Final Report

SANDAG Transit Fare Discount Study

Prepared for the San Diego Association of Governments
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July 2, 2024

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Appendices

1. Introduction

As the regional metropolitan planning agency, the goal of the San Diego Association of Governments (SANDAG) is to help more people in the region get to their destinations: this includes making transit more affordable. This will reduce greenhouse gas emissions and the amount people are driving. In turn, this will help our region meet the state's climate requirements, which we must meet to keep getting important funding for local transportation projects.

The 2021 Regional Plan includes reduced/free fares as a policy, and in 2022, SANDAG and the San Diego Region's two transit operators, the San Diego Metropolitan Transit System (MTS) and the North County Transit District (NCTD) launched a pilot program offering free transit for youth 18 and under. This Youth Opportunity Pass pilot program has proven to be very successful, and it has been extended twice while the region seeks a permanent way to fund it. SANDAG carried out this Transit Fare Discount Study (the study) to explore additional programs.

Through this study, SANDAG researched other types of programs that could be offered in the future to give specific groups of transit riders free or reduced fares. The study examined the fare structures of similar transportation agencies to learn from their experience. The study analyzed nine fare reduction scenarios, using income data from the Federal Reserve Bank FRED database and the U.S Census Bureau, and from the recent rider survey. The analysis estimated the extent to which offering certain types of transit fare discount programs would encourage more people to use public transit and change travel behavior, and to understand the full costs of implementing such programs. SANDAG also collected feedback from the public about their priorities while informing them about potential funding limitations.

In keeping with the study's scope of work, this report does not offer a firm recommendation as to a preferred scenario but offers decision-makers and SANDAG staff a sense of the costs, benefits, and potential tradeoffs of implementing these scenarios. The research conducted and feedback gathered in this study will be used to inform part of the 2025 Regional Plan.

The technical information contained in this should be read in conjunction with the results of the public and stakeholder engagement effort, which provided valuable context on public opinions about fare reduction. Most notably, in the broad engagement work done to-date, fare reduction strategies typically scored third when compared to investments in improving the frequency, reliability and security of transit. For frequent riders, fare reductions did not rank in the top three investments.

Also, as a matter of policy, it should be noted that the consensus of the project team, which includes the region's two transit operators, is that no fare reduction scenario should be implemented without a sustainable long-term funding source to cover its costs.

2. Best Practices Review

To gauge experience and best practices from the transit industry, SANDAG consulted and researched the following agencies that have implemented free or reduced-fare programs in the last few years:

- Kansas City – RideKC
- Albuquerque - ABQ RIDE
- Seattle - King County Metro
- Los Angeles County - LA Metro
- Denver - Regional Transportation District (RTD)
- San Francisco - Bay Area Rapid Transit (BART)
- Southeastern Pennsylvania Transportation Authority (SEPTA)

The full report is contained in Appendix 1. These case studies illustrate how the above agencies have implemented reduced fare programs that seek to enhance transit accessibility in their respective regions. Many of the agencies featured in this study were selected due to their similarity to the San Diego region in population, farebox recovery ratio, passenger miles, and fleet size. Kansas City and Albuquerque were included because, although smaller than MTS, they are among the larger systems to have eliminated fares. The social and financial impact of reduced/zero fare programs in comparable regions is important for informing modifications to the fare structure of transit agencies in San Diego County.

Each of the agencies reviewed has implemented either permanent or temporary discounted fare structures. Currently, permanent reduced fare programs for low-income riders are offered by Los Angeles Metro, Seattle King County Metro, Denver RTD, and BART. Kansas City Area Transportation Authority (KCATA) and Albuquerque's ABQ Ride are the only ones above which have implemented long term zero-fare programs. Although an official end date has not been established, KCATA's zero fare program will continue into 2024, while ABQ Ride's zero fare program became permanent in 2023. Additionally, SEPTA launched a new income-based zero fare pilot program in 2023, and RTD Denver launched a new youth zero fare program.

The programs have proven popular, particularly with lower-income riders; the Bureau of Transportation Statistics estimates that transportation costs disproportionately burden low-income households, who spend up to 30% of after-tax income on transportation. In Kansas City, RideKC ridership notably outpaced the national average by recovering 80% of its pre-pandemic ridership by October 2020, although this high recovery rate is likely due to a combination of zero fares and very high rates of transit dependency. In Albuquerque, in the program's first year, ABQ RIDE saw a 22% increase in ridership from March 2022 to March 2023. Community feedback has been positive, and survey respondents overwhelmingly cite financial difficulty, public safety, and ease of mobility as key issues addressed by the program.

In general, the experience of these agencies indicates that "one size does not fit all" and that it is far more feasible for agencies with low fare box recovery ratios (i.e. the degree to which fare box revenues offset operating and maintenance costs) to adopt universal zero fare programs, as a smaller percentage of operating expenses are covered by passenger fares. In 2019, before the zero-fare programs were implemented, KCATA's fare box recovery ratio stood at 9.1%, while ABQ Ride's was 6.5% - in the case of Albuquerque, the cost of collecting fares actually exceeded the value of the fares collected. Comparable 2019 figures for MTS and NCTD were 32.7% and 16.1%, respectively, indicating how much more fare revenues in San Diego County contribute to system operating costs. Even with lower fare revenues to begin with, the effect of losing fares was not insignificant; in Kansas City, service reduction is an unintended consequence of fare elimination, which counteracts equity gains achieved through zero fares. Agencies with high farebox recovery ratios benefit from a larger share of passenger fare revenue. Therefore, it is more feasible for agencies with high farebox recovery, such as MTS and NCTD to reduce fares for specific passenger groups – most notably lower-income passengers - in order to preserve revenue streams.

In the case of means-tested income-based programs, transit agencies have various options for determining eligibility conditions. Many government services use a benchmark based on the Federal Poverty Level (FPL) as a guideline to determine income requirements for benefits. However, all of the aforementioned agencies use a more generous income requirement because the FPL does not account for geographic differences in cost of living. The income requirement chosen by King County Metro is 280% of the FPL, BART uses 200%, Denver RTD 185%, and SEPTA 150%. LA Metro does not specify their FPL percentage to qualify for their program, and instead uses a flat annual income limit based on household size. The limit at the time of time of this writing is $44,150 for a one-person household, which is about 300% of the FPL. Employing an income limit 2-3 times higher than the FPL ensures that both households below the poverty line and cost-burdened households above the FPL qualify for transit discounts. This consideration is important for meeting equity objectives because the income threshold for cost-burdened households changes depending on geographic location.

3. Public and Stakeholder Engagement

The study's goal for connecting with the public was to better understand their priorities for discounted fare programs and transportation investments. The study team engaged with the public throughout the San Diego region, with special emphasis on traditionally underserved populations (including low-income, minority, and limited English proficiency populations). The full report is contained in Appendix 2. The team gathered input from key stakeholders and the community through:

- Presentations to SANDAG Working Groups, including the Mobility Working Group and Social Equity Working Group
- Contracting with a group of community-based organizations (CBOs) who provide resources and/or advocacy for historically underserved populations
- Pop-ups at community events in partnership with these CBOs
- Tabling at transit centers
- Distributing a survey

Stakeholder Engagement. The team presented at several SANDAG working group meetings, providing an overview of the study, project updates, and asking for their input on our outreach process. The membership of these working groups included community and government agency staff throughout the region who are uniquely able to provide input reflecting varying perspectives. The team attended the following meetings:

- SANDAG Social Equity Working Group (July 13, 2023, and November 16, 2023)

Included representatives from 11 community-based organizations (CBOs) or serving underserved and underrepresented communities across the region

- SANDAG Mobility Working Group (November 9th, 2023)

Included representatives from planning staff of the region's 18 cites, the County of San Diego, the region's transit operators (MTS and NCTD), the Port of San Diego, and the San Diego County Regional Airport Authority

CBO Committee. In addition, a committee of social equity CBO staff members was created to support outreach efforts. These groups included:

- El Cajon Collaborative
- Mid-City CAN
- Vista Community Clinic
- City Heights CDC

The team met with this committee and sent them materials so they could refine the outreach tactics and messaging, ensuring that these were accessible for their members. The team partnered with these CBOs and attended community events in each of their service areas. A total of six public outreach events were attended by the outreach team in coordination with CBO partners, including an extra opportunity that was provided by a member of the Social Equity Working Group, Chula Vista Community Collaborative, that was not a member of the project CBO committee.

Public Outreach. The team gathered feedback in November and December 2023 in a variety of ways: this included pop-up events, tabling at transit centers, website and email updates, an online survey, and posters and materials translated into several languages. Our initial goals for this outreach were 1,000 survey responses and 500 in-person participants. We significantly surpassed these goals with a total of 2,053 survey participants and 620 touchpoints across pop-up events.

Outcomes. Based on this input, we learned:

1. The top priority expressed about free or discounted transit fares from all participants (survey, community pop-ups, and transit pop-ups) was for free or discounted transit fares for low-income riders.

2. In-person participants ranked free or reduced transit fares for adults 65 and older as their second highest priority, while survey respondents online ranked continuing the free transit program for youth 18 and under as their second choice.

3. In-person participants chose the free transit program for youth 18 and under as their third priority and survey respondents favored free transit for students as their third priority.

4. Keeping transit coming frequently was important to all participants. It was ranked as the most important priority for transit funding by survey respondents and participants at the

community pop-ups. It was the second most important priority for participants at transit pop-ups (tied for 2nd place with cleaning and fixing things on transit).

5. The transit riding experience was important to participants at the transit center pop-ups. They ranked transit safety as their top priority and cleaning and fixing things on transit as their second priority (tied with frequency).

6. Both community event and survey participants overall ranked free or discounted fares as the third most important priority while transit center pop-up participants did not include this in their top three priorities. Instead, they prioritized expanding transit service to new areas as their third most important priority.

Implications for the 2025 Regional Plan. A proposed program to offer free or discounted fares for low-income populations (with the YOP in continuance) will be proposed to be included in the 2025 Regional Plan. The SANDAG Board of Directors will ultimately determine whether there is funding to implement this plan without negatively impacting current transit operations, ensuring that the region continues to maintain frequency, safety, and service hours.

4. Fare Pricing Scenarios Selected for Analysis

The study reviewed numerous potential fare scenarios and considered several for advancement into the evaluation.. Including fare program applications that call for both reducing fares and eliminating fares altogether, the scenarios range from policies that apply to only very specific rider groups to systemwide programs that affect mobility system users regionally. To choose the specific scenarios for analysis, SANDAG conducted comprehensive peer/best practices research, coordination with its transit agency partners, and public outreach that helped pinpoint the fare applications that may be most effective for the San Diego region and target user needs most directly.

Derived from Peer Analysis

As summarized in Section 2 above and the study's Fare Equity Options and Considerations report (see Appendix 3), SANDAG identified transit agencies in California and nationwide that are similar to San Diego transit agencies in terms of size and context, and that are valuable for fare policy experience review. SANDAG identified fare scenarios that have typically already been adopted by other agencies and that may be relevant for San Diego. Primarily, these include:

- Income-based programs, including income participation thresholds that have been set by other agencies.
- Systemwide fare reduction and elimination programs, which have been introduced elsewhere and have offered a range of regional mobility and equity effects.

Transit Agency Guidance

Beyond peer research, SANDAG coordinated with its partner agencies, MTS and NCTD, to help identify local transit operator interests and priorities related to fare equity. Through this coordination, SANDAG was able to both better understand transit operators' fare-related considerations and concerns, and to gauge their perceived acceptability boundaries with regards to fare reduction or elimination. Based on this coordination, SANDAG defined scenarios related to the following:

- Income-based programs
- The existing Youth Opportunity Pass program, including its extension, expansion to additional age groups, and a transitional model involving both fare reduction and elimination based on age level.

Community-Driven

Furthermore, from the regionwide public outreach that indicated community priorities and needs related to fare payment and transit access overall, SANDAG determined fare programs that best address community needs and are most responsive to regional mobility priorities. Specifically, SANDAG engaged public input to identify and define scenarios that relate to the following:

- Programs for special user types, including confirmation of user types that would most benefit from fare policy adjustment.
- Systemwide fare programs for all riders, including fare reduction and elimination alternatives.

From the above research, SANDAG identified nine scenarios for analysis, which each include a unique set of fare application strategies, characteristics, and modeling parameters. The scenarios, which include the following and are detailed below, outline specific fare application parameters for evaluation and comparison.

Scenario 1 – Youth Opportunity Pass Extension
Scenario 2 – Youth Opportunity Pass Age Expansion
Scenario 3 – Transitional Youth Opportunity Pass
Scenario 4 – Income-Based Program
Scenario 5 – Program for Special User Types (Reduced)
Scenario 6 – Program for Special User Types (Zero Fare)
Scenario 7 – Higher Education Student Expansion
Scenario 8 – Systemwide Fare Reductions
Scenario 9 – Systemwide Zero Fare Program

Please note that while listed parameters generally apply to transit regionwide, they are modified in certain scenarios to accommodate COASTER, which features a ridership profile, operating and cost characteristics that are unique in the San Diego region, and therefore offers separate fare program-related effects and considerations.

Scenario 1 - Youth Opportunity Pass Extension

- Strategy:
  - Extend the Youth Opportunity Pass Program to remain active beyond the planned June 2026 ending date.

- Agency Responsibilities:
  - Continue administering PRONTO Youth accounts.
  - Train drivers/fare inspectors to verify eligibility.

- Secure funding to sustain program.

- Rider Responsibilities:
  - For riders already using program, maintain PRONTO Youth access and always ride with proof of program participation.
  - For new program participants, obtain a PRONTO Youth card or app and always ride with proof of program participation.

- Parameters for Analysis:
  - Parameters are defined by existing Youth Opportunity Pass Program definition and policies.

Scenario 2: Youth Opportunity Pass Age Expansion

- Strategy:
  - Expand Youth Opportunity Pass Program eligibility by offering free transit access (50% reduced COASTER fares) to anyone under age 25.

- Agency Responsibilities:
  - Continue administering PRONTO Youth accounts with modified age parameter.
  - Train drivers/fare inspectors to verify eligibility.
  - Secure funding to sustain program.

- Rider Responsibilities:
  - For riders already using the program, maintain PRONTO Youth access and always ride with proof of program participation.
  - For new program participants, obtain PRONTO Youth card or app and always ride with proof of program participation.

- Parameters for Analysis:
  - Apply Youth Opportunity Pass Program definition (and a defined 50% reduction on COASTER fares), as well as eligibility to anyone age 24 and under.

Scenario 3: Transitional Youth Opportunity Pass

- Strategy:
  - Expand Youth Opportunity Pass Program eligibility from anyone under age 18 through age 24 by offering free transit access to anyone under age 19 and reduced fares to anyone between the ages of 19 and 24.

- Agency Responsibilities:
  - Continue administering PRONTO Youth accounts with modified age parameters.
  - Train drivers/fare inspectors to verify eligibility.
  - Secure funding to sustain program

- Rider Responsibilities:
  - For riders already using the program, maintain PRONTO Youth access and always ride with proof of program participation.
  - For new program participants, obtain PRONTO Youth card or app and always ride with proof of program participation.

- Parameters for Analysis:
  - Apply Youth Opportunity Pass Program eligibility to anyone under age 25, specifically by maintaining the existing Youth Opportunity Program zero-fare policy for anyone under age 19, and applying a 50 percent reduced fare policy for anyone between the ages of 19 and 24.

Scenario 4: Income-Based Program

- Strategy:
  - Offer free (50% reduced COASTER fares) or reduced fares to riders under a certain income level.

- Agency Responsibilities:
  - Administer verification of income eligibility.
  - Design and implement a method for riders to prove their eligibility and/or participation in program.
  - Train drivers/fare inspectors to verify eligibility.
  - Secure funding to sustain program.

- Rider Responsibilities:
  - Provide verification to agency for program enrollment. This may be conducted annually.
  - Obtain proof of verification and provide to drivers/fare inspectors while riding.

- Parameters for Analysis:
    i. Offer a total fare elimination (and for COASTER, offer a 50% fare reduction) for individuals with a Gross Income At or Below 100% of the Federal Poverty Level

Scenario 5: Program for Special User Types (Reduced)

- Strategy:
    - Offer reduced fares to active military, veterans, and all first responders (for COASTER, offer 50% reduction on zone-based monthly passes for active military only).

- Agency Responsibilities:
    - Conduct outreach and coordination with identified rider group.
    - Administer verification of eligibility.
    - Design and implement a method for riders to prove their eligibility and/or participation in program.
    - Train drivers/fare inspectors to verify eligibility.
    - Secure funding to sustain program.

- Rider Responsibilities:
    - Provide verification to agency for program enrollment. This may be conducted through agency outreach.
    - Obtain proof of verification and provide to drivers/fare inspectors while riding.

- Parameters for Analysis:
    - Parameters are defined by application of a 50% fare discount for active military and veterans, as well as for first responders except on COASTER, where active military only would receive a 50% discount on zone-based passes.

Scenario 6: Program for Special User Types (Zero Fare)

- Strategy:
    - Offer free transit access to active military, veterans, and all first responders (for COASTER, offer 50% reduction on zone-based monthly passes for active military only).
- Agency Responsibilities:
    - Conduct outreach and coordination with identified rider group.
    - Administer verification of eligibility.

- Design and implement a method for riders to prove their eligibility and/or participation in program.
- Train drivers/fare inspectors to verify eligibility.
- Secure funding to sustain program.

- Rider Responsibilities:
  - Provide verification to agency for program enrollment. This may be conducted through agency outreach.
  - Obtain proof of verification and provide to drivers/fare inspectors while riding.

- Parameters for Analysis:
  - Parameters are defined by an elimination of fares for active military and veterans, as well as for first responders, except on COASTER, where active military only would receive a 50% discount on zone-based passes.

Scenario 7: Higher Education Student Expansion

- Strategy:
  - Offer free transit access to all higher education students, including attendees of four and two-year institutions, junior colleges, trade schools, etc. (for COASTER, offer 50% reduction on zone-based monthly passes for students under the age of 24 only).

- Agency Responsibilities:
  - Conduct outreach and coordination with identified rider group.
  - Administer verification of eligibility.
  - Design and implement a method for riders to prove their eligibility and/or participation in program.
  - Train drivers/fare inspectors to verify eligibility.
  - Secure funding to sustain program.

- Rider Responsibilities:
  - Provide verification to agency for program enrollment. This may be conducted through agency outreach.
  - Obtain proof of verification and provide to drivers/fare inspectors while riding.

- Parameters for Analysis:
  - Parameters are defined by an elimination of fares for all higher education students, except on COASTER, where students under age 24 would receive a 50% discount on zone-based passes.

Scenario 8: Systemwide Fare Reductions

- Strategy:
  - Except for COASTER, reduce all transit fares systemwide for all riders (current COASTER fare structure would remain intact).

- Agency Responsibilities:
  - Continue collecting fares, but at a reduced rate.
  - Secure funding to sustain program.

- Rider Responsibilities:
  - None

- Parameters for Analysis:
  - Reduce all existing fares by 50% for all riders systemwide, with the exception of COASTER, where the current fare structure would remain intact.

Scenario 9: Systemwide Zero Fare Program

- Strategy:
  - Make transit free (no fares) for all riders (50% reduced COASTER fares).

- Agency Responsibilities:
  - Stop fare collection.
  - Continue data collection on ridership.
  - Secure funding to sustain program.

- Rider Responsibilities:
  - None

- Parameters for Analysis:
  - Reduce all existing fares by 100% for all riders networkwide, with the exception of COASTER, where fares will be reduced by 50%.

