card or mobile ticketing options than non-minority and non-low-income riders. This has no Title VI implications but is a good indicator that minority and low-income riders would use the new media.

Step 3: Determine Equity of Access to Smart Cards

Any time a new service, lower fare, or new fare media is proposed, an agency must analyze if any direct or associated benefits or positive impacts are equally accessible or distributed. For example, if frequency was improved on a route with mostly non-minority and/or non-low-income riders with no improvements to route(s) serving mostly minority and/or low-income riders, this creates an unequitable distribution of resources. If FAX plans to offer any benefits to smart card usage (reduced fares, fare capping, etc.) that will not be available for existing fare media (magnetic strip cards, cash, etc.), FAX must ensure minority and low-income riders will have the same opportunity to purchase smart cards as non-minority and non-low-income riders. Access includes physical/geographic access, technological/logistical access, and financial access.

Pre-encoded smart cards will be available for purchase at ticket vending machines along Route 1/Q, at retail pass outlets throughout the Fresno/Clovis area, and online. The cards can be reloaded online or at the FAX office at Manchester Center. Most likely when FAX offers reduced fare smart cards in the future, customers will need to visit the Manchester Center FAX office to get their photo taken and provide proof of reduced fare eligibility, similar to the current process for obtaining a reduced fare ID card.

Many transit agencies offer financial incentives to encourage riders to adopt new smart card media, such as fare capping or reduced fares. In the initial implementation of smart card technology, FAX is not proposing any fare capping or other financial advantage to using a smart card compared to a pass or cash payment. However, if FAX were to consider reduced fares or other financial incentives for the smart card in the future, Title VI analysis is required. For example, if the regular fare for a single ride paid in cash was \$1.25 but a single ride paid by smart card was only \$1.00, FAX must ensure minority and low-income riders have just as much access to the smart card as non-minority and non-low-income

riders. Creating a new benefit that is more accessible (by 20 percent or more) to non-minority or non-low-income riders could create a disparate impact or disproportionate burden.

Two approaches were used to determine if minority and low-income riders will have similar access to points of purchase for smart cards: analysis of internet access and usage of credit/debit cards for FAX services (for online purchase or reloading) and geographic distribution of minority and low-income populations in relation to physical points of purchase.

3A: Technological and Financial Access

First, the 2018 survey data was analyzed to determine if minority and low-income riders would have similar access to the internet to purchase, reload, or check the balance of their smart cards. Furthermore, to purchase or reload cards online, customers will need a credit or debit card to complete the transaction. The customer satisfaction survey asked respondents if they had access to the internet on a daily basis (Question 14) and if they use a credit or debit card to purchase FAX goods or services (Question 8). While there is a chance that respondents may have a credit or debit card but have not used it for FAX goods and services, together these questions are a strong indicator of whether minority and low-income customers will be able to purchase and reload smart cards online at a similar rate as non-minority and non-low-income customers.

Survey results were analyzed with three variables: minority status, internet access, and credit or debit card use. 79 percent of minority respondents indicated they had daily access to the internet, compared to 77 percent of non-minority respondents. Of these customers with internet access, 19 percent of minorities have used a credit or debit card to purchase FAX goods or services, compared to 22 percent of non-minority customers. See Table 7. There is a minimal difference between minority and non-minority customers in internet access and use of credit/debit cards. It is notable that the customer base on the whole generally does not use a credit or debit card for FAX purchases. Regardless of internet access and answering the race/ethnicity and income questions, only 18 percent of survey respondents reported using a credit or debit card to purchase FAX goods or services. While there is no Title VI finding, FAX should consider low use of credit/debit cards in planning for the smart card rollout. In-person smart card purchasing and reloading will likely be more common than online transactions (at least for existing customers), so FAX should maximize the network of points of purchase to the greatest extent possible to make smart card reloading convenient.

Table 7: Credit/Debit Card Use among Customers with Internet Access by Minority Status, 2018

Do you use a credit or debit card for any FAX goods or services you purchase?	Minority Customers with Internet Access	Non-Minority Customers with Internet Access	Total Customers with Internet Access
Yes	203	51	254
No	885	186	1,071
Total Responses	1,088	237	1,325
Percent Responding “Yes”	19%	22%	19%

Analysis of low-income and non-low-income respondents yielded similar results to the minority analysis. 80 percent of low-income survey respondents indicated they have access to the internet—the exact same percentage as non-low-income users. Of customers with internet access (who also answered the survey’s income and household size questions), 20 percent of low-income respondents use a credit or

debit card to purchase FAX goods and services (compared to 22 percent for non-low-income respondents). See Table 8. Again, there is not a significant enough difference between low-income and non-low-income customers for internet access and debit/credit card use to create any disproportionate burden Title VI concerns.

Table 8: Credit/Debit Card Use among Customers with Internet Access by Low-Income Status, 2018

Do you use a credit or debit card for any FAX goods or services you purchase?	Low-Income Customers with Internet Access	Non-Low-Income Customers with Internet Access	Total Customers with Internet Access
Yes	187	28	215
No	748	98	846
Total Responses	935	126	1,061
Percent Responding "Yes"	20%	22%	20%

3B: Geographic Access

The second approach to determining access to smart cards was to analyze the demographics of populations within a quarter-mile and half-mile range of a ticket vending machine or retail pass outlet. The purpose of this analysis is to determine if minority and low-income riders have the same access to points of purchase for proposed fare media. If FAX were to incentivize smart card use in the future (through fare capping, reduced fares, etc.) but minority and low-income populations did not have equal access to the card, that could be a potential impact/burden.

A map was created using geographic information systems (GIS) software, and Census block group American Community Survey (ACS) data was added to the map. A quarter-mile and half-mile buffer were drawn around the FAX network and the population, minority population, and low-income populations⁶ calculated within those boundaries. Half- and quarter-mile buffers were also drawn around pass points of purchase (retail pass outlets and ticket vending machines) for comparison to the total system average.

Minority and low-income access to points of purchase is not vastly different from the general accessibility of the system. While 72 percent of the population living within a half-mile of the FAX system is considered a minority population, 77 percent of the population within a half-mile of points of purchase are minorities. The minority share of the point-of-purchase-accessible population is slightly higher/better than the overall system, thus there is no finding of a disparate impact. See

⁶ FAX used the same definitions and data tables as the 2018 FAX Fixed-Route System Restructure Study for this analysis. Any person identifying as Non-Hispanic White was considered a minority and any person falling below 150 percent of the poverty threshold was considered low-income.

Table 9 and the corresponding map in Appendix B.

Table 9: Populations within a Half-Mile with Access to FAX, Points of Purchase

	Total Population	Minority Population	Minority Percent of Total Population	Low-Income Population	Low-Income Percent of Total Population
Within a half-mile of FAX network	473,335	343,035	72%	221,237	47%
Within a half-mile of Points of Purchase	117,886	91,098	77%	62,990	53%

Similarly, 47 percent of the population living within a half-mile of the FAX system is considered low-income, compared to 53 percent of the population living within a half-mile of points of purchase. Again, the low-income share of the population near points of purchase is slightly higher than the low-income share of the overall system, so there is no finding of a potential disproportionate burden. This analysis was replicated with a quarter-mile buffer with similar results. Details of the quarter-mile analysis are available in Appendix B.

Methodology: Mobile Ticketing Analysis

FAX is considering offering a mobile ticket option in the future (in addition to the smart card). Customers would be able to scan an appropriately-configured mobile device at the payment validator on-board or at TVMs along Route 1/Q. FAX has not yet procured the appropriate software/technology for mobile ticketing but has plans to do so in the near future.

If there are benefits to mobile ticketing (like a cheaper fare or pass options with cost savings not available in a magnetic strip card), access to the new media should be analyzed to evaluate if it is equitable for minority and low-income customers. Survey data related to mobile phone ownership and access to a debit or credit card were used to analyze mobile ticketing accessibility. Again, there may be respondents who have access to a debit or credit card but have not used it to purchase FAX goods or services.

The following methodology was used to answer the second question of this analysis:

Does the introduction of mobile ticketing create a disparate impact or disproportionate burden?

Step 1: Classify Survey Responses by Minority or Low-Income Status

To answer the second question of analysis, the earlier process (used to analyze Question 1) was replicated, integrating data on smart phone usage from the 2018 Customer Satisfaction Survey.