5. Scenario Assessment

This section presents the results of a multi-criteria analysis of the nine fare reduction scenarios. In keeping with the study's scope of work, the section does not make recommendations as to a preferred scenario but offers decision-makers and SANDAG staff working on the regional plan update a sense of the costs, benefits, and potential tradeoffs of implementing these scenarios.

FARE ANALYSIS GOALS

SANDAG believes that transit and rail systems are essential to a transportation future in which people and goods can move around the region efficiently and safely while reducing the impact on the environment. SANDAG's goal is to plan and build a regional transportation system that is fast, fair, and clean.

Transit agencies in the U.S. and abroad have long experimented, as a part of short-term pilot programs as well as longer-term policy actions, with free or discounted fares as a way to reduce automobile use, ease traffic congestion, boost transit ridership, improve air quality, and/or to promote transportation equity. SANDAG's regional mobility goals align closely with these objectives and, together, establish a framework for optimizing the San Diego region's approach to transit fares. The following six goals are described below:

- Transportation Equity
- Ridership
- Climate/Sustainability
- Fiscal Impact
- Customer Experience/Safety/Security
- Transit Operations/Performance/Maintenance

Transportation Equity

SANDAG has a deep commitment to social equity as outlined in the Commitment to Diversity, Equity, and Inclusion statement. The organization believes every individual—including those from historically underserved and marginalized groups have a right to be treated with fairness, respect, and acceptance to ensure their safety and opportunity for

growth. Subsided transit fare could play a role in achieving this goal by promoting social equity and boosting access to a broad range of activities throughout the region.

Considering how reduced or eliminated transit fares can potentially level the economic playing field, primarily by allowing residents to allocate their limited financial resources towards other necessities (thus reducing income inequality), SANDAG seeks to evaluate how fare reduction or elimination would affect equity across the San Diego region as a whole.

Ridership

A key potential effect of transit fare reduction or elimination is enhanced access to the mobility system overall and increased transit ridership in general. Specifically, free or reduced fare programs have the potential to grow transit ridership by easing access to transit for all residents, enhancing the mobility of disadvantaged groups, and making it easier for specific rider groups, such as students and seniors, to use transit for their everyday mobility needs. Furthermore, understanding the impact of fare increases on ridership (the inverse of discounting fares) is also valuable.

Therefore, assessing ridership effects is one of SANDAG's primary fare analysis goals. SANDAG also recognizes that to achieve their full potential, fare reduction or elimination programs should be integrated into comprehensive policies to achieve California's transportation, social, and environmental goals overall.

Climate/Sustainability

Environmental sustainability and air quality have always been top priorities for SANDAG. The organization believes that transit and rail systems are essential to a transportation future in which people and goods can move around the region efficiently and safely while reducing the impact on the environment. Therefore, by assessing how fare reduction or elimination programs can potentially affect regional transit use overall, SANDAG also seeks to analyze the potential climate and sustainability impacts of those programs as well. With clear climate and sustainability objectives, SANDAG will engage its analysis to help indicate fare programs that offer the most positive climate effects. However, SANDAG recognizes that while fare reduction or elimination programs may substantially increase transit ridership, they are typically not very effective for getting people out of their automobiles unless they are combined with improved transit service (frequencies, spans, speed, reduced travel times, and enhanced reliability), and measures that increase the generalized cost of traveling by car, such as cordon pricing, road pricing, parking pricing, restrictions on travel and increased fuel and vehicle taxation.

Fiscal Impact

As transit fare program adjustments will directly impact transit system usage, demand, and operations, they will inevitably introduce fiscal and budgetary affects regionwide. Therefore, analyzing the specific fiscal impacts of fare reduction and elimination programs represents one of SANDAG's primary fare analysis goals.

Specifically, introducing fare reduction or elimination may encourage residents to use transit more frequently and increase transit system ridership overall. However, there are concerns about the effect on agencies' farebox recovery ratio, on the fiscal health of agencies. If fare reductions lead to a decrease in revenue (i.e. if offsetting revenue sources are not identified), transit agencies will face challenges in maintaining and improving infrastructure and service quality. Further, on lines where spare capacity is limited or doesn't exist, additional service will need to be provided, resulting in an increase in the overall costs associated with capital needs and ongoing operations. These factors could impact long-term sustainability and competitiveness, and may require transit agencies to explore and invest in alternative revenue sources for offsetting the budget effects associated with fare reductions. Revenue replacement strategies may include a wide range of innovative approaches, such as the existing partnership with local colleges and universities through the regional U-Pass Program, which ensures transit access for all higher education students across the region and provides transit funding through lump-sum payments that cover the university student community.

Through its fare analysis, SANDAG will evaluate the potential effects on fiscal impacts associated with various fare reduction and elimination approaches. Fiscal impact assessment will be framed in part by the evaluation previously conducted in the Operating and Maintenance Cost Methodology paper (see Appendix 1). Based on this analysis, SANDAG will be able to more effectively balance specific program approach's regional benefits with associated costs of implementation and administration.

Customer Experience/Safety/Security

The SANDAG 2025 Regional Plan aims to make the area's transportation system more convenient, healthy, safe, and equitable. In alignment with this plan, SANDAG seeks to evaluate how fare reduction and elimination might affect the overall safety, security, and rider experience associated with the San Diego region's transit system and mobility network as a whole.

For example, increased transit ridership might make it cost effective (with additional funding) for transit agencies to raise service frequency that will influence safety and security of passengers by lowering their wait time on the streets. In addition, fare programs can affect

overall safety in varying ways, as more riders on transit vehicles can contribute to a perception of a safer environment (more individuals present to be vigilant and supportive of security measures), and fare enforcement can promote security in transit systems as well. On the other hand, free or very low fares may encourage more non-destination ridership and non-transit activity near transit centers, which pose their own actual, or perceived, security issues and may require additional safety/security enforcement resources. Furthermore, if fare reduction or elimination programs significantly increase ridership beyond the capacity of the existing infrastructure, it could result in overcrowding, which can pose its own set of safety concerns. In general, SANDAG seeks to analyze both the potential positive and negative effects of introducing fare reduction or elimination programs.

Transit Operations/Performance/Maintenance

In direct relation to its analysis of ridership and fiscal impacts in particular, SANDAG seeks to assess, through its fare analysis process, transit fare reduction and elimination programs' potential impacts on transit operations, system performance, and overall maintenance needs. To determine how fare programs might affect these areas, it is critically important to understand the transportation needs, travel preferences, and the characteristics of the intended recipients. For example, fare reduction or elimination can mitigate issues related to fare evasion, as more people can afford to pay for their tickets. This may mean reduced operations costs related to fare control. Moreover, fare reduction/elimination can potentially lead to a more streamlined boarding process and reduce boarding times, conceivably causing more effective, efficient, and reliable operation of buses. In addition, potential beneficial effects of transit fare reduction or elimination may require transit agencies to expand their services, which could enhance transit system performance but also require added maintenance and additional funding for increased service.

SCENARIO ASSESSMENT

Based on the specific strategies and modeling parameters determined as a part of the scenario identification process, each scenario is assessed to gauge their alignment with the fare analysis goals discussed in Section 2. The assessment also includes considerations related to the burden of program implementation on both riders and the transit operators. This assessment not only indicates the scenarios that advance SANDAG's fare equity objectives most extensively, but also helps reveal which alternatives would potentially be most effective for implementation regionwide.

Each scenario as listed in Section 4 is analyzed and compared against one another, as well as against a baseline fare scenario. Throughout the assessment, Scenario 1, which is the extension of the existing Youth Opportunity Pass program, is considered the baseline, since it

constitutes a program that is currently in-effect and will not be altered or redefined to change its current characteristics or level of impact, which is currently experienced by today's users of the mobility network.

The results are shown in Figure 5-1 on the following page, and key findings are discussed in the following pages.

Figure 5-1: Overall Scenario Comparison

COMPARATIVE FACTORS			SCENARIOS								
			1	2	3	4	5	6	7	8	9
			Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Equity		#Trips for Riders w/ <$35k Household Income	34M	34.9M	34.3M	40.6M	34.3M	34.8M	34.3M	38.7M	43.9M
		% Change from Baseline (Scenario 1)	N/A	+2.5%	+1%	+19%	+1%	+2.3%	+0.7%	+14%	+29%
Fiscal Impact	DIRECT IMPACT FACTORS	O&M Costs	$431M	$434M	$432M	$449M	$432M	$433M	$432M	$447M	$467M
		Fare Revenues	$65M	$58M	$62M	$46M	$62M	$59M	$60M	$37M	$2.4M
		Savings from Discontinued Fare Collection	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$12.9M
		Admin Costs of Means-Tested Program	N/A	N/A	N/A	$2.9M	N/A	N/A	N/A	N/A	N/A
		Subtotal Net Operating Support (NOS)	N/A	$376M	$370M	$406M	$370M	$375M	$372M	$410M	$452M
	COMPARATIVE FISCAL PERFORMANCE	Increase in NOS from Baseline (Scenario 1)	N/A	$10.1M	$4.1M	$37.3M	$3.6M	$8.8M	$5.9M	$44M	$99M
		%Increase in NOS from Baseline (Scenario 1)	N/A	2.7%	1.1%	10.2%	1%	2.4%	1.6%	12%	27%
		Fare Recovery % (Fare Revenue/O&M Cost)	15.1%	13.3%	14.4%	10.3%	14.4%	13.5%	14%	8.2%	0.5%
		Reduction in Fare Revenue Per Capita	N/A	$2.17	$0.91	$5.75	$0.79	$1.91	$1.41	$8.63	$19.08
		Total NOS Per Capita	$111.65	$114.72	$112.89	$123.04	$112.76	$114.33	$113.45	$125.09	$141.84
		Per Capita NOS Increase from Baseline	N/A	$3.07	$1.24	$11.39	$1.11	$2.68	$1.80	$13.44	$30.19
Ridership		Total Boardings	63.5M	64.7M	64M	70.2M	63.9M	64.5M	64M	69.5M	76M
		% Change from Baseline (Scenario 1)	N/A	+1.8%	+0.75%	+10.6%	+0.67%	+1.6%	+0.77%	+9.4%	+19.7%
Climate		Change in VMT from Baseline (Scenario 1)	N/A	-4.7M	-2.0M	-27.9M	-1.8M	-4.2M	-2.0M	-24.6M	-51.8M
Qualitative Measures	SERVICE QUALITY	Transit Operations	X	X	X	X	X	X	X	X	X
		Overall Network Performance	X	X	X	X	X	X	X	X	X
		System Maintenance	X	X	X	X	X	X	X	X	X
Impact Levels:	CUSTOMER EXPERIENCE	Potential Overall Negative Effects on Riders	X	X	X	X	X	X	X	X	X
A. Low X		Negatively Affect Safety & Security	X	X	X	X	X	X	X	X	X
B. Moderate X	PROGRAM FEASIBILITY	Ease of Access / Use	X	X	X	X	X	X	X	X	X
C. High X		Rider Eligibility Verification	X	X	X	X	X	X	X	X	X
		Technical Implementability	X	X	X	X	X	X	X	X	X
		Political Implementability	X	X	X	X	X	X	X	X	X

Transportation Equity

Although a full Title VI equity analysis is beyond the scope of the current study, an indication of potential effects on disadvantaged communities is critical to informed decision-making. To provide a high-level indication of their potential overall effects on equity, the annual passenger boardings (ridership) were estimated for each scenario for riders with an annual household income of less than $35,000. These values are as follows:

Figure 5-2: Equity Analysis Results by Scenario

COMPARATIVE FACTORS		SCENARIOS								
		1	2	3	4	5	6	7	8	9
		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Equity	# of Trips for Riders w/ <$35k Household Income	34M	34.9M	34.3M	40.6M	34.3M	34.8M	34.3M	38.7M	43.9M
	% Change from Baseline (Scenario 1)	N/A	+2.5%	+1%	+19%	+1%	+2.3%	+0.7%	+14%	+29%

Scenario 9, which provides unlimited transit access to all at no cost, unsurprisingly has the greatest positive impact on equity, and for similar reasons Scenario 8 has significant positive equity impact as well. However, Scenario 4, which focuses specifically on serving populations affected by acute equity concerns, has the second-highest positive equity impact.

Fiscal Impact

For each scenario, the following cost quantities were estimated: annual operating and maintenance (O&M) costs, revenues from passenger fares, savings associated with the

discontinuation of fare collection for Scenario 9, and administrative costs of facilitating means-tested programs such for Scenario 4. The analysis, based in part on the Operating and Maintenance Cost Methodology paper (see Appendix 4), includes an estimate of increased service needed on highly utilized elements of the transit system, due to ridership increases from reduced fares. From these values, a combined annual change in net operating support (NOS) value was derived, representing the subsidy requirements. These values are shown below:

Figure 5-3: Fiscal Impact Analysis Results by Scenario

COMPARATIVE FACTORS		SCENARIOS								
		1	2	3	4	5	6	7	8	9
		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Fiscal Impact	O&M Costs	$431M	$434M	$432M	$449M	$432M	$433M	$432M	$447M	$467M
	Fare Revenues	$65M	$58M	$62M	$46M	$62M	$59M	$60M	$37M	$2.4M
	Savings from Discontinued Fare Collection	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	$12.9M
	Admin Costs of Means-Tested Program	*Some Cost Impact	*Some Cost Impact	*Some Cost Impact	$2.9M	*Some Cost Impact	*Some Cost Impact	*Some Cost Impact	N/A	N/A
	Change in Net Oper. Support	$0	+$10M	+$4M	+$40M	+$4M	+$9M	+$6M	+$44M	+$86M
	% Change from Baseline (Scenario 1)	N/A	+2.7%	+1.1%	+10%	+1.1%	+2.5%	+1.6%	+12%	+23%

*Please note that there will be some level of administrative cost impact associated with scenarios that require facilitation of manual eligibility reviews, participant registration, etc.

Overall, the analysis indicates that Scenarios 9, 8, and 4, which each provide far-reaching fare reductions or elimination, would have the greatest fiscal impact on transit delivery and would require the highest level of ongoing revenue replacement.

In addition, when comparing scenarios' levels of fiscal impact, consideration of the following factors is important:

- **Cost,** as represented by the change in net operating support (NOS), is the difference between total operating costs and fare revenues for the baseline vs. the scenarios. This amount would need to be covered by funding from other sources in order for transit operations to remain sustainable in the long-term.
- **Cost-effectiveness**, which is the estimated incremental NOS for each scenario compared to the estimated total boardings by passengers from households with a household income under $35,000 relative to the baseline Scenario 1. Not surprisingly, there is a generally proportional relationship between the number of new trips from this income group and the incremental NOS, corresponding to approximately $7.50 per new lower-income trip.

- **Incremental NOS per capita,** which is a rough indicator of the 'affordability' of a scenario in terms of its average bottom-line impact on the average resident of the County. Other studies have employed a similar statistic, fare revenues per resident, to assess the 'fiscal lift' required to make up for lost fare revenue without having estimates of ridership growth available. For comparative purposes, the 'fiscal lifts' associated with some agencies that enacted zero-fare include (in 2019 dollars):

    - DASH (Alexandria, VA): $30.41
    - Greater Richmond Transit Authority (GCTC): $7.77
    - Sun Tran (Tucson, AZ): $14.50
    - Kansas City Area Transit Authority (KCATA): $8.01

    The corresponding fiscal lifts for MTS and NCTD in 2019 were $39.25 and $12.93 respectively. As a larger and more heavily traveled operator, MTS on its own would be higher than DASH, while NCTD on its own would be in the range of the three zero fare systems with smaller 'fiscal lifts''.

Ridership

The total number of annual passenger boardings (ridership) was estimated for each scenario as shown below, and as described in the Ridership Sketch Model Methodology paper (see Appendix 5). Breakouts of total ridership by household income bracket and by operator may be found in Appendix 6.

Figure 5-4: Ridership Effects Analysis Results by Scenario

COMPARATIVE FACTORS		SCENARIOS								
		1	2	3	4	5	6	7	8	9
		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Ridership	Total Boardings	63.5M	64.7M	64M	70.2M	63.9M	64.5M	64M	69.5M	76M
	% Change from Baseline (Scenario 1)	N/A	+1.8%	+0.75%	+10.6%	+0.7%	+1.6%	+0.8%	+9.4%	+19.7%

The analysis indicates that while each scenario has a potentially positive impact on ridership, only Scenarios 9, 4, and 8 are likely to have substantial ridership effects. This is unsurprising, as these scenarios are the most expansive in terms of improving transit system access.

Transit Operations/Performance/Maintenance

To assess each scenario's potential effect on the operations, performance, and maintenance of the regional transit system, qualitative data emerging from technical research, public input, and the targeted peer analysis were evaluated. Specifically, details derived from the experiences of other transit agencies informed the analysis of how fare programs might affect the general operability of the transit network, including operational feasibility, overall network performance, and system maintenance considerations. The relative assessed impact levels of each scenario, based on the comparison of the scenarios against one another, are indicated below.

Figure 5-5: Transit Operations/Performance/Maintenance Analysis Results by Scenario

IMPACT CATEGORIES Impact Levels • Low X • Moderate X • High X		SCENARIOS								
		1	2	3	4	5	6	7	8	9
		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Service Quality	Transit Operations	X	X	X	X	X	X	X	X	X
	Overall Network Performance	X	X	X	X	X	X	X	X	X
	System Maintenance	X	X	X	X	X	X	X	X	X

Aside from Scenarios 8 and 9, which both apply fare changes systemwide, scenarios are likely to have minimal impact on service quality in general. Based on research and peer experiences, fare programs have a significant effect on service quality only when they introduce substantial ridership increases that affect all levels of operations networkwide.

Customer Experience

Qualitative data informed by peer research and public input was engaged once again to evaluate customer experience effects. By understanding how other transit agencies' riders were directly affected by the introduction of fare reduction or elimination programs, the analysis can assess how each scenario might affect the transit mobility experience in the San Diego region Relative customer experience impact levels for each scenario, which are based on the comparison of the scenarios against one another and include factors related to the overall ride experience and the maintaining of a safe and secure mobility environment, are indicated below.

Figure 5-6: Customer Experience Impact Analysis Results by Scenario

IMPACT CATEGORIES		SCENARIOS								
		1	2	3	4	5	6	7	8	9
Impact Levels • High X • Moderate X • Low X		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Experience	Potential Overall Rider Effects	X	X	X	X	X	X	X	X	X
	Maintain Safety & Security	X	X	X	X	X	X	X	X	X

It is not anticipated that any of the user group-based scenarios (2,3,5,6, and 7) would result in discernible changes in the overall transit passenger experience from the baseline Scenario 1. Passengers would likely notice slightly higher vehicle loads under Scenarios 4 (Income-based) and 8 (Systemwide Reduced), but not to the extent of feeling less comfortable.

Under Scenario 9 (Systemwide Zero Fare) passengers would notice higher vehicle loads on some routes, especially on the San Diego Trolley and the busiest routes on the MTS bus system; these routes would feel more crowded, even though loading standards would not likely be exceeded. Scenario 9 would also save local bus passengers some travel time from elimination of the fare payment step, although the time for additional passengers to board would offset this somewhat. The net savings, perhaps on the order of 5-10 seconds per passenger on MTS buses and half that on NCTD, would not likely be perceived as significant.

Climate/Sustainability

To represent each scenario's potential effects on climate goals and environmental sustainability, the net annual reduction in private vehicle-miles traveled (VMT) over the baseline Scenario 1 was estimated. Allowances were made for some of the new trips coming from active modes (e.g. biking and walking). It should be noted that relative to San Diego County's total annual VMT, which was approximately 32 billion for 2022, even the most effective Scenario 9 makes a relatively small contribution.

Climate/sustainability effects analysis findings for each scenario include the following:

Figure 5-7: Climate/Sustainability Effects Analysis Results by Scenario

COMPARATIVE FACTORS		SCENARIOS								
		1	2	3	4	5	6	7	8	9
		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Climate	Overall Change in VMT from Baseline (Scenario 1)	N/A	-4.7M	-2.0M	-27.9M	-1.8M	-4.2M	-2.0M	-24.6M	-51.8M

Based on the analysis, the scenarios that have the greatest effect on ridership also have the greatest impact on climate and sustainability. In general, by having the greatest potential to drive individuals to transit and away from private automobile use, Scenarios 9, 4, and 8 stand to offer the largest reduction in regional VMT.

Ease of Access/Program Administration

To assess each scenario's potential effect on ease of access to the transit system and overall fare program administration, qualitative data emerging from technical research, public input, and the targeted peer analysis were evaluated. Specifically, details derived from the experiences of other transit agencies informed the analysis of how fare programs might affect riders' ability to access the network, as well as challenges facing transit agencies related to verifying participant eligibility and fare program implementation in general. The relative assessed impact levels of each scenario, based on the comparison of the scenarios against one another, are indicated below.

Figure 5-8: Ease of Access/Program Administration Effects Analysis Results by Scenario

IMPACT CATEGORIES Impact Levels • Low X • Moderate X • High X		SCENARIOS								
		1	2	3	4	5	6	7	8	9
		Youth Opportunity Pass Extension (Baseline)	Youth Opportunity Pass Age Expansion	Transitional Youth Opportunity Pass	Income-Based Program	Program for Special User Types (Reduced)	Program for Special User Types (Zero Fare)	Higher Education Student Expansion	Systemwide Fare Reductions	Systemwide Zero Fare Program
Program Feasibility	Ease of Access/Use	X	X	X	X	X	X	X	X	X
	Rider Eligibility Verification	X	X	X	X	X	X	X	X	X
	Technical Implementability	X	X	X	X	X	X	X	X	X
	Political Implementability	X	X	X	X	X	X	X	X	X

Overall, the analysis indicates that while Scenarios 8 and 9 provide the greatest ease of use for riders, they also provide challenges related to implementation, primarily based on their extensiveness and overall level of fiscal impact. All other scenarios, which each require verification of eligibility for participation, feature moderate levels of difficulty associated with ease of access.

6. Funding

Both the peer review and discussions with NCTD and MTS highlighted the need to secure stable long-term funding to replace lost fare revenue in any fare reduction or elimination scheme. The downsides to not doing so are clear: a frustrated riding public if the program must be curtailed or eliminated due to lack of funding, or the need to find the funds "elsewhere," which often results in reduced service. Service reductions work at odds to expanding equitable access to transit. This challenge will grow over at least the short-term, due to inflationary pressures and the mandate to fully convert the Region's transit fleets to vehicles with zero localized emissions. For these reasons, the study undertook an initial, high-level look into funding. What follows is a brief description of the more common potential sources.

Sales Tax Funding. This local source can be the most flexible, so long as a fare-reduction program is explicitly listed as one of the proposed uses of the funds. However, both operators have noted that sales tax funds are problematic because they can fluctuate significantly during a year or year-over-year, and this has already been experienced by MBTA and LACMTA. This is not a good fit for replacing operating funding which is a constant draw on resources. It should be noted that the Citizen's Initiative on the ballot for the fall 2024 Presidential election does not feature a fare-reduction program. It does include operating funds, but these are relatively limited and may be entirely subscribed to operate the new transit capital projects in the measure.

State-Level Special Legislation. In concert with other California transit agencies who have implemented reduced-fare programs, state-level legislation could provide the necessary funding, and establish a common framework. Such legislation was in fact introduced at a recent legislative session. It did not make it out of Committee, but another attempt could be made. The current deficit facing the State is not a conducive environment, however.

Managed Lanes Receipts. The Regional Plan features a robust network of new Managed Lanes. When more of this network comes on-line, some of the proceeds from this operation could be allocated for reduced-fare programs.

Tuition Fees. The U-Pass program is funded by dedicated tuition fees at schools where the program is active. If the program were to be expanded to more schools regionwide, additional tuition-fee revenue would be expected to be part of the expansion.

Federal Funding. Currently, the Federal Transit Administration (FTA) is focusing on capital funding for new or extended transit services. The FTA has given no indication that the Federal government is interested in participating in fare-reduction programs.

Grants, Sponsorships. For the reasons noted above, it is recommended to avoid such funding, because it is usually of a one-time or short-duration nature.

Whatever the source, it should also be noted that any new funding coming into the Region should be considered not only for fare reduction strategies, but for other transit investments that survey and engagement participants have noted as being more important – such as service expansion, and increased cleanliness and security.

7. Key Findings

Key results of the study include the following:

- Several transit agencies have implemented or piloted new zero- or reduced-programs during and since the COVID pandemic. As of this writing only a single across-the-board free-fare program has been made permanent (Albuquerque), and this was partially possible because fare revenue was already a very small part of the operating budget. Most systems are currently piloting programs targeted at specific populations; the most prevalent are free fares for youth, and free or discounted-fares for lower-income riders.
- When it comes to a choice between using new transit funding to reduce fares or improve service, the public we engaged with indicated a preference for better service. Keeping transit coming frequently was important to all participants, ranking as the most important priority for transit funding by survey respondents and participants at the community pop-ups. It was the second most important priority for participants at transit pop-ups (tied for 2nd place with cleaning and fixing things on transit).
- Both community event and survey participants overall ranked free or discounted fares as the third most important priority while transit center pop-up participants did not include this in their top three priorities. Instead, they prioritized expanding transit service to new areas as their third most important priority.
- The top priority expressed by the public about free or discounted transit fares from all participants (survey, community pop-ups, and transit pop-ups) was for free or discounted transit fares for low-income riders.
- In-person participants ranked free or reduced transit fares for adults 65 and older as their second highest priority, while survey respondents online ranked continuing the free transit program for youth 18 and under as their second choice.
- In-person participants chose the free transit program for youth 18 and under as their third priority and survey respondents favored free transit for students as their third priority.

- The user group-based scenarios (2, 3, 5, 6, and 7) are estimated to yield the smallest increases in trips by travelers from households with an income of less than $35,000.

- Among the user group-based scenarios, Scenario 7 (Higher Education) is estimated to be the least efficient at generating new 'equity' trips, because much of its target market is already utilizing the U Pass or other university pass programs.

- Scenarios which extend only 50% fare reductions, either to groups or to users systemwide, are about half as expensive and half as effective as proposed zero-fare applications.

- The means-tested income-based Scenario 4 is more efficient at generating new travel by equity priority riders than systemwide scenarios.

- There is reason to believe that a scenario offering the most prevalent form of means-tested fares (a 50% discount below 200% of the FPL) would yield an efficient result as an intermediate between the user group-based scenarios and a 50% systemwide fare reduction.

Appendix 1: Transit Fare Discount Program Study Best Practices Analysis

Introduction

Several transit agencies have responded to growing demand for affordable public transit by eliminating fares. However, the impact of eliminating fares is inconclusive and highly dependent on the amount of fare revenue the agency collected before elimination. Other agencies have responded by introducing discount programs that reduce transportation costs and improve access to jobs, education, and services.

Transportation costs disproportionately burden low-income households, who spend up to 30% of after-tax income on transportation. Fare subsidies are a salient policy response to concerns about equity and transportation cost, and a solution to regressive flat-fare structures which burden low-income riders.

The COVID-19 pandemic triggered significant fare collection challenges for transit agencies. To encourage ridership, two of the following peer agencies leveraged state and federal funding opportunities to experiment with zero fare programs. Others, including San Diego's Metropolitan Transit System (MTS) and North County Transit District (NCTD), have adopted permanent reduced fare programs for specific population segments. Together with MTS and NCTD, SANDAG piloted the Youth Opportunity Pass (YOP) program in 2021 to eliminate fares for riders 18 and under. As a result of the program's success, a broader free or reduced fare program within San Diego County is under consideration. The following peer agency summaries will identify types of discount programs, clarify their challenges, and assess impacts associated with implementing free and/or reduced fare programs.

Peer Transit Agency Summaries

Kansas City – RideKC

In April 2020, Kansas City became the largest U.S city to eliminate bus fares, implementing a zero-fare policy in response to COVID-19. To offset between $8-$10 million in lost farebox revenue, the Kansas City Area Transportation Authority (KCATA) used Federal Coronavirus Aid, Relief, and Economic Security (CARES) Act, Coronavirus Response and Relief Supplemental Appropriations Act, and American Rescue Plan grants to sustain the program through 2023. Additionally, KCATA continued to collect a small amount of revenue from paratransit services through 2023.

As of 2024, the temporary federal dollars that covered KCATA's zero fare program have nearly run out. Kansas City Council agreed to cover a portion of KCATA's lost revenue using $4.8 million set aside from the City's existing transit budget, which is derived from a half-cent public transit sales tax. Kansas City also levied an additional 3/8th cent sales tax specifically for funding KCATA, currently the agency's second largest funding source. The agency is also considering reintroducing fares, which would generate between $5.8 and $7.1 million in additional funding.

Several key findings suggest that zero fares benefit Kansas City residents, particularly low-income and transit-dependent riders. A 2020 RideKC survey found that 44% of respondents reported no car access as their main reason for using transit, and that 47.3% of respondents use transit to get to work, primarily in industries labeled “essential” during the pandemic.

RideKC ridership notably outpaced the national average by recovering 80% of its pre-pandemic ridership by October 2020. However, it is unclear if this high recovery rate is due to zero fares, high rates of transit dependency, or a combination of both factors. Routes which retained the highest ridership primarily serve Kansas City’s transit dependent communities, which have lower median incomes and/or higher populations of historically marginalized people.

The Kansas City Area Transportation Authority estimates that zero-fare will save the community between $1.3 and $4.6 million in annual personal income and produce between $4.2 and $13.8 million in additional annual economic output. Additionally, it is estimated that increased ridership could reduce regional transportation emissions by an estimated 0.2%, or 7,000 tons of emissions annually.

Furthermore, KCATA reported that security incidents requiring escalation decreased by 39% after zero-fare implementation due to a reduction in fare disputes. However, these benefits are offset by service reductions due to the elimination of farebox revenue; out of 56 regular routes, 41 operate one bus per hour.

Albuquerque - ABQ RIDE

In January 2022, the City of Albuquerque launched the Zero Fares Pilot Program, which eliminated fares for buses and paratransit. Formerly, regular fares were $1 and ABQ Ride operated a low-income reduced fare program for seniors and qualifying riders. Prior to the Zero Fare Pilot, Albuquerque Ride conducted outreach surveys and found that 84% of surveyed passengers reported an annual income below $35,000, below the city's median annual income of $53,000. Additionally, about 46% of surveyed passengers reported no access to a vehicle.

In the program’s first year, ABQ RIDE saw a 22% increase in ridership from March 2022 to March 2023. Community feedback has been positive, and survey respondents overwhelmingly cite financial difficulty, public safety, and ease of mobility as key issues addressed by the program. Students, non-drivers, seniors, and people with limited mobility have reported that they benefit from the Zero Fares program. Ridership data is collected through automated and manual counts, as well as through qualitative survey responses. ABQ RIDE collects data and reports on monthly ridership.

ABQ Ride’s Zero Fares program became permanent in November 2023, making Alburquerque the largest U.S city to eliminate transit fares. While the program has enjoyed popularity among transit riders, it has faced local controversy due to reports of increased crime directed at bus drivers. In response, Alburquerque City Council approved a bill that set aside $1 million for security improvements, including additional security staff and bus stop maintenance

Seattle - King County Metro

King County Metro offers the following fare discounts:

- ORCA LIFT: An income-based reduced fare of $1 on Metro and many other transit systems around the Puget Sound region
- Regional Reduced Fare Permit (RRFP): Allows eligible senior riders, riders with disabilities and Medicare card holders to receive discounted fares (63.64% reduction; higher than FTA half fare basic requirement) on public transit in the Puget Sound region
- Subsidized annual pass: Allows eligible riders enrolled in at least one of six state benefit programs to travel on certain transit in the Puget Sound region at no cost
- Youth ORCA: Allows youth 18 and under to use transit in the Puget Sound region at no cost

In 2015, King County Metro launched ORCA LIFT, a reduced fare transit program for low-income riders, with the goal of improving physical and economic mobility for program users. Building on this program, King County Metro launched a fully subsidized ORCA LIFT pass for riders with the lowest incomes (at or below 200% of the Federal Poverty Level). To qualify, residents must send in an application and meet certain income criteria. The ORCA LIFT program reduces the fare from $2.75 to $1.50 or eliminates it for qualifying riders.

After introducing ORCA LIFT, King County Metro found that free fare pass holders used transit at double the rate of subsidized pass holders. Additionally, zero fare pass holders used transit more often even if they had not used it prior to the program. This suggests that zero fares expanded access to people who previously did not use transit. However, recipients of the program did not continue to use transit at the same rate after their enrollment ended, suggesting that the enrollment process may be a barrier to accessing discounted transit.

In addition to ORCA LIFT, King County Metro offers reduced fares for seniors and people with disabilities through the Regional Reduced Fare Permit, as well as a subsidized annual pass for people participating in specified social programs like Temporary Assistance for Needy Families and Supplemental Security Income.

Funding for ORCA LIFT comes from the Seattle Transit Measure, a 0.15% sales tax that expires in 2027. Approved in 2020, the sales tax generates around $3.9 million annually to fund transit service, capital projects, and transit access programs.

Los Angeles County - LA Metro

LA Metro offers the following fare discounts:

- Seniors 62+, Medicare recipients, and people with disabilities can receive up to 80% off regular Metro fares (higher than FTA half fare basic requirement)
- GoPass: K-12 and community college students at participating schools ride at no cost
- Low-Income Fare is Easy (LIFE): Households making under $41,150 receive 20 free rides per month
- College/University students save up to 80% off regular Metro fares
- Employer Pass Program: Provides commute benefits that save employers and employees money on passes while also providing tax benefits for the employer

LA Metro's fare program: In January 2022, LA Metro launched the Low-Income Fare is Easy (LIFE) program which offers discounts on weekly or monthly Metro passes. The program also includes 20 free rides with participating transit agencies. To qualify, riders must meet certain income requirements beginning with single household earnings less than $41,400 annually. It is estimated that 75% of Metros riders are from low-income households.

LA Metro also operates the GoPass pilot program, offering free transit for over one million K-12 and community college students in LA County. Compared to Metro's previous reduced fare student monthly passes, families of students in kindergarten through 12th grade who participate in the GoPass program typically saved $288 per student annually. According to LA Metro, participating community college students save $516 annually. In addition to these discounts, LA Metro offers an 80% discount for university students, a 50% discount for EBT recipients, an Employer Annual Pass, and up to 80% off for seniors and people with disabilities.

In February 2023, Metro announced a 12% increase in ridership in 2022 compared to 2021. Overall bus ridership increased 10% while rail ridership increased by 20%. More than 10 million trips were taken by LIFE pass holders in 2022, and GoPass holders took 11.7 million trips

LA Metro's fare subsidy programs are partially funded with Measure M, a half-cent sales tax that also funds traffic reduction projects, road repair, and transit expansion. Additional funding for GoPass comes from federal grants and cost sharing agreements between area schools and LA Metro.

Denver - Regional Transportation District (RTD)

RTD offers the following fare discounts:

- Senior Special Discount Card: Provides a 50% fare discount for people ages 65+ on all regular bus and train service (meets FTA half-fare basic requirement)
- Individuals with Disabilities Special Discount Card: Provides a 50% fare discount for individuals with disabilities on all regular bus and train service (meets FTA half fare basic requirement)
- LiVE Income-Based Fare Discount Program: Provides a 50% fare discount for individuals making at or below 250% of the FPL
- Zero Fare for Youth Pilot: Youth 19 and under ride at no cost between September 2023-August 2024

In January 2024, RTD lowered fares and consolidated fare zones so that passengers pay identical fares except for airport transit. RTD also expanded its discount programs, and now offers four discounts to offset transit costs for eligible residents. In September 2023, RTD launched Zero Fare for Youth, a one-year pilot program aimed at enhancing youth mobility and reducing transit costs for families. All passengers 19 and younger automatically qualify for Zero Fare for Youth. RTD does not require an application to verify eligibility for Zero Fare for Youth, and the only requirement is a government or school issued identification displaying the passengers age which is presented when boarding. However, passengers may also request a special RTD youth card.

RTD also operates the LiVE program, an income-based fare discount program that reduces fares by 50% for qualifying adults with incomes at or below 250% of the FPL. In addition to the LiVE program, RTD offers a 50% discount for seniors and people with disabilities.

The majority of RTD's $1 billion in annual revenue is derived from a 1% sales tax, with fares only making up a small portion. However, RTD is considering additional funding sources to ensure long term financial sustainability.

San Francisco - Bay Area Rapid Transit (BART)

BART offers the following fare discounts:

- Clipper START: Low-income adults earning 200% or less of the federal poverty level get 20% off fares
- Youth Clipper Card: Youth aged 5-18 get 50% off fares, while four years and younger ride at no cost
- Senior Clipper Card: Seniors 65 and over get 62.5% off fares (exceeds FTA half fare basic requirement)
- RTC Clipper Card: Passengers under 65 with qualifying disabilities get 62.5% off fares (exceeds FTA half fare basic requirement)
- Adult Clipper Card High Value Discount: Provides a 6.25% discount on cash value rides by buying $48 worth of value for $45 or $64 worth of value for $60
- Muni + BART monthly "A" Fast Pass

To reduce the cost burden of transit for adults aged 19-64, the Metropolitan Transportation Commission (MTC) launched the Clipper START pilot program. The program is designed to help adults whose household income is at or below twice the FPL. MTC is considering increasing the Clipper START discount from 20% to 50% in early 2024 due to community feedback.

In January 2024, BART and MTC announced a pilot program that offers discounts on transfers between the Bay Area's 15 different transit agencies. The maximum discount would be $2.50, which effectively makes second rides free on local buses.

The Clipper Start pilot is funded by MTC, which set aside $17 million from the CARES Act, the State Transit Assistance (STA) program, and the statewide Low-Carbon Transit Operations Program. MTC has committed to setting aside annual funding for the duration of the pilot, and it will also help fund the transfer discount pilot.

Southeastern Pennsylvania Transportation Authority (SEPTA)

SEPTA offers the following fare discounts:

- 50% discount for people with disabilities (meets FTA half fare basic requirement)
- Up to eight free trips per day for K-12 students
- Up to 80% off fares for university students
- Free fares for Seniors 65 and over (exceeds FTA half fare basic requirement)
- Free fares for children under 12 when accompanied by a fare-paying adult.

In August 2023, Southeastern Pennsylvania Transportation Authority (SEPTA) announced a two-year zero-fare pilot program that will provide free transit access to over 25,000 low-income Philadelphia residents. A recent assessment found that 39% of Philadelphians living in poverty cited transportation costs as their main barrier to employment. The program seeks to reduce transportation costs for people living at or below the federal poverty level, and improve access to employment, healthcare, social services, and more.

There is no application for the pilot program, and SEPTA sends preloaded cards to eligible residents who meet specific income criteria or who are enrolled in specific social service programs. Ninety percent of eligible residents will be randomly selected and automatically enrolled, and the remaining 10% will receive cards through community organizations. Because the program is a pilot, there is insufficient funding to distribute cards to all eligible residents. The main goal of the program is to evaluate the effectiveness of zero fares in Philadelphia, with the goal of expanding the program to more residents. The program will continue until August 2025, and then will be evaluated for expansion.

The zero-fare pilot is funded by $62 million set aside by Philadelphia City Council in the municipal budget. The remaining permanent discounts are funded by the Commonwealth of Pennsylvania, and through partnerships with participating school districts and universities. SEPTA and MTS have comparable farebox recovery ratios (17% and 18%) and provide similar transit options in their respective regions.