All respondents who indicated a race/ethnicity other than Non-Hispanic White were considered a minority for purposes of this analysis. If a respondent indicated more than one race/ethnicity, they were considered a minority. Furthermore, if a respondent indicated “other,” they were considered a minority. Records where the respondent did not answer the race/ethnicity question or indicated “prefer not to declare” were excluded from the equity analysis, as their minority status could not be determined.

As with the analysis for the first question (Does introduction of a smart card create a disparate impact or disproportionate burden?), low-income status was determined based on the household size and income questions in the 2018 Customer Satisfaction Survey. Classification of responses for low-income analysis is shown in Table 4.

Step 2: Determine Minority and Low-Income Share of Fare Media Options

Similar to the discussion of introducing a smart card, if FAX were to introduce a mobile ticketing option, it may consider discontinuing other fare media, like the magnetic strip card passes. The analysis of current fare media indicates any discrepancies between minority and non-minority and low-income and non-low-income usage of each fare media option does not exceed the 20 percent threshold.

Removing any one of these media would not trigger an immediate finding of a disparate impact or disproportionate burden. However, with such high cash use among all customers, it is recommended FAX continue accepting cash. If future surveys (conducted after smart card and mobile ticketing implementation) indicate a major shift in fare media utilization from cash to the smart card or other media, FAX can re-evaluate the appropriateness of accepting cash at that time.

Step 3: Determine Minority and Low-Income Access to Credit/Debit Card and Mobile Device

Similar to the smart card access analysis, survey results were analyzed with three variables: minority status, smart phone use, and credit or debit card use. Like internet access, most FAX customers have access to a smart phone, according to the 2018 survey. 82 percent of minorities responded “yes” to “Do you use a smart phone?” compared to 80 percent of non-minorities.

Of those customers using smart phones, 18 percent also indicated they have used a credit or debit card to purchase FAX goods or services. Considering minority customers with smart phones, 18 percent of these survey respondents also used a credit/debit card, compared to 21 percent of non-minority users with smart phones. See Table 10. The two-percentage-point difference between minority and non-minority smart phones users is well under the 20 percent threshold, so there is no disparate impact finding for introducing mobile ticketing.

Table 10: Credit/Debit Card Use among Customers with Smart Phone by Minority Status, 2018

Do you use a credit or debit card for any FAX goods or services that you purchase?	Minority Customers with Smart Phone	Non-Minority Customers with Smart Phone	Total Customers with Smart Phone
Yes	203	53	256
No	933	195	1,128
Total	1,136	248	1,384
Percent Responding “Yes”	18%	21%	18%

Analysis of low-income and non-low-income respondents yielded similar results to the minority analysis. 82 percent of low-income respondents indicated they use a smart phone as well as 82 percent of non-low-income respondents. There is no difference in smart phone ownership among FAX riders based on income, according the survey results.

Of customers using smart phones, 20 percent said they have also used a credit or debit card to purchase FAX goods or services. Once again, there was little difference between low-income and non-low-income smart phones owners in their usage of credit or debit cards for FAX fares. 20 percent of low-income customers with smart phones have used a credit/debit card for FAX, compared to 22 percent of non-low-income customers with smart phones. See Table 11. The two-percentage-point difference between low-income and non-low-income smart phones users is well under the 20 percent threshold, so there is no disproportionate burden finding for introducing mobile ticketing.

Table 11: Credit/Debit Card Use among Customers with Smart Phone by Low-Income Status, 2018

Do you use a credit or debit card for any FAX goods or services that you purchase?	Low-Income Customers with Smart Phone	Non-Low-Income Customers with Smart Phone	Total Customers with Smart Phone
Yes	191	28	219
No	777	102	879
Total	968	130	1098
Percent Responding "Yes"	20%	22%	20%

Based on the available data, there is no indication that minority and low-income riders have significantly less (20 percentage points or more) access to checking accounts/mobile devices than non-minority and non-low-income FAX riders.