Summary of Peer Agencies

These case studies demonstrate how the peer agencies featured in this analysis have implemented reduced fare programs that seek to enhance transit accessibility in their respective regions. The agencies featured in this study were selected due to similarity to the San Diego region in population, farebox recovery ratio, passenger miles, and fleet size. The social and financial impact of reduced/zero fare programs in comparable regions is essential for informing modifications to the fare structure of transit agencies in San Diego County.

Each peer agency has implemented either permanent or temporary discounted fare structures. Currently, permanent reduced fare programs for low-income riders are offered by Los Angeles Metro, Seattle King County Metro, Denver RTD, and BART. Kansas City Area Transportation Authority (KCATA) and Albuquerque's ABQ Ride are the only peer agencies who have implemented long term zero-fare programs. Although an official end date has not been established, KCATA's zero fare program will continue into 2024, while ABQ Ride's zero fare program became permanent in 2023. Additionally, SEPTA launched a new income-based zero fare pilot program in 2023, and RTD Denver launched a new youth zero fare program.

Fare Metrics

Transit agencies use several key metrics to analyze revenue and costs. Farebox recovery ratio measures the percentage of operational costs covered by passenger fare revenue. This metric is calculated by dividing total fare revenue by total operational costs. Agencies with high farebox recovery ratios may prefer to offer a partially subsidized program over zero fare because fares cover a larger percentage of operational costs. Conversely, agencies with lower farebox recovery ratio may elect to eliminate fares, since fares do not significantly cover operational costs.

Fare revenue per capita helps inform pricing strategies by showing the average price paid for a fare. It is calculated by dividing total passenger fare revenue by service area population. Transit agencies use this important metric to inform fare structures and types of discount programs they can offer.

Fare Metrics – Tables and Figures

Figure 1.1 - 2021 Fare Data

Agency	KCATA	KC Seattle Metro	LA Metro	ABQ Ride	RTD Denver	MTS	NCTD	BART	SEPTA
Farebox recovery ratio	0.78%	9.76%	1.82%	2.83%	13.85%	16.43%	5.56%	9.88%	11.90%
Fare revenue per passenger mile	$0.02	$0.36	$0.04	$0.10	$0.27	$0.22	$0.21	$0.26	$0.35
Passenger miles per capita	42.28	90.90	71.63	23.05	99.75	86.67	25.94	274.59	125.75
Fare revenue per capita	$0.81	$32.69	$2.89	$2.35	$27.03	$19.46	$5.51	$72.06	$44.21

Source: National Transit Database, 2021 Transit Agency Profiles

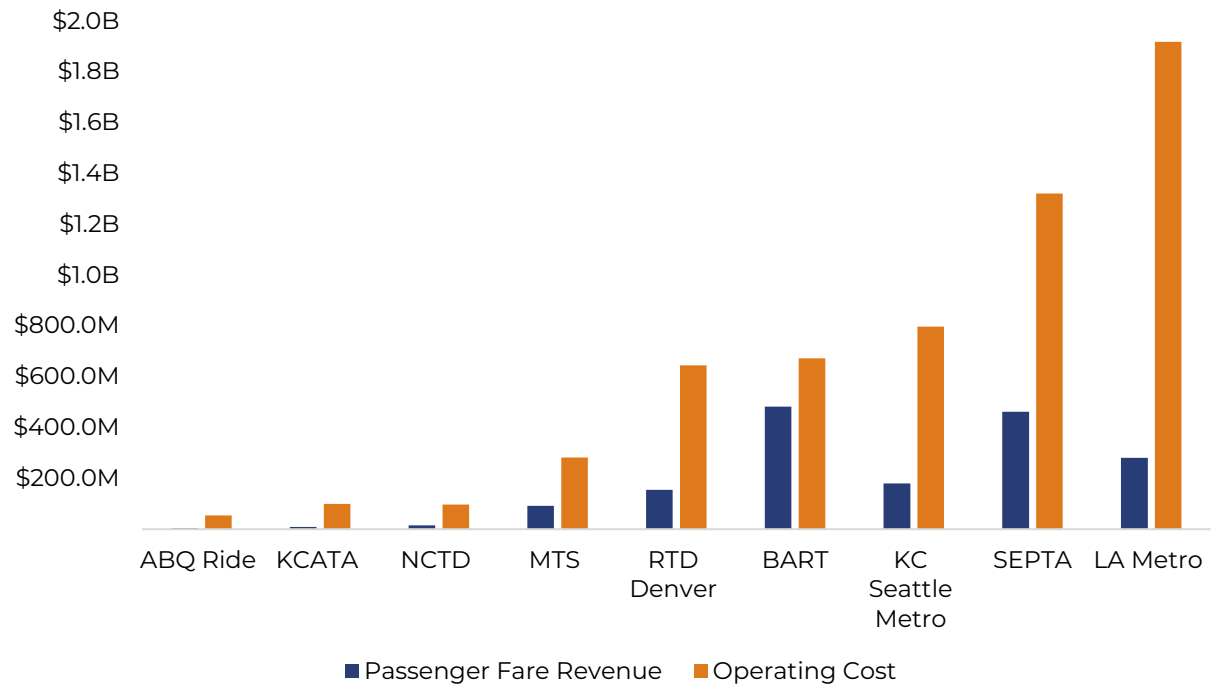
Figure 1.2 - 2022 Fare Data

Agency	KCATA	KC Seattle Metro	LA Metro	ABQ Ride	RTD Denver	MTS	NCTD	BART	SEPTA
Farebox recovery ratio	0.56%	8.93%	4.07%	1.42%	11.33%	18.31%	7.15%	19.76%	16.98%
Fare revenue per passenger mile	$0.01	$0.30	$0.07	$0.04	$0.21	$0.17	$0.20	$0.26	$0.31
Passenger miles per capita	62.16	111.58	$96.00	$28.28	$124.68	$132.89	$41.74	$603.16	$210.94
Fare revenue per capita	$0.90	$33.05	$7.06	$1.25	$25.78	$22.77	$8.52	$156.10	$66.06

Source: National Transit Database, 2022 Transit Agency Profiles

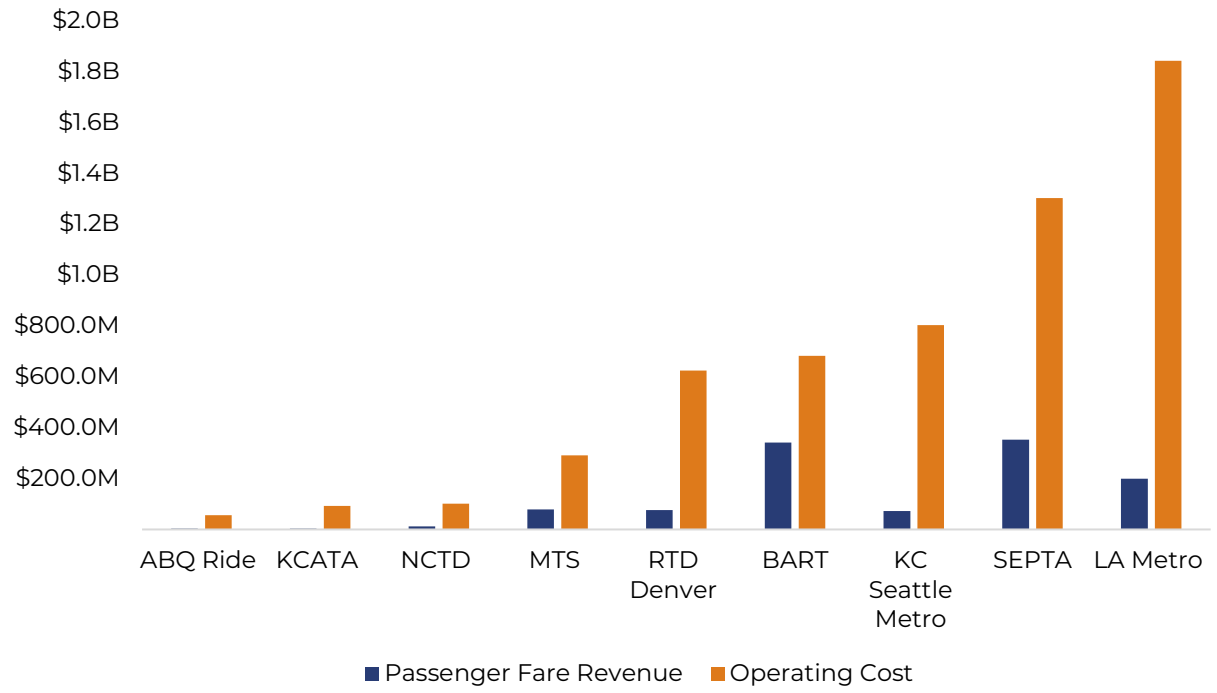
Fare Metric Figures

Figure 2.1 – 2019 Passenger Fare Revenue and Operating Costs



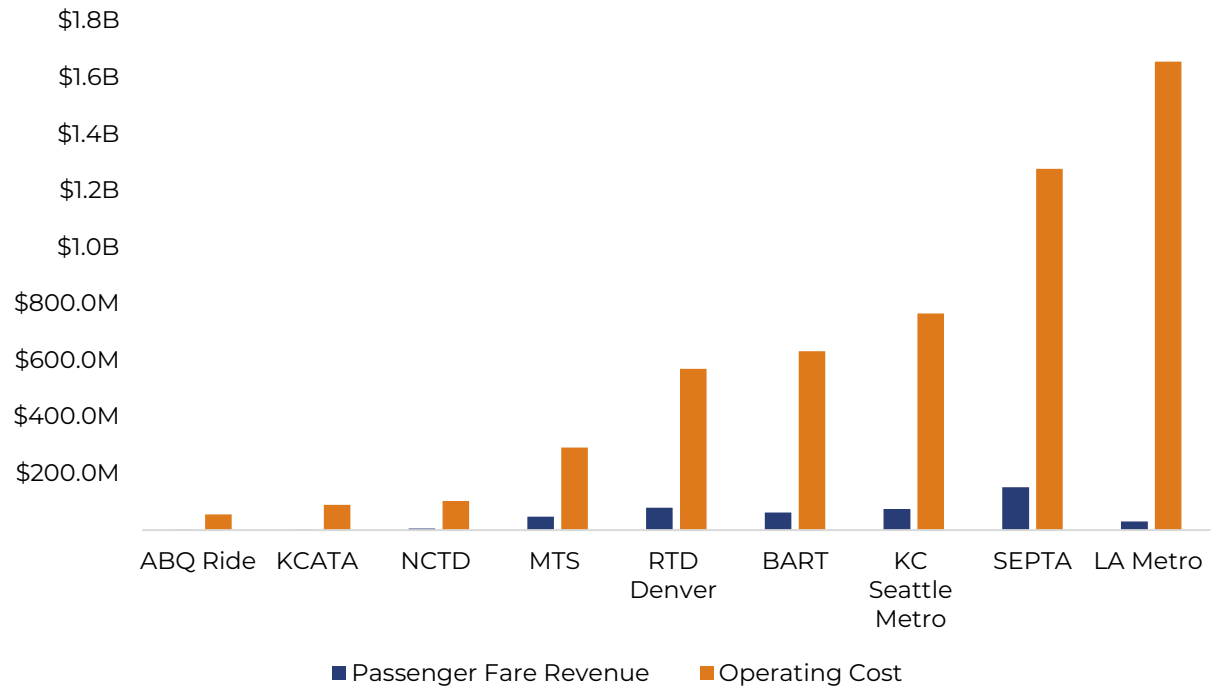
Source: National Transit Database

Figure 2.2 – 2020 Passenger Fare Revenue and Operating Costs



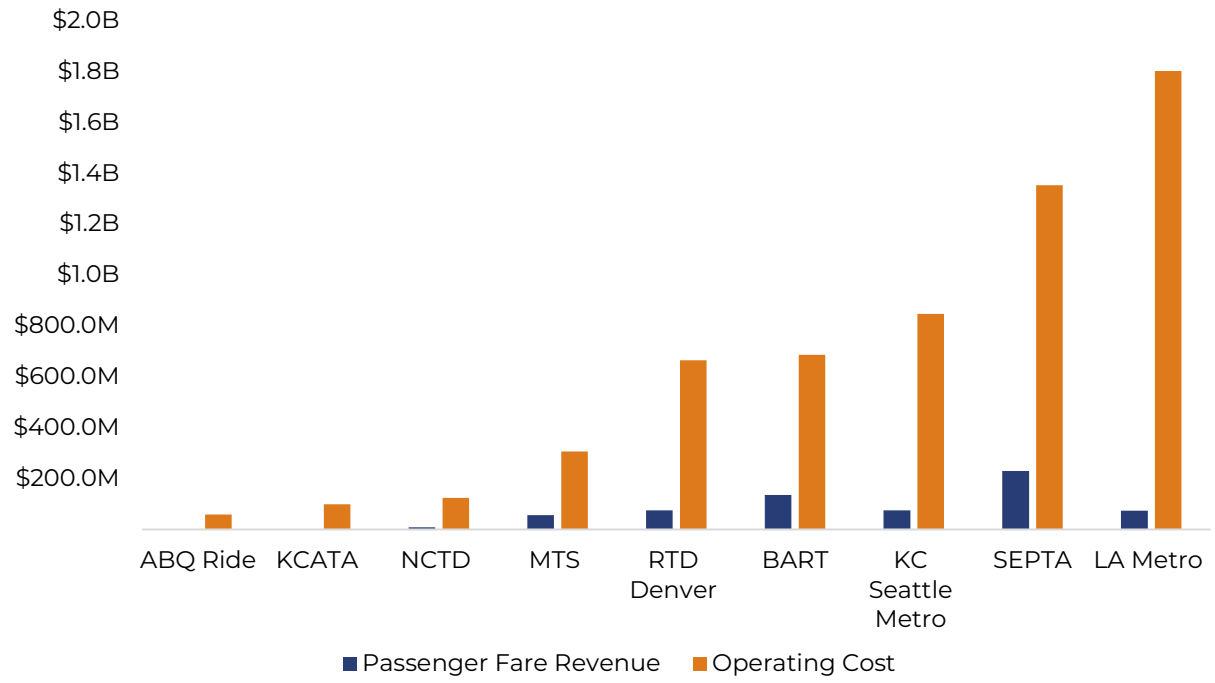
Source: National Transit Database

Figure 2.3 – 2021 Passenger Fare Revenue and Operating Costs



Source: National Transit Database

Figure 2.3 – 2022 Passenger Fare Revenue and Operating Costs



Source: National Transit Database

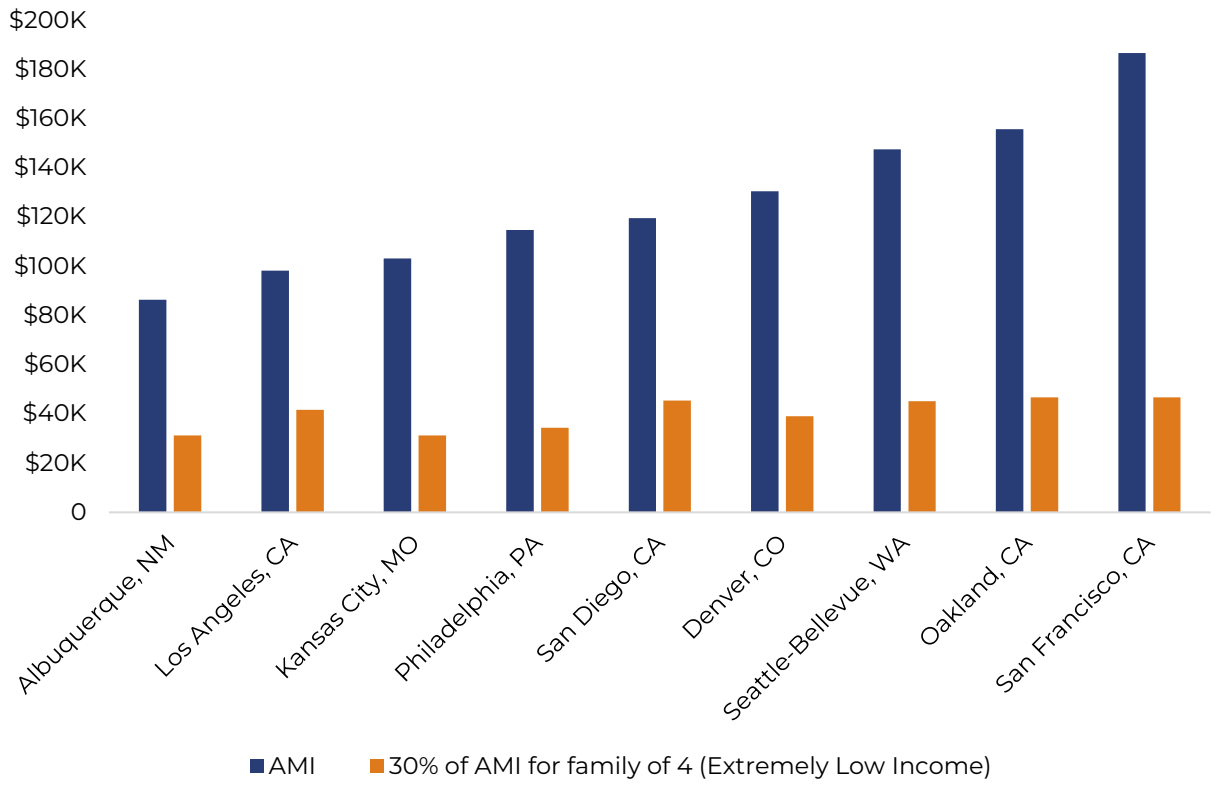
Effects of Income and Cost of Living on Fares

Regional differences in median income and cost of living affect fare pricing. Incorporating area median income (AMI) in fare reduction strategies is one way transit agencies can improve equity in the regions they serve. Agencies serving regions with high AMI benefit from developing fare reduction programs that target low-income riders, allowing them to make transit affordable for people with low-incomes while maintaining revenue from fare-paying passengers.

Agencies serving middle to high AMI regions with high fare revenue per capita do not benefit from a comprehensive zero-fare strategy, which creates a high operational revenue shortfall. In the San Diego region, MTS and NCTD serve high AMI regions. However, around one fifth of MTS riders earn less than $15,000 a year, while nearly three fifths earn less than $50,000 a year. Consequently, MTS passengers would benefit more from targeted discount programs for people with low incomes over zero fare, which would dramatically reduce operating revenue and have a detrimental effect on transit frequency and operations.

Several national surveys have shown that transit riders prioritize quality of transit service, including frequency and reliability, over free fares. Transit agencies in high AMI areas with relatively high ridership and fare revenues would benefit from prioritizing frequency and reliability over zero fare, while offering fare discounts for people with low incomes. This focus encourages continued and new ridership, maintains consistent revenue, and promotes transit equity.

Figure 3.1 – 2024 Area Median Income



Source: HUD

Findings

Transit agencies encounter a significant challenge in balancing expanded transit access, generating fare revenue, and maintaining reliable service. This analysis features both zero fare and income-based reduced fare programs, which use fare revenue per capita, fare box recovery, and household median income to determine rates. Based on the metrics in the tables above, it is more feasible for agencies with low fare box recovery ratios to adopt universal zero fare programs, as a smaller percentage of operating expenses are covered by fare revenue.

However, service reduction is an unintended consequence of fare elimination which can counteract equity gains achieved through zero fares. In contrast, agencies with high farebox recovery ratios benefit from a larger share of passenger fare revenue. Therefore, it is more feasible for agencies with high farebox recovery to reduce fares for specific passenger groups to preserve fare revenue and reliability of transit. Furthermore, transit agencies may seek to preserve fare revenue in other ways, such as by making transit safer, cleaner, and more frequent.

Many of the featured agencies identify and enroll discount recipients through income-based means testing, a common practice in the provision of public benefits. However, it is paramount that administrative and transaction costs of enrollment do not outweigh the benefits of discounts. Where verification is required, such as for people with low-incomes or disabilities, reducing paperwork and in-person appointments can help remove barriers to enrollment, while also lowering administrative costs and making the provision of services more equitable. LA Metro and King County Metro, two transit agencies with high ridership, require enrollment and verification to access low income and disability discounts. Both applications may be completed online, which reduces barriers to access by making the application process efficient and accessible. In contrast, SEPTA requires that all reduced fare applications be submitted in person, which can create barriers to accessing discounts.

To expedite the verification of youth and students, agencies may reduce administrative and transaction costs by using existing government and school issued IDs to verify eligibility when boarding. Allowing for a wide range of verification options beyond the traditional fare card eliminates administrative costs associated with verifying eligibility. This policy also eliminates transaction costs associated with accessing fare discounts, which can create barriers to access for youth with limited resources. Another option is to delegate distribution and verification of transit cards to schools, which may help reduce the transaction costs associated with enrolling riders in discount programs. RTD currently uses state or school issued identifications to verify youth eligibility, while LA Metro delegates distribution of youth passes to schools and verifies eligibility with a short online registration process. The benefit of using identifications to verify eligibility is low administrative costs, but the cost is shifted to bus drivers who must manually verify age at boarding. LA Metro incurs some administrative costs upfront, but the benefit is a seamless verification process when boarding.

If income verification is required, transit agencies have various options for determining eligibility conditions. Many government services use a variation of the Federal Poverty Line (FPL) as a guideline to determine income requirements for benefits. However, each featured agency employs a more generous income requirement because the FPL fails to account for geographic differences in cost of living. The income requirement for King County Metro is 200% of the FPL, 200% for BART, 250% for Denver RTD, and 150% for SEPTA. LA Metro does not specify their FPL percentage to qualify for their program, and instead uses a flat annual income limit based on household size. The limit is $48,550 for a one-person household, which is about 320% of the FPL.

Employing an income limit two to three times higher than the FPL ensures that both households below the poverty line and cost-burdened households qualify for transit discounts. This consideration is essential for meeting equity objectives because the income threshold for cost-burdened households changes depending on geographic location.

Another way to tailor income thresholds to different regions is by using a percentage of AMI, a metric used by HUD in the provision of housing benefits. The HUD AMI calculates low-income thresholds for each U.S county, which provides accurate income levels adjusted for regional differences.

The two remaining agencies featured in this study, KCATA and ABQ Ride, implemented universal zero-fares to remove the cost barrier for all riders regardless of income. Both Kansas City and Alburquerque have higher than average levels of people living below the FPL, at 15% and 16.2% of the population respectively.

Conclusion

This analysis examined nine transit agencies who took different approaches to the provision of fare discounts based on various factors. Each of the featured agencies serves populations with unique characteristics and needs, requiring individual approaches to fare discounts. This study demonstrates that there is no universal approach to providing fare discounts. Conversely, an effective fare discount program must consider local factors such as local median income, size of transit reliant population, farebox recovery ratio, income levels of riders, passenger perceptions of comfort and safety, transit operator safety, fare collection, and administrative costs of providing discounts.

Based on the findings of the featured case studies as well as agency findings, MTS and NCTD would not benefit from adopting a universal zero fare program due to high local AMI and reliance on fare revenue for covering a portion of operating costs However, a sizeable number of transit users are low income; three fifths of MTS passengers make less than $50,000 a year, signaling a need for programs which reduce transit cost burden for passengers who do not qualify for a youth or SDM discount.

A discount program targeted at low-income riders improves transit equity by reducing the financial burden of transportation costs. However, it is paramount that discount programs do not result in reductions in service due to loss of revenue, which places an undue burden on transit-reliant riders. Consequently, future discount programs should be paired with improvements to frequency and reliability—two priorities for all transit riders regardless of income level.

Appendix 2: Stakeholder Engagement Final Report

SANDAG Fare Equity Study –

I. Overview of Transit Fare Discount Study

As the regional metropolitan planning agency, our goal is to help more people in the region get to their destinations: this includes making transit more affordable. This will provide more travel options for people while reducing greenhouse gas emissions and the amount people are driving. In turn, it will help our region meet the state's climate requirements, which we have to meet to keep getting important funding for local transportation projects.

Our 2021 Regional Plan discusses reduced/free fares as a potential program, and in 2022, we launched a pilot program offering free transit for youth 18 and under called the Youth Opportunity Pass. This program has proven to be very successful, and it has been extended twice while we also seek a permanent way to fund it. To explore additional programs, we carried out a Transit Fare Discount Study (the study). Through this, we researched other types of programs we could offer in the future to give specific groups of transit riders free or reduced fares. The study analyzed fare structures of similar transportation agencies, as well as income data from the Federal Reserve Bank FRED database and the U.S Census Bureau to determine whether offering certain types of transit fare discount programs would encourage more people to use public transit more and change travel behavior. We also collected feedback from the public about their priorities while informing them about potential funding limitations. The research conducted and feedback gathered in this study will be used to inform part of the 2025 Regional Plan.

II. Purpose of the Public Outreach Program Report

Our goal for connecting with the public through this study was to better understand their priorities for discounted fare programs and transportation investments. We engaged with the public throughout the San Diego region, with special emphasis on traditionally underserved populations (including low-income, minority, and limited English proficiency populations). We gathered input from key stakeholders and the community through:

- Presentations to SANDAG Working Groups, including the Mobility Working Group and Social Equity Working Group
- Contracting with a group of community-based organizations (CBOs) who provide resources and/or advocacy for historically underserved populations
- Pop-ups at community events in partnership with these CBOs
- Tabling at transit centers
- Distributing a survey

III. Stakeholder Engagement

We presented at several SANDAG working group meetings, providing an overview of the study, project updates, and asking for their input on our outreach process. The membership of these working groups includes community and government agency staff throughout the region who are uniquely able to provide input reflecting varying perspectives. The team attended the following meetings:

- SANDAG Mobility Working Group (November 9th, 2023)
  Includes representatives from planning staff of the region's 18 cites, the County of San Diego, the region's transit operators (MTS and NCTD), the Port of San Diego, and the San Diego County Regional Airport Authority
- SANDAG Social Equity Working Group (July 13, 2023, and November 16, 2023)

Includes representatives from 11 community-based organizations (CBOs) or serving underserved and underrepresented communities across the region

IV. CBO Committee

In addition, we created a committee of social equity CBO staff members to support outreach efforts.

These groups included:

- El Cajon Collaborative
- Mid-City CAN
- Vista Community Clinic
- City Heights CDC

We met with this committee and sent them materials so they could refine our outreach tactics and messaging, ensuring these were accessible for their members. We partnered with these CBOs and attended community events in each of their service areas. A total of six public outreach events were attended by the outreach team in coordination with CBO partners, including an extra opportunity that was provided by a member of the Social Equity Working Group, Chula Vista Community Collaborative, that was not a member of our project CBO committee. The details and locations of these events are discussed in the section below.

V. Public Outreach

We gathered feedback in November and December 2023 in a variety of ways: this included pop-up events, tabling at transit centers, website and email updates, an online survey, and posters and materials translated into several languages. Our initial goals for this outreach were 1,000 survey responses and 500 in-person participants. We significantly surpassed these goals with a total of 2,053 survey participants and 620 touchpoints across pop-up events.

a. Community Event Pop-ups

We chose locations for pop-up events based on input from the SANDAG CBO Committee and embedded our outreach within existing events (e.g., a street fair, resource fair, community meeting, or holiday event). At these events, we informed the public about the study, the possible

trade-offs needed to pay for more reduced/free transit fares programs and collected their input on types of transit fare discount programs. The pop-ups included two interactive activities. Paper copies of the Transit Fare Discount Study survey were also provided as an option to participate and a QR code handout provided a link to the survey online for members of the public who couldn't stay very long at the tables. Informational materials were translated into seven languages to engage community members with limited English proficiency and were provided at all events.

Event Participation

Community-Based Organization (CBO)	CBO Coordinator	Date	Event	Participants
Chula Vista Community Clinic	Jovita Arellano	11/14	Collaborative Partners Meeting	50
El Cajon Collaborative	Carol Lewis	11/15	El Cajon Collaborative's Connecting Families to Resources	15-20
	Lizbeth Cobain	11/18	El Cajon Valley High School Resource Fair	54
Mid-City CAN	Lexxus Carter	12/03	Snowy Wonderland	85
Vista Community Clinic	Carla Muñoz	12/09	Escondido Holiday Festival	70
City Heights CDC	Juanita Castaneda	12/09	A Kimball Holiday	120

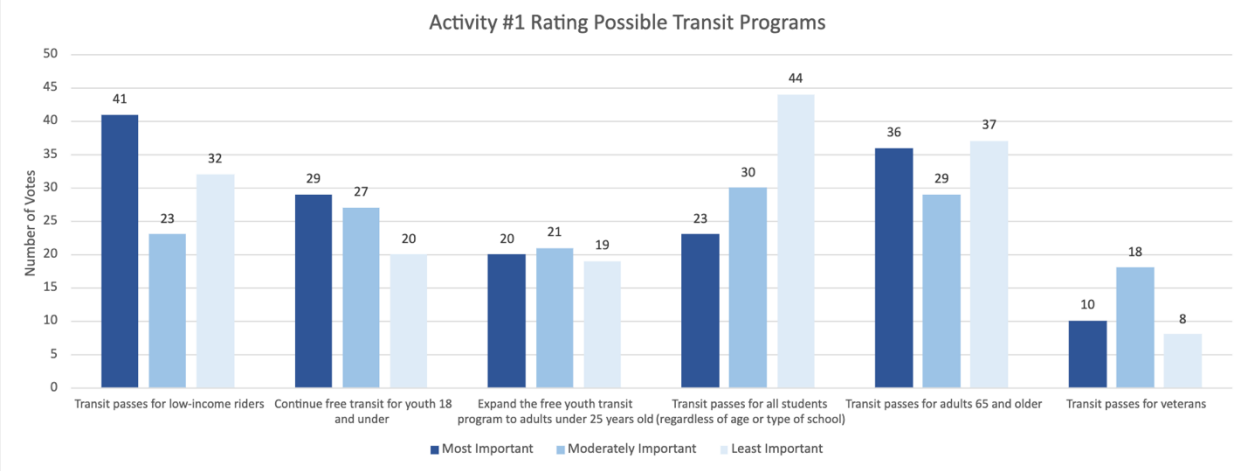
Given that the pop-up activities took place at high-traffic events with large groups, activity board #1 proved to be the most engaging and useful for collecting input. Activity #2 was utilized when participants had more time to engage. The following describes each of the activities:

Pop-up Activity #1

In this activity, participants were asked to choose their top three priorities for transit discount programs in their community. The list of possible transit program options were:

- Transit passes for low-income riders
- Continuing the Youth Opportunity Pass program
- Expanding the Youth Opportunity Pass program to adults 25 and under
- Transit passes for students
- Transit passes for adults 65 and older
- Transit passes for veterans

The participants used stickers labeled 1-3 and put these on the programs that they believed were the first, second, and third most important groups in need of a discount program. After each event, input was documented. The chart below shows the results.



Of the programs identified as most important, the top 3 target groups for discounts include:

The top 3 programs ranked as most important:

- Transit pass for Low Income riders (41)
- Transit passes for adults 65 and older (36)
- Continue free transit for youth (29)

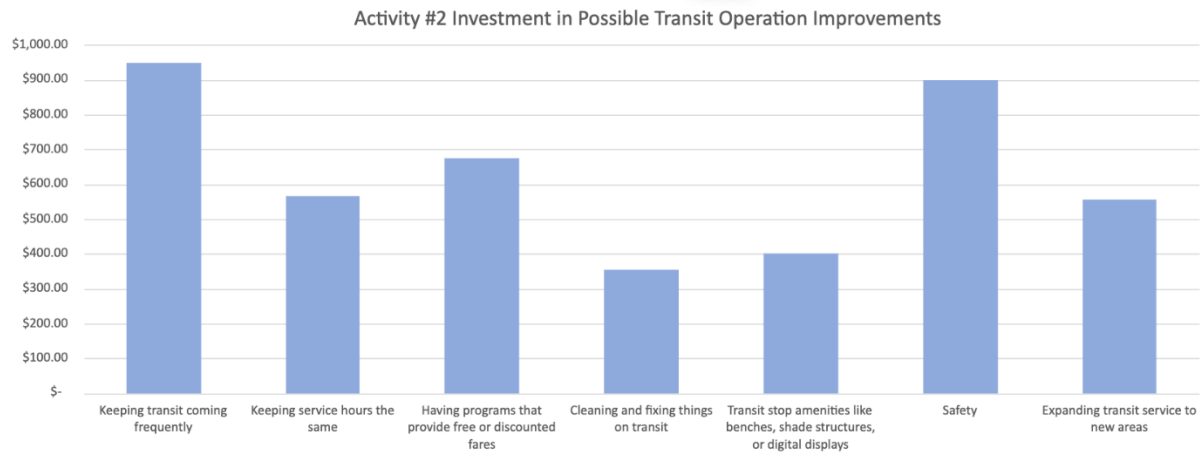
Pop-up Activity #2

This activity asked participants to share their preferences for where to invest transit operating funds in a budgeting activity. Each person was given 100 fake “dollars” to “spend” between different categories of transit improvements based on their priorities. This input was documented throughout each event.

The list of potential improvements included:

- Transit frequency

- Hours of service
- Free or discounted transit fares
- Cleaning and fixing things on transit
- Additional transit stop amenities
- Safety
- Expanding locations of service



The top three areas where participants prioritized funding were:

1. Keeping transit coming frequently
2. Safety
3. Having programs that provide free or discounted fares

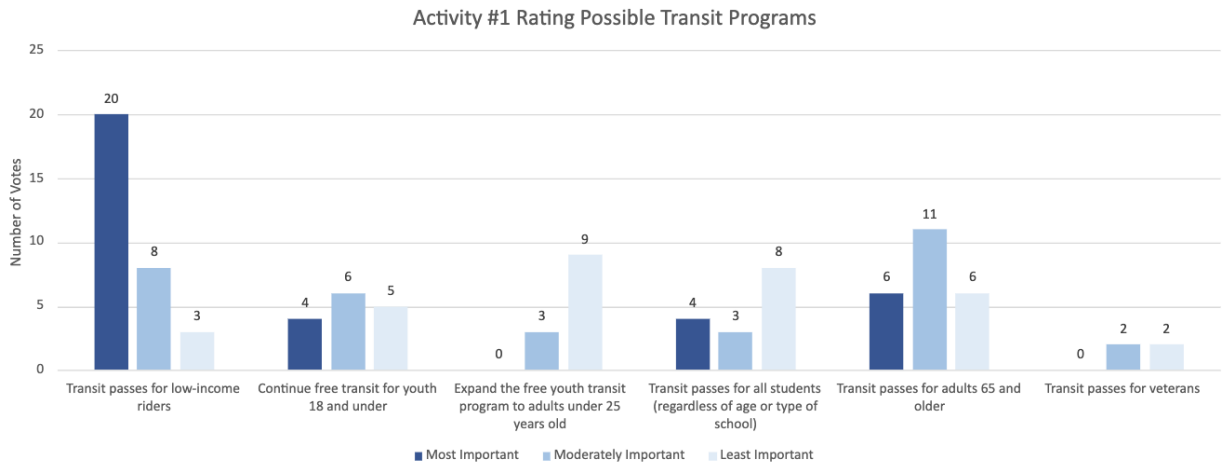
b. Transit Centers

With input from the region's transit operators, MTS and NCTD, the SANDAG team selected four high-traffic transit centers throughout the region to hold tabling pop-ups in social equity focus communities. We used the same activities and materials as the community events to collect feedback.

Transit Center Participation

Transit Center	Location	Date	Time	Touchpoints
Vista	240 N Santa Fe Ave, Vista, CA 92083	12/12	3:00 pm – 6:00 pm	50
Oceanside	290 S Cleveland St, Oceanside, CA 92054	12/19	3:00 pm – 6:00 pm	25
Euclid Avenue (San Diego)	450 Euclid Ave & Market St, San Diego, CA 92102	12/20	3:00 pm – 6:00 pm	65
Iris Avenue (San Diego)	3120 Iris Ave, San Diego, CA 9154	12/21	3:00 pm – 6:00 pm	90

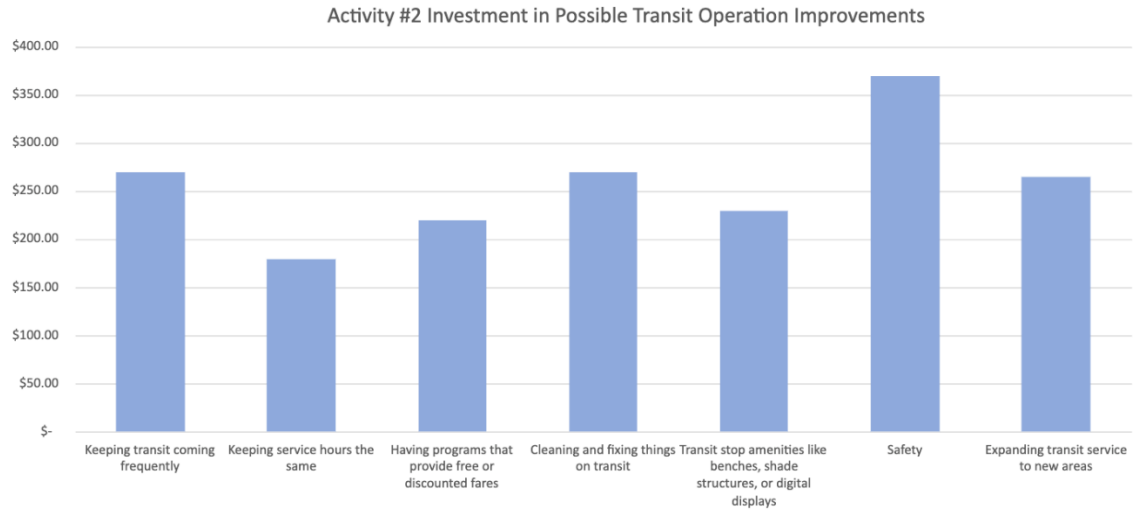
The outreach team engaged with the public and documented results from Activity #1 and #2 in the same way as the community events. The two charts below summarize this input.



Of the programs identified as most important, the top 3 target groups for discounts include:

The top 3 programs ranked as most important:

1. Transit passes for low-income riders (20)
2. Transit passes for adults 65 and older (6)
3. ***TIE*** Transit passes for all students (regardless of age or school) **and** Continue free transit for youth 18 and under (4)



Responses from the budget activity prioritized funding for:

1. Safety
2. ***TIE*** Keep transit coming frequently **and** Cleaning and fixing things on transit
3. Expanding transit service to new areas

c. Online and Paper Survey

The survey was made available in seven languages and ran from November 15, 2023, to January 2, 2024. To encourage people to take the survey, participants were offered entry into a sweepstakes with an opportunity to win one of ten $50 Amazon gift cards. The survey was promoted on SANDAG's social media platforms, through an alert banner in the OneBusAway transit app, in eblasts, and through community-based organization staff reaching out to their members. Appendix A includes the specific survey questions provided online and in paper handouts collected from participants at in-person events who didn't wish to complete the poster activities. After the survey closed, 10 sweepstakes winners were randomly selected, notified, and sent their Amazon gift cards.