Impact Assessment and Mitigation

The FTA recommends transit agencies conduct a fare equity analysis for any fare changes, including fare increases or decreases of any amount or changes to fare media. A fare equity analysis evaluates the distribution of potential adverse impacts created by proposed fare changes to ensure the burden is not borne disproportionately by minority or low-income populations. FAX conducted this fare equity analysis because introducing the smart card/eFare technology offers customers a new fare media option. The initial implementation of the smart card/eFare system will not provide cost savings for the customer and none of the existing fare media will be changed or discontinued. So, the introduction of the smart card itself does not create any immediate disparate impact or disproportionate burden.

In the case that the smart card has financial advantages in the future (such as reduced fares or fare capping), FAX must determine if these positive impacts are equally distributed/accessible regardless of race/ethnicity or income. Similarly, permanently removing any fare media in the future should be evaluated for Title VI impacts. This equity analysis has analyzed geographic and technological access to existing smart card points of purchase (TVMs and retail pass outlets) as well as future points of purchase (online/on mobile devices). As FAX is also considering introducing a mobile ticketing option, bankability (access to a debit card/checking account) and smart phone access have also been analyzed.

The analysis summarized in this report does not indicate any discrepancy of 20 percentage points or greater between minority and non-minority or low-income and non-low income customers, and thus there is no known impact on minority or low-income riders to introducing a smart card or mobile ticketing option as described in the "Proposed Changes" section of this report.

Though there was not data available to analyze the extent of the hardship, FAX acknowledges that the \$3.00 fee for the smart card could pose a financial hardship for some low-income riders. To mitigate any potential hardship, FAX plans to offer either a limited number of cards at no cost or all cards at no cost for a limited time (ex: 60 days) when the new technology is first implemented. Furthermore, FAX will continue its partnerships with area social service agencies to improve transit access for low-income populations.

Public Participation and Outreach

FAX conducted public outreach in September 2018 to solicit customer feedback on the proposed smart card and mobile ticketing options. First, a 10-question outreach survey⁷ was developed to gather additional and more recent data on fare media usage by minority and low-income status. The survey was available on Survey Monkey, an online survey tool, from Tuesday, September 11, 2018 through Friday, September 28, 2018. Paper copies of the survey were also distributed and collected by light duty FAX operators on buses and at the Downtown Transit Mall and Manchester Transit Center. Paper copies were also collected at the outreach events on September 18, 2018 and September 19, 2018.

The primary goals for the outreach were to begin introducing the smart card concept to the public and gather feedback to further explore the two questions under consideration in this fare equity analysis. To accomplish this goal, FAX focused efforts on reaching as many riders as possible. FAX and the consultant team developed a schedule including two public meetings, a stakeholder engagement meeting, and three pop-up events on September 18, 2018 and September 19, 2018.

Notice of public meetings and the online survey were posted on FAX buses beginning September 11, 2018. The notice included a link and QR code for riders to take the survey. (See Appendix C for copy of the notice.) The events and survey were also promoted on the FAX website and social media channels. This promotion strategy was designed to reach frequent FAX riders who will be most affected by the introduction of a smart card. The pop-ups were scheduled for high-traffic areas—Downtown Transit Mall (Shelters A/B and Shelter L), Blackstone & Shaw, and Cedar & Ventura—to maximize resources.

During the pop-up events and public meetings, FAX staff and consultants discussed the proposed smart card and its future applications and encouraged attendees to complete the outreach survey. Attendees were given the option to either fill out a paper survey or have the survey questions read aloud by the FAX staff or consultant. The survey was printed in both English and Spanish and a Spanish-speaking FAX staff member was available to provide translation services. Completing the survey was incentivized, with all respondents entered in a drawing to win a 31-Day Pass. A fact sheet (printed in both English and Spanish) was also available to provide more details on the smart card rollout. A copy of the survey and fact sheet is included in Appendix C.