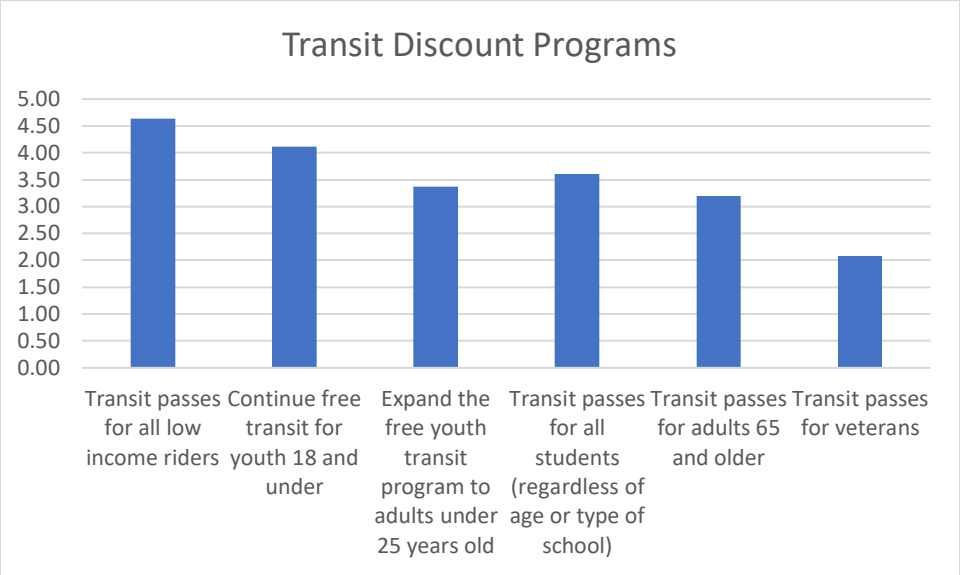
The survey asked respondents about their transit use, whether they had access to a car, and whether they had ever not taken transit because of the cost. More than 2/3 of survey respondents rode transit regularly (every day or every week), more than 2/3 had access to a car, and nearly 1/3 had been unable to take a transit trip because of the cost.

The survey also asked for feedback similar to questions asked at the pop-ups. Participants ranked the following programs from most helpful (1) to least helpful (6):

- Transit passes for all low-income riders
- Continue free transit for youth 18 and under
- Expand the free youth transit program to adults under 25 years old
- Transit passes for all students (regardless of age or type of school)
- Transit passes for adults 65 and over
- Transit passes for veterans

The top three programs prioritized were:

1. Transit passes for all low-income riders
2. Continue free transit for youth 18 and under
3. Transit passes for all students (regardless of age or type of school)

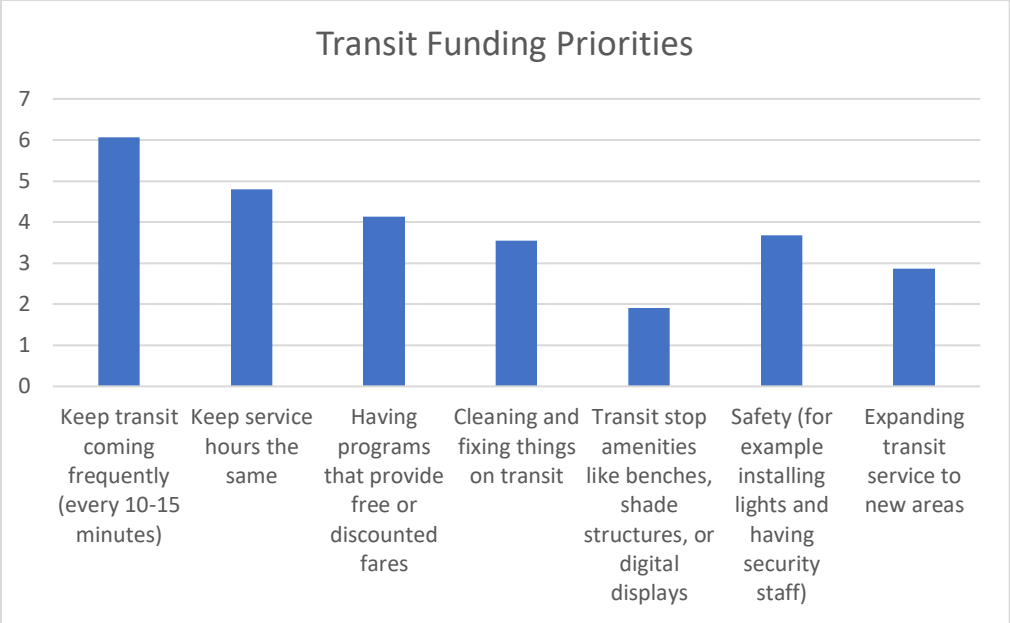


The survey also asked which of the following aspects of public transit were most important to respondents:

- Keeping transit coming frequently (every 10-15 minutes)
- Keeping service hours the same
- Having programs that provide free or discounted fares
- Cleaning and fixing things on transit
- Transit stop amenities like benches, shade structures, or digital displays
- Safety
- Expanding transit service to new areas

This question explained that public funding is limited and asked them to choose their priorities with this in mind. Respondents ranked each of these choices from 1 (most important) to 7 (least important). The three most important items were as follows:

1. Keeping transit coming frequently
2. Keeping service hours the same
3. Having programs that provide free or discounted fares



VI. Summary

Based on this input, we learned:

1. The top priority for free or discounted transit fares from all participants (survey, community pop-ups, and transit pop-ups) was **free or discounted transit fares for low-income riders.**

2. In-person participants ranked **free or reduced transit fares for adults 65 and older** as their second highest priority, while survey respondents online ranked continuing the **free transit program for youth 18 and under** as their second choice.

3. In-person participants **chose the free transit program for youth 18 and under** as their third priority and survey respondents favored **free transit for students** as their third priority.

4. **Keeping transit coming frequently** was important to all participants. It was ranked as the most important priority for transit funding by survey respondents and participants at the community pop-ups. It was the second most important priority for participants at transit pop-ups (tied with cleaning and fixing things on transit).

5. The transit riding experience was important to participants at the transit pop-ups. They ranked **transit safety** as their top priority and **cleaning and fixing things on transit** as their second priority (tied with frequency).

4. Both community event and survey participants overall ranked **free or discounted fares** as the third most important priority while transit center pop-up participants did not include this in their top three priorities. Instead, they prioritized **expanding transit service to new areas** as their third most important priorities

VII. Impacts on the 2025 Regional Plan

A proposed program to offer free or discounted fares for low-income populations (with the YOP in continuance) in our region will be included in the 2025 Regional Plan. The SANDAG Board of Directors will determine whether there is funding to implement this plan without

negatively impacting current transit operations, ensuring that we continue to maintain frequency, safety, and service hours.

APPENDIX A

Transit Fare Discount Study Survey

Survey Questions

1. What is your zip code?
2. How often do you use public transit? (for example the bus, trolley, or train?
    a. Every day
    b. Every week
    c. A few times a month
    d. A few times a year
    e. I don't use public transit
3. Does your household have access to a car to get places? If so, how many cars?
    a. No
    b. Yes, 1
    c. Yes, 2
    d. Yes, more than 2
4. In the last month, was there a time that you or someone in your household considered using transit but decided not to because of cost?
    a. Yes
    b. No

We are studying programs to make transit more affordable, including free or discounted transit passes for certain groups of people.

5. Which type of free or discounted program would help you and your community the most? (Please rank these, 1 being the most helpful, 6 being the least helpful)
    a. Transit passes for all low-income riders
    b. Continue free transit for youth 18 and under
    c. Expand the free youth transit program to adults under 25 years old
    d. Transit passes for all students (regardless of age or type of school)
    e. Transit passes for adults 65 and older
    f. Transit passes for veterans
6. It's common that we have limited funding to keep public transportation running smoothly. Keeping that in mind, what parts of public transportation are most important to you? (1 being most important, 7 being the least important)
    a. Keeping transit coming frequently (every 10-15 minutes)
    b. Keeping service hours the same (so the bus or trolley comes early in the morning, later in the evening, and on weekends)
    c. Having programs that provide free or discounted fares
    d. Cleaning or fixing things on transit
    e. Transit stop amenities like lighting, shade structures, or digital displays
    f. Safety (for example, installing lights and having security staff)
    g. Expanding transit service to new areas
7. Do you want to enter a sweepstakes to win $50 Amazon gift card as a thank you for taking this survey?
    a. Yes

b. No

These next questions will help us understand who took the survey to make sure we get feedback from a variety of people. Please skip anything if you don't feel comfortable sharing.

8. What year were you born?
9. How many people live in your household?
10. What is your annual household income?
11. What is your race or ethnicity? (You can choose more than one)
    a. Asian
    b. Black/African American
    c. Hispanic/Latine
    d. Native Hawaiian or other Pacific Islander
    e. Native American or Alaska Native
    f. Other
    g. Prefer not to say

If you check "Other" please describe.

12. Do you want to stay updated about our future Transit Fare Discount Programs? (Optional)
    a. Yes Please provide email:
    b. No thanks

Appendix 3: Fare Equity Options & Considerations Report

SANDAG Fare Equity Study – Fare Equity Scenario Analysis

Fare Equity Options

There are several implementation options, opportunities, and challenges to consider when evaluating fare equity strategies, which include zero-fare or reduced-fare transit. The following information describes the continuum of options across the following four main categories of opportunities and challenges—all based on industry examples:

1. Community Benefits and Access to Transit
2. Ridership
3. Transit Service Delivery
4. Cost and Revenue

Fare Equity Implementation Options

Figure 1 shows the most common implementation options for various far equity strategies, ranging from limited scope on the left to the broadest scope on the right. The options are not mutually exclusive, and a transit system could implement multiple options together. Either zero- or reduced-fare policies could be developed for each option as well.

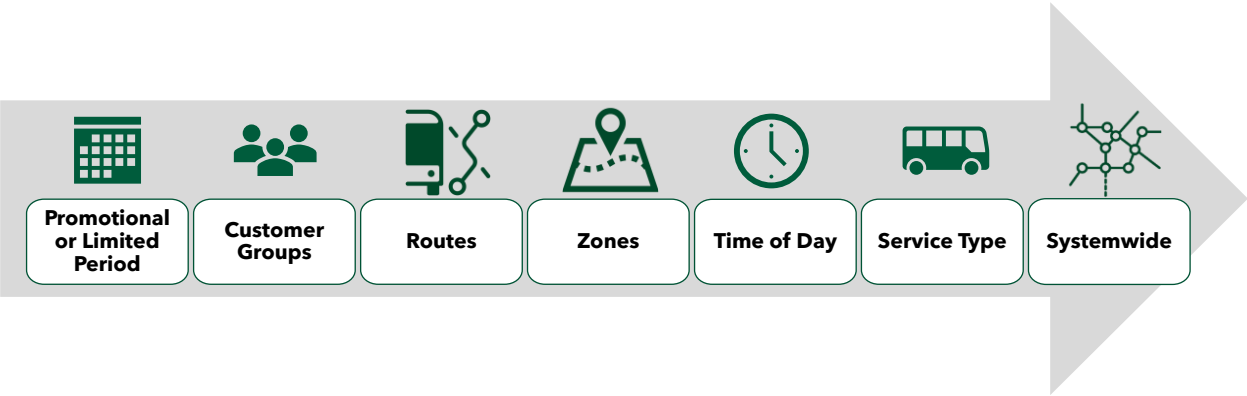


Figure 1: Continuum of Implementation Options

The following describes each of the implementation options, along with examples:

Promotional or Limited Time Period	
Description	Zero- or reduced-fare rides during a pre-defined limited time period to promote a behavior shift towards public transit.
Peer Examples	Each peer offers (or has offered in the past) free ride promotional days.
Member Agency Practices	Free Ride Day (in association with California Clean Air Day); Holiday Friends Ride Free program; free all-day rides on Rosa Parks' Birthday and Election Day
Other Use Cases	Free ride days often coincide with particular holidays or events, or constitute a promotional period when launching new service.

Customer Groups	
Description	Zero- or reduced-fare programs for customers that meet eligibility requirements such as low income or means-based; age (seniors, children); persons with disabilities; K-12 students; university students, faculty and staff; veterans; or employees of a specific organization or employer. U.S. transit systems that receive federal funding are required to offer, at minimum, half fares to the older adults and people with disabilities during off-peak travel. Programs have associated administrative costs

	to accept participants, issue fare cards or passes as applicable, and verify eligibility. Low-income or means-based reduced-fare programs in the U.S. typically require individuals to have incomes of no more than 150% to 200% of the federal poverty line to qualify, and can align with existing federal programs that verify low-income status, such as the SNAP food benefits program.
Peer Examples	- TriMet (Portland, OR): Honored Citizen Program (reduced fares for seniors, persons with disabilities, medicare recipients, and low-income); Youth Program (reduced fares for ages 7-17) - SFMTA (San Francisco, CA): For seniors and persons with disabilities – reduced fares at all times and zero-fare through Clipper program; Free Muni for All Youth zero-fare program; Reduced Lifeline Pass and Clipper START program for low-income; Access Pass zero fare program for persons experiencing homelessness - VTA (San Jose, CA): Reduced fare programs for seniors, persons with disabilities, and youth - DART (Dallas, TX): Reduced fare programs for seniors and persons with disabilities - LA Metro: Low-Income Fare is Easy (LIFE) program – zero-fare for low-income (reduced fares apply outside of program); zero-fare for K-12 and community college students with GOPass - Sound Transit (Seattle, WA): Low-income ORCA LIFT reduced fare program; reduced fares for seniors and persons with disabilities; zero fare for youth under 18 - Metro Transit (Minneapolis, MN): Reduced fares for seniors, persons with disabilities, and medicare recipients - Tri-Rail (South Florida): N/A (it appears that standard fares have been adjusted to match the reduced fares) - Sun Tran (Tucson, AZ): N/A (currently zero-fare systemwide) - OmniTrans (San Bernardino, CA): Reduced fares for seniors, veterans, and persons with disabilities; zero-fare for K-12 students - RTA New Orleans: Priority Rider reduced fare program for seniors and persons with disabilities; reduced fares for youth; zero fare for children under 5, uniformed police officers, and uniformed firefighters - Trinity Metro (Fort Worth, TX): Reduced fare programs for seniors, persons with disabiities, and youth - SacRT (Sacramento, CA): Reduced fare program for seniors, persons with disabilities, and K-12 students; RydeFreeRT

	zero-fare program available for most K-12 students (based on school district) - HART (Tampa Bay, FL): Reduced fare programs for seniors, persons with disabilities, medicare recipients, and youth - Metrolink (Southern California): Reduced fare programs for seniors, persons with disabilities, medicare recipients, and youth; reduced fares for active military; zero-fare for uniformed law enforcement officers
Member Agency Practices	Reduced fare programs currently exist for seniors, persons with disabilities, medicare recipients, students of local colleges/universities (pass discounts only), and youth ages 6-18. For all of these groups, eligibility must be verified. No fare charged for children under 5, and all youth under 18 ride free with a youth PRONTO app account. Also suggests potential fare equity program for veterans (not yet active).
Other Use Cases	Fairfax County and Fairfax City Student Bus Pass Program (Fairfax, VA), Kids Ride Free Program (Washington, D.C.)

Routes

Description	Zero- or reduced-fare rides on specific routes in the transit system. Routes often serve a specialized purpose such as tourism, downtown circulation, or an employment area / specific employer.
Peer Examples	- TriMet (Portland, OR): N/A - SFMTA (San Francisco, CA): N/A - VTA (San Jose, CA): N/A - DART (Dallas, TX): N/A - LA Metro: N/A - Sound Transit (Seattle, WA): Reduced fares for Tacoma Link Light Rail - Metro Transit (Minneapolis, MN): - Tri-Rail (South Florida): N/A - Sun Tran (Tucson, AZ): N/A (currently zero-fare systemwide) - OmniTrans (San Bernardino, CA): N/A - RTA New Orleans: N/A - Trinity Metro (Fort Worth, TX): N/A - SacRT (Sacramento, CA): N/A - HART (Tampa Bay, FL): N/A - Metrolink (Southern California): N/A
Member Agency Practices	All MTS Sorrento Valley Coaster Connection routes are zero-fare
Other Use Cases	Brisbane, CA free commuter shuttle, South City Shuttle (South San Francisco, CA), New York MTA currently operating two zero-fare routes in each borough, Charm City Circulator (Baltimore, MD), Bethesda

	Circulator (Maryland), King Street Trolley (Alexandria, VA), Leesburg Safe-T-Ride (Leesburg, VA), Merrimack Valley Regional Transit Authority—three zero-fare downtown routes (Lawrence, MA)

Zones

Description	Zero-or reduced-fare rides for customers that travel within a predefined geography or zone. Enforcement is needed to verify customers entering or exiting the zone pay fares.
Peer Examples	- TriMet (Portland, OR): Portland Fareless Square was discontinued in 2012 - SFMTA (San Francisco, CA): N/A - VTA (San Jose, CA): N/A - DART (Dallas, TX): N/A - LA Metro: N/A - Sound Transit (Seattle, WA): N/A - Metro Transit (Minneapolis, MN): Zero-fare for Nicollett Mall Zone; Reduced fare for Downtown Zone - Tri-Rail (South Florida): N/A - Sun Tran (Tucson, AZ): N/A (currently zero-fare systemwide) - OmniTrans (San Bernardino, CA): N/A - RTA New Orleans: N/A - Trinity Metro (Fort Worth, TX): N/A - SacRT (Sacramento, CA): N/A - HART (Tampa Bay, FL): N/A - Metrolink (Southern California): N/A
Member Agency Practices	N/A
Other Use Cases	UTA Free Fare Zone (Salt Lake City, UT), King County Metro Ride Free Area (Seattle, WA; discontinued in 2012)

Time of Day

Description	Zero- or reduced-fare rides at defined times of the day such as off-peak or weekend when there is available capacity. This option can be used to incentivize travel during less congested times and provide benefits to non-commuter trips.
Peer Examples	- TriMet (Portland, OR): N/A - SFMTA (San Francisco, CA): N/A - VTA (San Jose, CA): N/A - DART (Dallas, TX): Reduced fares for midday service (9:30am-2:30pm) - LA Metro: N/A - Sound Transit (Seattle, WA): N/A

	- Metro Transit (Minneapolis, MN): - Tri-Rail (South Florida): Reduced fares on weekends and holidays - Sun Tran (Tucson, AZ): N/A (currently zero-fare systemwide) - OmniTrans (San Bernardino, CA): N/A - RTA New Orleans: N/A - Trinity Metro (Fort Worth, TX): N/A - SacRT (Sacramento, CA): N/A - HART (Tampa Bay, FL): N/A - Metrolink (Southern California): N/A
Member Agency Practices	N/A
Other Use Cases	CTransit Weekend Wheels zero-fare local bus service during summer 2021 (CT), zero-fare off-peak service (Mercer County, NJ; historical test in 1979)

Service Type

Description	Zero- or reduced-fare rides on subsystem transit modes such as local circulators, light rail/streetcar, or local bus but not premium services.
Peer Examples	- TriMet (Portland, OR): N/A - SFMTA (San Francisco, CA): N/A - VTA (San Jose, CA): N/A - DART (Dallas, TX): Reduced fares for Dallas Streetcar - LA Metro: N/A - Sound Transit (Seattle, WA): N/A - Metro Transit (Minneapolis, MN): - Tri-Rail (South Florida): N/A - Sun Tran (Tucson, AZ): N/A (currently zero-fare systemwide) - OmniTrans (San Bernardino, CA): N/A - RTA New Orleans: N/A - Trinity Metro (Fort Worth, TX): N/A - SacRT (Sacramento, CA): N/A - HART (Tampa Bay, FL): Zero-fare for Teco Line Streetcar - Metrolink (Southern California): N/A
Member Agency Practices	N/A
Other Use Cases	Foothill Transit Rose Bowl Shuttle (Pasadena, CA), Charm City Circulator (Baltimore, MD), DC Streetcar (Washington, DC)

Systemwide

Description	Zero-fare rides on all transit services in the system.