FAX also held a stakeholder engagement meeting on Tuesday, September 18, 2018 to discuss the proposed changes and gather feedback from professionals who work with transit-dependent populations and social service agencies. There were 8 attendees at the meeting. The consultants gave a

⁷ The outreach survey differs from the 2018 Customer Satisfaction Survey. The outreach survey was distributed to as many riders as possible, whereas the 2018 Customer Satisfaction Survey was designed to collect enough data to ensure a statistically significant sample. The 2018 Customer Satisfaction Survey was considered robust enough for Title VI analysis and was the primary data source for this report. The outreach survey can provide additional insights or corroboration but was not conducted with the intent to drive the Title VI analysis.

short presentation of the fare equity analysis process and initial findings and then provided time for attendees to ask questions. Most questions were focused on the logistics of the smart card rollout, many of which haven't yet been determined. The posters and presentations used for the stakeholder and public meetings are included in Appendix C, along with a list of attendees at all events. (Names were copied from the survey raffle tickets to the sign-in sheets for the pop-up events.)

While there was low attendance for the two public meetings (one attendee each night), FAX and consultant staff drew a strong survey return from pop-up events, with 129 surveys collected. In total, 454 surveys (between paper copies and Survey Monkey) were returned. With 83 percent of survey respondents indicating a race or ethnicity classified as a minority, and 87 percent considered low-income, the outreach is consistent with the ridership demographics of previous surveys, as shown in Table 12.

Table 12: Comparison of Minority and Low-Income Populations in Recent FAX Surveys

	2014 Customer Satisfaction Survey	2018 Transit Passenger Survey	2018 Fare Equity Survey	2018 Customer Satisfaction Survey
Percentage of Respondents Considered Minorities	75%	84%	83%	82%
Percentage of Respondents Considered Low-Income	92%	79%	87%	88%

Major highlights from the public outreach included strong support for continued acceptance of cash after the initial smart card rollout. While removing cash would not exceed the 20 percent threshold for a disparate impact or disproportionate burden, over half of survey respondents (54 percent) indicated cash fare (at the farebox or ticket vending machine) is the fare media they use most frequently.

When FAX and consultant staff explained that the smart cards would not replace cash, the second most common concern was how much the cards would cost. Some event attendees indicated that the \$3.00 fee upfront would not be worth the advantages of the card. FAX riders said reduced fares or other financial incentives would make them more likely to pay the \$3.00 fee for a smart card.

The outreach survey was not designed and distributed with the intention of collecting a statistically representative sample, but still provides useful insight into FAX customer preferences. The outreach survey results validated the findings of the 2018 Customer Satisfaction Survey (and previous analysis of the 2014 Customer Satisfaction Survey), which found that minority and low-income customers have similar access to smart phones and the internet as non-minority and non-low-income customers. Furthermore, minority and low-income shares of each fare media option are proportional to the share of ridership, or under the 20 percent threshold. The outreach survey analysis did not indicate any findings of a disparate impact or disproportionate burden. Survey analysis is included in Appendix D.

Conclusion

FAX has proposed adding a smart card to the existing fare media options, beginning in the second half of 2019 or the first half of 2020. FAX plans to initially roll out the card with limited functions and later introduce further card capabilities, online card management options, and a mobile ticket option. Since FAX is not removing any existing fare media, there is no disparate impact or disproportionate burden on riders using existing fare media. However, if implementation of the smart card is successful, FAX may consider removing some of its current fare media options in the future. Thus, this analysis has also analyzed those potential future actions.

Using a model comparing minority use of each fare media to the minority percentage of ridership indicated distribution among fare media options was mostly consistent with the minority share of ridership. Any discrepancies fell below the 20 percent disparate impact threshold. The same model was used for low-income ridership, which also showed fare media distribution consistent with the low-income share of ridership. There were no discrepancies that exceeded the 20 percent disproportionate burden threshold. Additional analysis found that smart phone usage is similar between minority and non-minority as well as low-income and non-low-income customers. Introduction of a mobile ticketing option in the future is not expected to generate a disparate impact or disproportionate burden.

There will be no immediate financial benefit to a smart card or mobile ticket option, however FAX may consider those options (fare capping, incentives for using smart card or mobile ticket) in the future. If there were advantages to using the new fare media, FAX must ensure that minority and low-income populations have equal access to the fare media. Analysis of data available at the time of this report's completion found that minority and low-income populations had equal access to existing points of purchase as non-minority and non-low-income populations. Furthermore, the 2018 survey data did not indicate a significant gap in access to internet services or smart phones, should smart card functions be focused on the internet in the future.