Examples	- TriMet (Portland, OR): N/A - SFMTA (San Francisco, CA): N/A - VTA (San Jose, CA): N/A - DART (Dallas, TX): N/A - LA Metro: N/A - Sound Transit (Seattle, WA): N/A - Metro Transit (Minneapolis, MN): - Tri-Rail (South Florida): N/A - Sun Tran (Tucson, AZ): Currently zero-fare systemwide - OmniTrans (San Bernardino, CA): N/A - RTA New Orleans: N/A - Trinity Metro (Fort Worth, TX): N/A - SacRT (Sacramento, CA): N/A - HART (Tampa Bay, FL): N/A - Metrolink (Southern California): N/A
Member Agency Practices	N/A
Other Use Cases	LADOT (Los Angeles, CA), DASH (Alexandria, VA), Intercity Transit (Olympia, WA), Corvallis Transit (Corvallis, OR), Park City Transit (Park City, UT), and a wide range of smaller transit agencies that have remained zero fare since the pandemic.

Other Emerging Ideas

There may be implementation options and new ideas that arise that do not fit within those outlined above. These could include other transit benefits, loyalty, rewards or fare programs.

Opportunities and Challenges

Based on the experiences of transit systems that have adopted fare equity options, each approach offers a variety of opportunities and challenges. Opportunities include improving access, ridership growth, improved transit performance, and sustainability goals. Challenges include additional costs, identifying funding to replace lost fare revenue, and day-to-day operational logistics, all of which require advanced consideration and planning.

Opportunities and challenges for zero and reduced fare programs will vary by transit system, so additional evaluation may be needed to determine the best option(s) for each transit provider.

The primary opportunities and challenges related to fare equity strategies are discussed in this section and categorized by their associated improvement goal or factor. Overall, opportunities and challenges do not represent standalone reasons for adopting or dismissing zero-fare or reduced-fare options, but instead are intended as topics transit systems should consider when determining fare options. These will vary by transit system so additional evaluation may be needed.

Community Benefits and Access to Transit

Opportunities

- **Transit Access:** Zero-fare options, which do not require direct user payment, allow transit service to be equally available to everyone, regardless of ability to pay. Reduced-fare programs also enhance transit access by lowering fares and allowing more individuals access to services, especially when oriented toward vulnerable communities In general, these options reduce the cost-related barriers that prevent all community members from being able to access transit.
- **Access to Jobs and Services:** By enhancing access, zero-fare and reduced-fare options enable more individuals to access employment opportunities, health care, social services, shopping opportunities, and other essential resources.
- **Livability:** Both zero-fare and reduced-fare options can potentially enhance community livability and economic sustainability through the elimination of barriers to transit. Specifically, a community's livability is enhanced when it offers more mobility options to its population, improving the quality of life and overall attractiveness of a community. These factors then support economic sustainability by helping the community become a more attractive place to do business, with a more mobile and accessible workforce. Furthermore, by enhancing transit access and potentially encouraging a mode shift away from personal vehicles to transit, zero-fare and reduced-fare applications could work to reduce emissions and support a community's sustainability goals.
- **Support for Local Economies:** By reducing or eliminating individuals' transportation costs, zero-fare and reduced-fare options help keep money in people's pockets. This allows more people around a community to have income available to spend on day-to-day needs as well as in local businesses and institutions; therefore, enhancing local economies with newly accessible funds.

Challenges

- **Safety and Security:** Providing increased or unlimited transit access for all individuals has the potential to cause safety and security issues related to passengers riding buses for long periods without a specific destination and causing disturbances for other riders. Therefore, when considering the adoption of zero-fare or reduced-fare options, transit systems may want to also consider operator training practices, ongoing collaboration with transit public safety agencies, and adopting policies that require customers to have a destination or limiting trip length.
- **Mode Shift:** While zero-fare and reduced-fare options tend to increase transit ridership, they are not always effective at getting people out of their automobiles. According to analyses of zero-fare applications enacted in the past, including those in Denver and Austin, only small percentages of added transit trips experienced were made by riders who switched from using their car or another motorized transportation mode. The new transit trips were made by individuals who formerly walked, rode their bike, or would not have made the trip at all. Furthermore, the Transit Cooperative

Research Program's (TCRP's) "Implementation and Outcomes of Fare Free Transit" study states that ridership increases and mode shift rates as a result of zero-fare implementation depends widely on various local factors, including transit availability and driving conditions[1]. Transit systems may want to consider accompanying their introduction of zero or reduced-fare programs with strategies to encourage mode shift, such as marketing campaigns or other targeted communications approaches, increased transit frequencies to enhance usability, and implementation of technological and/or infrastructural applications that enhance transit vehicle speeds and promote transit priority overall.

- **Eligibility Limits:** Reduced-fare programs, specifically, are sometimes based on individual eligibility. For example, transit systems may offer reduced fares only to individuals who can prove that they are under a certain income level or are over a certain age. Depending upon the requirements and the complications of the qualification process, reduced-fare programs of this type may inadvertently introduce an added barrier to accessing transit and would dissuade individuals from participating in these programs at all. Identifying eligible population groups also introduces risks of bias and stigmatizing beneficiaries. Many transit systems that have targeted reduced-fare programs determine eligibility using existing processes or methods to simplify eligibility for both the customer and transit system.
- **Transfers:** Customers that currently receive a discount when transferring between two services may not benefit if only one of those transit systems implements zero fares. Unless alternate transfer agreements are made (which could incur operating costs), these customers may see the same price for their overall trip even though one leg of their overall trip is zero cost. Since the San Diego area is served by multiple transit providers, customers transferring between a zero-fare bus and fare-charging systems would not receive the same financial benefits. This potential complication would also affect customers that receive tax-free employer commuter benefits through the Smart Benefits program, who would have less of a direct financial benefit from a zero-fare system. Customers traveling solely on the zero-fare transit system would receive the most financial benefit. For regionwide reduced fare programs, while a universal interagency pass might be optimal for interagency use and transfers, its development, implementation, and administration can pose challenges as consensus and collaboration among a range of jurisdictions would be necessary, potentially requiring policy changes and/or legislative referenda.

Ridership

Opportunities

[1] http://www.trb.org/Publications/Blurbs/167498.aspx

- **Ridership Impacts:** Under typical operating conditions characterized by a normal public health environment, the introduction of zero-fare or reduced-fare options almost always leads to increased ridership. Prior to the pandemic, transit systems that launched zero-fare programs, even if only temporarily, experienced ridership increases from 20% to as high as 85%. While transit systems tended to see the biggest increases upon program launch, which was usually accompanied by targeted marketing efforts, they were often able to sustain at least somewhat higher ridership levels over the long-term.
- **Ridership Recovery:** Offering zero- or reduced-fare options is one tool transit systems can engage to recover lost ridership after significant disruptions, such as the COVID-19 pandemic, staffing shortages, or major transit capital projects that disrupt regular service.

Challenges

- **Operational Needs Associated with Increased Ridership:** Before launching zero- or reduced-fare options, transit systems should anticipate higher ridership and prepare for the operational adjustments that may be required based on higher levels of use. For example, if ridership grows enough, routes may serve more stops along each run which affects travel times and reliability. Higher ridership may also require a larger fleet to serve demand. Transit systems that anticipate these higher usage levels and prepare for service adjustments or added costs are best equipped to accommodate the added ridership.

Transit Service Delivery

Opportunities

- **Travel Times and Reliability:** Zero-fare and reduced-fare options have the potential to reduce transit travel times and enhance on-time performance by reducing boarding times at stops. For zero-fare options, fare collection is no longer necessary, removing the need for riders to queue to pay fares while boarding buses. While reduced-fare programs do not eliminate the need for fare collection, they do reduce the need among certain rider groups, allowing some riders to board buses more quickly. Overall, with either shorter or nonexistent queues for fare payment, the boarding process can be quicker, which can reduce delays at stops, improve on-time performance, and enhance travel times. These improvements can be boosted even further with all-door boarding, often introduced along with zero-fare options, which enables riders to enter vehicles through all doors, reduces queueing at the front door, making the boarding process more efficient.
- **Operator Safety:** With elimination of the fare payment process for zero-fare options, customers will largely no longer have fare-related questions and disputes to negotiate with bus operators upon boarding; a common reason for operator/customer conflict.

This allows operators not only to stay on schedule more easily, but to also focus on delivering quality service in a more secure driving environment.

Challenges

- **Service Schedule:** Service schedules may need to be adjusted to respond to operating conditions that may result from zero- or reduced-fare options—for example, faster travel times due to reduced boarding times or slower service due to higher ridership. In some cases, transit systems that implemented zero-fare or reduced-fare options found that operators were reporting greater difficulty in adhering to schedules. If transit systems are not prepared to make schedule changes, reliability could sharply decline and deter customer use. When eliminating or reducing fares, transit systems should anticipate the potential need for schedule revisions.

Cost and Revenue

Opportunities

- **Fare Collection Costs:** For zero-fare options, some costs related to fare collection may no longer be required. These include:
    - Capital costs for fareboxes and garage equipment, as well as future replacement costs related to technology updates
    - Fare collection system operating and maintenance costs
    - Smart Card-related regional operating costs
    - Fare enforcement-related costs, especially for rail systems
    - Fare policy planning costs related to staff time devoted to analyzing and implementing fare changes
    - Public communications costs related to disseminating fare information
- **Average Subsidy per Passenger:** Also for zero-fare options, higher ridership levels can mean a decrease in overall average subsidy per passenger, even though fare revenue would no longer be collected and the total cost and subsidy related to operating transit could increase.
- **Additional Funding:** Where transit system funding allocations are based on ridership levels, the introduction of fare elimination or reduction options can actually generate additional funding, depending upon the amount of ridership the new programs add. This has occurred in Virginia, where the Virginia Department of Rail and Public Transportation (DRPT) allocates operating assistance funds based on a performance-based methodology that is partially based on ridership[2]. While California TDA funding is not currently based on ridership, this opportunity is worth understanding in general, considering potential funding policy evolution over time.

[2] http://www.drpt.virginia.gov/transit/merit/operating-and-capital-assistance/

Challenges

- **With Zero-Fare, a Lost Revenue Source:** When fares are eliminated, the revenue that transit systems generate from fares is also eliminated, although this is often a smaller part of overall revenue. Cost savings from fare collection elimination may also be offset by increased operating costs. Transit systems should compare the revenue they generate from fares with the costs spent on fare collection to determine if the full loss of a revenue source is sustainable by alternate funding sources.
- **With Reduced-Fare, a Potential Cost Increase:** Since reduced-fare options do not eliminate the need for fare collection, costs for fare collection activities remain after the introduction of these programs. Furthermore, reduced-fare options, which may involve different fare levels for different rider types based on age, income level, etc., may require added administration costs, and could result in a net cost increase for transit systems. Transit systems can leverage existing processes or methods of proving eligibility to minimize administration costs.
- **Technology Costs:** In some cases, fare elimination or reduction programs could have impacts on a transit system's technology costs. For example, some transit systems collect ridership statistics using farebox data. When considering these options, transit systems should consider the impacts that fare collection systems have on other technologies, and anticipate potential costs related to technologies, such as automatic passenger counters (APCs). Alternatively, for temporary zero-fare programs, such as a pilot project, fareboxes would likely remain in place and would have to continue to be maintained. When fareboxes are removed in zero-fare programs, alternative data collection methods should be identified.
- **Effects on Existing Community Partnerships**: Fare equity programs, especially those that call for the elimination of fares, have the potential to alter or interrupt existing revenue and fare management partnerships with community institutions, such as universities or Travel Demand Management (TDM) clients. By reducing or eliminating fares, the need for these partnerships, which traditionally promote transit use among certain groups through special fare programs, may be substantially altered or potentially negated. Therefore, transit agencies may lose partnered connections with key community groups and experience reduced ridership among members of these groups. Furthermore, regarding partners that participate in cost-sharing and help fund transit agency services, the effects of reduced or zero-fare applications may result in a loss of this funding. In advance of implementing reduced or zero-fare programs, transit agencies should coordinate with community partners and strategize about how to maintain partnerships in ways that are relevant, effective, and sustainable.
- **Long-Term Financial Sustainability:** When identifying alternate funding sources to address the revenue loss associated with eliminating or reducing fares, transit systems should consider each source's long-term sustainability and availability. Transit systems

that have reduced or eliminated fares have utilized a variety of alternative funding sources, including:

- State assistance
- Local general funds
- Regional funds
- Federal funds
- Private partnerships—hospitals, businesses, non-profits, colleges, and universities

Appendix 4: Operating & Maintenance Cost Methodology

SANDAG Fare Equity Study – Fare Equity Scenario Analysis

DRAFT Operating and Maintenance Cost Narrative Jan 18 2024

Changes to ridership from fare decreases can be expected to change the operating and maintenance (O&M) costs for transit services in San Diego County. Some of these changes are directly related to the change in ridership, such as the need to clean vehicles or stations more frequently due to increased rider interactions. In other cases, when loading standards are exceeded due to higher ridership, additional service will need to be deployed.

To align these costs with the ridership or service offering changes associated with each fare change scenario, Arcadis constructed a set of O&M cost models from information in the 2022 National Transit Database (NTD), NCTD's *FY24 Service Implementation Plan*, and the MTS's *Policy 42 Performance Monitoring Report* for FY 2022. Each of the four O&M cost categories in the glossary for the Federal Transit Administration's NTD cost reporting is treated separately:

- Vehicle Operations Cost (VOC), including:
    - Transportation administration and support;
    - Revenue vehicle movement control;
    - Scheduling of transportation operations;
    - Revenue vehicle operation, including fuel and/or traction power;
    - Ticketing and fare collection; and

- System security.

- Vehicle Maintenance Cost (VMC) including:
  - Administration;
  - Inspection and maintenance;
  - Servicing (cleaning, fueling, etc.) vehicles; and
  - Revenue vehicle repairs due to vandalism and accidents.

- Facilities Maintenance Cost (FMC), including:
  - Administration;
  - Repair of buildings, grounds and equipment as a result of accidents or vandalism;
  - Operation of electric power facilities;
  - Maintenance of: Vehicle movement control systems;
  - Fare collection and counting equipment;
  - Structures, tunnels and subways;
  - Roadway and track;
  - Passenger stations, operating station buildings, grounds and equipment;
  - Communication systems;
  - General administration buildings, grounds and equipment; and
  - Electric power facilities.

- General Administration Cost (GAC) including:
  - Transit service development;
  - Injuries and damages;
  - Safety;
  - Personnel administration;
  - Legal services;
  - Insurance;
  - Data processing;
  - Finance and accounting;
  - Purchasing and stores;
  - Engineering;
  - Real estate management;
  - Office management and services;
  - Customer services;
  - Promotion;
  - Market research; and
  - Planning.

The underlying analytical framework which Arcadis employed embodies important relationships among factors such as operating speed and energy consumption, and the characteristics of the fleet being operated. The framework was used to derive a linear model for each mode in which each of several independent variables has a unit cost coefficient.

We use several independent variables to estimate O&M costs, as opposed to the single variable most commonly used, revenue service hours (RSH), that is the hours in which vehicles are available to the general public and there is an expectation of carrying passengers. The other variables we use include:

- Revenue service miles (RSM), the miles traveled by vehicles during the RSH. RSM are sometimes used as a stand-alone estimation variable, but work well in conjunction with RSH to estimate fuel of traction power consumption based on average speed, and serve well in their own right to estimate maintenance costs dependent on mechanical wear (*e.g.* body and frame work).

- Passenger-miles traveled (PMT), the cumulative sum of the distances ridden by each passenger. Including this allows better estimation of fuel or traction power consumption, as well as wear on brakes and other mechanical systems that depend on the average weight of a vehicle. General administrative costs such as insurance, customer service, and planning are best estimated based on PMT. PMT is receiving more recognition as an effective basis for estimating overall cost-effectiveness.

- Unlinked passenger trips (UPT), which are commonly called passenger boardings. Certain costs of vehicle maintenance (*e.g.* cleaning, seat and door work) and operation (fare collection) are best attributable to boardings.

- Vehicles operated in maximum service (VOMS) are an effective basis for estimating costs which depend on the fleet size, including periodic vehicle inspections and the operation of vehicle storage and maintenance facilities.

For the transit modes with substantial fixed guideway and station infrastructure (COASTER, San Diego Trolley, and SPRINTER), unit costs which are related to the number of boardings at stations (UPT) are included for facility maintenance costs (FMC), but all other costs in the NTD FMC cost are held constant as a 'fixed infrastructure provision' because the effects of passenger loads on these cost components are very small.

General and administrative (GA) costs are estimated using unit costs based on the sum of percentages of the other three NTD cost categories: 5.07 percent of vehicle operation costs, 33.2 percent of vehicle maintenance costs, and 26.1 percent of facility maintenance costs. The coefficients of each model are then adjusted by a common factor to yield the best fit to the reported GA costs; this step is taken to adjust for differences in accounting practices among operators.

In keeping with the overall analytical framework, the O&M costs are stated in year 2022 dollars and represent a steady-state condition. No consideration was made of amortizing the capital costs for the fleet or of one-time expenditures for implementing any of the alternatives.

A final consideration is how to account for additional O&M costs when ridership increases on busy routes require laying-on additional service to not exceed loading standards. While a detailed route-by-route assessment is beyond the scope of the study, the approach is to examine the distribution of PMT by route to make hand-adjustments to aggregate level-of-service offered by mode and operator. Based on past work, the Arcadis team is confident that this will be significantly less than the percent increase in systemwide ridership. For example, in Montgomery County MD, the team estimated that the systemwide average increase in bus RVM would be about 20% of the ridership increase, based on that system's overall loading levels and available capacity. Based on the NTD data we would expect MTS to be at or slightly above this level for bus and lower for LRT. We anticipate NCTD bus will be lower than 20% because of its overall lower average bus occupancy compared to MTS, which runs many routes in higher-density corridors that are not as prevalent in North County.

MTS Buses

Table 1 shows the reported and model-estimated O&M costs for 2022 for the local buses operated by MTS (NTD 'MB' mode).

Table 1.	Revenue Service Hours (RSH)	Revenue Service Miles (RSM)	Unlinked Passenger Trips (UPT)	Passenger Miles Traveled (PMT)	Vehicles Operated in Maximum Service	Fixed Infrastructure Provision	Total
Reported NTD 2022	1,884,760	20,529,944	27,605,488	112,492,686	509	#N/A	#N/A
Model Coefficient for Vehicle Operations (VO)	$55.50	$0.604	$0.000	$0.011	$2,295	#N/A	#N/A
Model Estimate for VO	$104,604,180	$12,400,086	$0	$1,237,420	$1,168,155	#N/A	$119,409,841
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$119,400,511
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$ 0.376	$ 0.035	$ 0.211	$13,113	#N/A	#N/A
Model Estimate for VM	$0	$7,719,259	$966,192	$23,735,957	$6,674,492	#N/A	$39,095,899
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$38,718,314
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.148	$0.013	$0.000	$0	#N/A	#N/A
Model Estimate for FM	$0	$3,038,432	$358,871	$0	$0	$2,350,000	$5,747,303
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$5,756,534
Model Coefficient for General Administrative (GA)	$3.21	$0.201	$0.052	$0.071	$10,521	26.5% of FM	#N/A
Model Estimate for GA	$6,050,080	$4,126,519	$1,435,485	$7,986,981	$5,355,189	$622,750	$25,577,003
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$25,607,934
Total Model Estimate	$110,654,260	$27,284,296	$2,760,549	$32,960,357	$13,197,836	$2,972,750	$189,830,047
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$189,304,689
Attribution	RSH	RSM	UPT	PM	VOMS	Fixed Infrast	Total
Model Estd % of Total	58.3%	14.4%	1.5%	17.4%	7.0%	1.6%	

As an overall number for comparative purposes among the modes, MTS services in the 'MB' mode cost $1.68 to operate per PMT in 2022. This is calculated by taking the Total NTD Reported Cost of $189,304,689 and dividing it by the Total NTD Reported PMT of 112,492,686.

MTS Commuter Buses

Table 2 shows the reported and model-estimated O&M costs for 2022 for the MTS commuter bus (NTD 'CB' mode). It was necessary to include 'deadhead' vehicle miles and hours (movements without passengers) to make a good fit to the observed costs. Because of relatively low fleet utilization, the variable vehicles available for maximum service (VAMS) was used. The present fleet could be used to provide considerably more service.

Table 2.	Revenue and Deadhead Vehicle Hours (RDVH)	Revenue and Deadhead Vehicle Miles (RDVM)	Unlinked Passenger Trips (UPT)	Passenger Miles Traveled (PMT)	Vehicles Available for Maximum Service (VAMS)	Total
Reported NTD 2022	15,230	406,968	79,098	1,826,720	24	#N/A
Model Coefficient for Vehicle Operations (VO)	$49.18	$0.633	$0.000	$0.008	$0	#N/A
Model Estimate for VO	$749,011	$257,611	$0	$14,614	$0	$1,021,236
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	$1,095,760
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$ 0.145	$ 0.056	$ 0.015	$5,486	#N/A
Model Estimate for VM	$0	$59,010	$4,429	$27,401	$131,664	$222,505
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	$271,252
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.024	$0.000	$0.012	$0	#N/A
Model Estimate for FM	$0	$9,767	$0	$21,921	$0	$31,688
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	$22,224
Model Coefficient for General Administrative (GA)	$3.14	$0.100	$0.021	$0.048	$2,040	#N/A
Model Estimate for GA	$47,822	$40,697	$1,661	$87,683	$48,960	$226,823
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	$253,878
Total Model Estimate	$796,834	$367,085	$6,091	$151,618	$180,624	$1,502,251
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	$1,643,114
Attribution	RSH	RSM	UPT	PM	VAMS	Total
Model Estd % of Total	53.0%	24.4%	0.4%	10.1%	12.0%	

Overall, MTS services in the ‘CB’ mode cost $.90 to operate per PMT in 2022. The amount is much lower than for local bus service because of the much higher average speed of commuter buses.

MTS Light Rail

Table 3 shows the reported and model-estimated O&M costs for 2022 for MTS' San Diego Trolley (NTD 'LR' mode).

Table 3.	Revenue Service Train Hours	Revenue Service Vehicle Hours	Revenue Service Miles (RSM)	Unlinked Passenger Trips (UPT	Vehicles Operated in Maximum Service	Fixed Infrastructure Provision	Total
Reported NTD 2022	213,152	638,562	11,626,878	29,739,499	115	#N/A	#N/A
Model Coefficient for Vehicle Operations (VO)	$34.89	$9.19	$0.738	$0.569	$0	#N/A	#N/A
Model Estimate for VO	$7,436,873	$5,868,385	$8,580,636	$16,921,775	$0	#N/A	$38,807,669
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$38,807,182
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$20.02	$ 0.267	$ 0.035	$38,112	#N/A	#N/A
Model Estimate for VM	$0	$12,784,011	$3,104,376	$1,040,882	$4,382,880	#N/A	$21,312,150
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$21,316,123
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.00	$0.613	$0.008	$0	#N/A	#N/A
Model Estimate for FM	$0	$0	$7,127,276	$237,916	$0	$9,250,000	$16,615,192
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$16,621,225
Model Coefficient for General Administrative (GA)	$2.40	$10.45	$0.201	$0.182	$18,753	90% of FM	#N/A
Model Estimate for GA	$511,565	$6,672,973	$2,337,002	$5,412,589	$2,156,595	$8,325,000	$25,415,724
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$25,607,934
Total Model Estimate	$7,948,438	$25,325,369	$21,149,291	$23,613,162	$6,539,475	$17,575,000	$102,150,735
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$102,639,042
Attribution	RTSH	RVSH	RSM	UPT	VOMS	Fixed Infrast	Total
Model Estd % of Total	7.8%	24.8%	20.7%	23.1%	6.4%	17.2%	

Overall, MTS services in the 'LR' mode cost $0.49 to operate per PMT in 2022. This low rate is attributable to the good economies of scale achievable by rail systems at high passenger traffic densities.

MTS Demand Response

Table 4 shows the reported and model-estimated O&M costs for 2022 for the bus portion of MTS' Access paratransit service (NTD 'DR' mode).

Table 4.	Revenue Service Hours (RSH)	Revenue Service Miles (RSM)	Unlinked Passenger Trips (UPT)	Passenger Miles Traveled (PMT)	Vehicles Operated in Maximum Service	Total
Reported NTD 2022	113,710	2,085,026	169,124	2,164,448	51	#N/A
Model Coefficient for Vehicle Operations (VO)	$64.05	$0.347	$0.000	$0.016	$2,647	#N/A
Model Estimate for VO	$7,283,126	$723,504	$0	$34,631	$134,997	$8,176,258
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	$8,253,106
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$ 0.055	$ 0.106	$ 0.065	$20,570	#N/A
Model Estimate for VM	$0	$114,676	$17,927	$140,689	$1,049,070	$1,322,363
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	$1,432,411
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.109	$0.000	$0.032	$0	#N/A
Model Estimate for FM	$0	$227,268	$0	$69,262	$0	$296,530
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	$308,516
Model Coefficient for General Administrative (GA)	$6.10	$0.111	$0.059	$0.113	$11,657	#N/A
Model Estimate for GA	$693,631	$231,438	$9,978	$244,583	$594,507	$1,774,137
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	$1,836,559
Total Model Estimate	$7,976,757	$1,296,886	$27,905	$489,165	$1,778,574	$11,569,287
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	$11,830,592
Attribution	RSH	RSM	UPT	PM	VOMS	Total
Model Estd % of Total	68.9%	11.2%	0.2%	4.2%	15.4%	

Overall, MTS bus services in the 'DR' mode cost $5.47 to operate per PMT in 2022. The taxi-based services, a relatively small fraction of total DR operations, averaged $2.58 per PMT. It is proposed to use this as the unit cost for the taxi-based portion.

NCTD Bus

Table 5 shows the reported and model-estimated O&M costs for 2022 for the bus (NTD 'MB' mode), operating as BREEZE.

Table 5.	Revenue Service Hours (RSH)	Revenue Service Miles (RSM)	Unlinked Passenger Trips (UPT)	Passenger Miles Traveled (PMT)	Vehicles Operated in Maximum Service	Fixed Infrastructure Provision	Total
Reported NTD 2022	421,654	5,253,714	3,944,001	16,998,976	135	#N/A	#N/A
Model Coefficient for Vehicle Operations (VO)	$57.95	$0.511	$0.000	$0.011	$2,298	#N/A	#N/A
Model Estimate for VO	$24,434,849	$2,684,648	$0	$186,989	$310,230	#N/A	$27,616,716
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$28,133,464
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$ 0.310	$ 0.050	$ 0.195	$25,328	#N/A	#N/A
Model Estimate for VM	$0	$1,628,651	$197,200	$3,314,800	$3,419,321	#N/A	$8,559,972
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$8,504,713
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.266	$0.022	$0.000	$0	#N/A	#N/A
Model Estimate for FM	$0	$1,397,488	$86,768	$0	$0	$2,500,000	$3,984,256
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$3,370,152
Model Coefficient for General Administrative (GA)	$7.27	$0.433	$0.142	$0.130	$22,053	54.7% of FM	#N/A
Model Estimate for GA	$3,065,425	$2,274,858	$560,048	$2,209,867	$2,977,155	$1,367,500	$12,454,853
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$12,962,598
Total Model Estimate	$27,500,274	$7,985,645	$844,016	$5,711,656	$6,706,706	$3,867,500	$52,615,797
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$52,970,927
Attribution	RSH	RSM	UPT	PM	VOMS	Fixed Infrast	Total
Model Estd % of Total	52.3%	15.2%	1.6%	10.9%	12.7%	7.4%	

Overall, NCTD services in the 'MB' mode cost $3.42 to operate per PMT in 2022. The difference from MTS local bus services is attributable to the average bus occupancy on NCTD being lower than on MTS.

NCTD Commuter Rail

Table 6 shows the reported and model-estimated O&M costs for 2022 for NCTD's COASTER commuter rail service (NTD 'CR' mode). Because of significant recent changes (including transitioning some functions from a contractor to NCTD, the creation of new departments at NCTD), and substantial changes in the service offering, it was not possible to get as reliable an attribution of costs to categories using the model variables alone as for the other modes. We introduced a new variable which generally characterizes the extent of the rail operation (millions of gross ton miles operated (MGTM), a measure commonly used in the rail industry) to allocate amounts necessary to converge with the results reported to NTD for 2022. It is reasonable to presume that the costs directly associated with accommodating the passenger traffic (*e.g.* fuel consumption and

mechanical wear) will be rather small, and that any changes to the service plan which might be necessary to accommodate a change in passenger traffic would account for most of any estimated change.

Table 6.	Revenue Service Locomotive Hours (RSL	Revenue Service Coach Miles (RSCM)	Unlinked Passeger Trips (UPT	Millions of Gross Ton Miles Operated (MGTM)	Fixed Station and Way	Total
Reported NTD 2022	11,566	1,244,384	588,409	131.38	#N/A	#N/A
Model Coefficient for Vehicle Operations (VO)	$457.72	$2.199	$0.801	$23,650	$32,839 per station	#N/A
Model Estimate for VO	$5,293,990	$2,736,399	$471,316	$3,107,137	$262,712	$11,871,554
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	$11,871,499
Model Coefficient for Vehicle Maintenance (VM)	$16.47	$ 0.116	$0	$48,455	#N/A	#N/A
Model Estimate for VM	$190,492	$144,348	$0	$6,366,018	#N/A	$6,700,858
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	$6,700,823
Model Coefficient for Facilities Maintenance (FM)	$92.64	$1.365	$0.000	$0.000	$23,782 per track mile	#N/A
Model Estimate for FM	$1,071,474	$1,698,584	$0	$0	$3,124,494	$5,894,552
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	$5,799,144
Model Coefficient for General Administrative (GA)	$110.34	$1.178	$0.377	$35,785	$1,777 per track mile + $2,675 per station	#N/A
Model Estimate for GA	$1,276,192	$1,465,884	$221,985	$4,701,433	$1,798,846	$9,464,340
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	$9,464,356
Total Model Estimate	$7,832,148	$6,045,215	$693,300	$14,174,588	$4,923,340	$33,931,304
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	$33,835,822
Attribution	RSLH	RSCM	UPT	MGTM	FS&W	Total
Model Estd % of Total	23.1%	17.8%	2.0%	41.8%	14.5%	

Overall, NCTD services in the ‘CR’ mode cost $2.17 to operate per PMT in 2022.

NCTD Hybrid Rail

Table 7 shows the reported and model-estimated O&M costs for 2022 for the NCTD's SPRINTER light rail service. Technically this is reported under NTD's 'YR' (hybrid) mode because it is not electrified.

Table 7.	Revenue Service Train Hours	Revenue Service Vehicle Hours	Revenue Service Miles (RSM)	Unlinked Passenger Trips (UPT	Vehicles Operated in Maximum Service	Fixed Infrastructure Provision	Total
Reported NTD 2022	23,375	35,027	770,651	1,322,380	18	#N/A	#N/A
Model Coefficient for Vehicle Operations (VO)	$29.05	$97.32	$4.421	$1.208	$0	#N/A	#N/A
Model Estimate for VO	$679,044	$3,408,828	$3,407,048	$1,597,435	$0	#N/A	$9,092,355
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$9,092,052
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$35.51	$ 0.058	$ 0.234	$101,845	#N/A	#N/A
Model Estimate for VM	$0	$1,243,809	$44,698	$309,437	$1,833,210	#N/A	$3,431,153
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$3,419,057
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.00	$3.830	$0.037	$0	#N/A	#N/A
Model Estimate for FM	$0	$0	$2,951,593	$48,928	$0	$5,400,000	$8,400,521
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$8,443,080
Model Coefficient for General Administrative (GA)	$1.87	$23.37	$2.370	$0.143	$48,682	70% of FM	#N/A
Model Estimate for GA	$43,711	$818,581	$1,826,443	$189,100	$876,276	$3,780,000	$7,534,111
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$7,630,214
Total Model Estimate	$722,755	$5,471,217	$8,229,782	$2,144,900	$2,709,486	$9,180,000	$28,458,141
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$28,584,403
Attribution	RTSH	RVSH	RSM	UPT	VOMS	Fixed Infrast	Total
Model Estd % of Total	2.5%	19.2%	28.9%	7.5%	9.5%	32.3%	

Overall, NCTD services in the 'YR' mode cost $2.90 to operate per PMT in 2022. This is higher than for the San Diego Trolley because its passenger traffic density is lower.

NCTD Demand Response

Table 8 shows the reported and model-estimated O&M costs for 2022 for the demand-response ADA paratransit (NTD 'DR' mode), operating as LIFT.

Table 8.	Revenue Service Hours (RSH)	Revenue Service Miles (RSM)	Unlinked Passenger Trips (UPT)	Passenger Miles Traveled (PMT)	Vehicles Operated in Maximum Service	Fixed Infrastructure Provision	Total
Reported NTD 2022	39,661	734,694	72,376	1,162,888	16	#N/A	#N/A
Model Coefficient for Vehicle Operations (VO)	$87.24	$0.341	$0.000	$0.016	$3,554	#N/A	#N/A
Model Estimate for VO	$3,460,026	$250,531	$0	$18,606	$56,864	#N/A	$3,786,027
NTD Reported for VO	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$3,818,881
Model Coefficient for Vehicle Maintenance (VM)	$0.00	$ 0.217	$ 0.382	$ 0.152	$73,395	#N/A	#N/A
Model Estimate for VM	$0	$159,429	$27,648	$176,759	$1,174,320	#N/A	$1,538,155
NTD Reported for VM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$1,755,118
Model Coefficient for Facilities Maintenance (FM)	$0.00	$0.043	$0.000	$0.116	$0	#N/A	#N/A
Model Estimate for FM	$0	$31,592	$0	$134,895	$0	$310,000	$476,487
NTD Reported for FM	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$477,744
Model Coefficient for General Administrative (GA)	$15.76	$0.650	$0.402	$0.402	$77,855	82.7% of FM	#N/A
Model Estimate for GA	$625,057	$477,551	$29,095	$467,481	$1,245,680	$256,370	$3,101,235
NTD Reported for GA	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$3,046,098
Total Model Estimate	$4,085,083	$919,102	$56,743	$797,741	$2,476,864	$566,370	$8,901,903
NTD Reported Total	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	$9,097,841
Attribution	RSH	RSM	UPT	PM	VOMS	Fixed Infrast	Total
Model Estd % of Total	45.9%	10.3%	0.6%	9.0%	27.8%	6.4%	

Overall, NCTD services in the 'DR' mode cost $7.82 to operate per PMT in 2022.

Appendix 5: Fare Scenario Ridership Sketch Model Methodology

SANDAG Fare Equity Study – Fare Equity Scenario Analysis

DRAFT Fare Scenario Ridership Sketch Model Documentation March 4 2024

This memo describes the sketch-planning method to estimate changes to ridership due to the fare reduction scenarios under study.
Arcadis' approach is based on prior work for Central Ohio Transit Authority (COTA) and Montgomery County (MD) Department of Transportation (Ride On). Central to this approach are three elements:

1) A *logit* estimation technique rather than using a simple point elasticity (percent change in ridership per percent change in fare) to estimate ridership changes in response to fare changes. Logit mode-choice formulations are commonly used in regional travel demand forecasting models, including SANDAG's regional ABM2+ model.

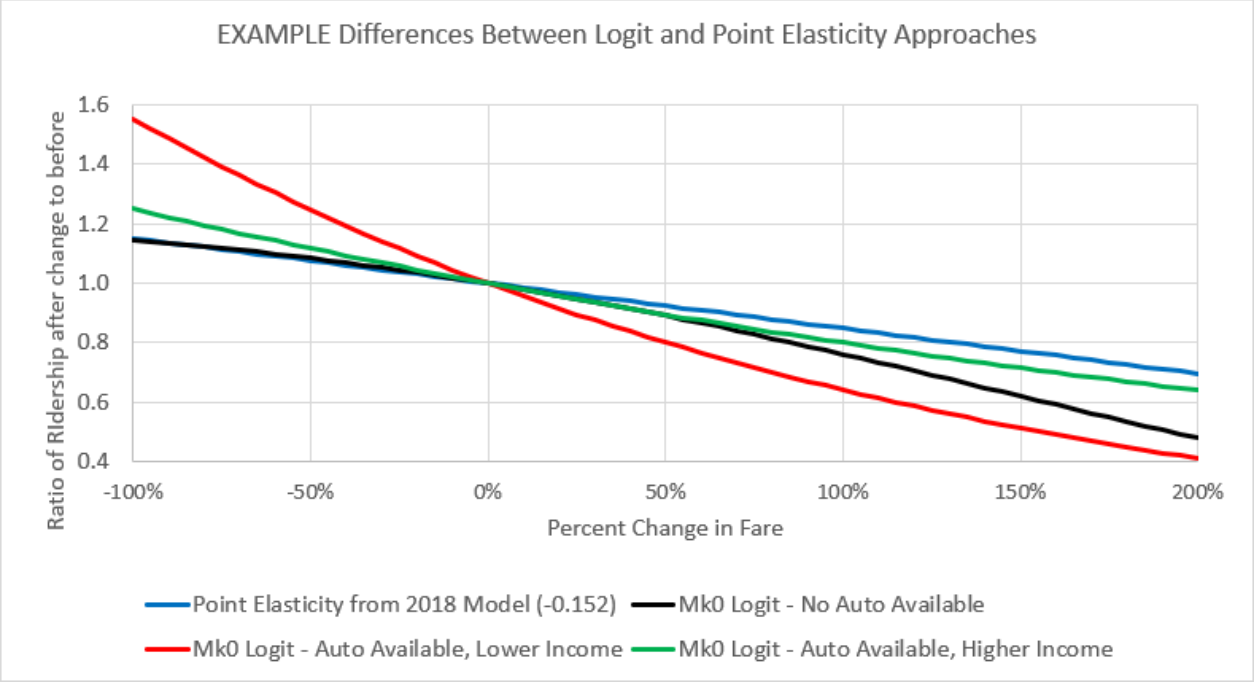
The logit formulation allows segmentation of the market into distinct groups that respond differently to changes in fare. For example, a logit basis can allow a higher value of time to be applied for higher-income travelers, and the non-availability of autos for some travelers can be represented using a bias coefficient, which is inferred from the rider survey data. By allowing factors other than fare influence the attractiveness of transit versus other

modes, the logit approach avoids some awkwardness with respect to using point elasticities for discounted fares.

Through a comparison of regional models across the US, Arcadis has identified a set of typical 'starter' coefficients for logit modeling in terms of: in-vehicle time, out-of-vehicle time, inconvenience (out-of-vehicle time per mile), and mode bias (other intrinsic differences in the attractiveness of alternative modes, *e.g.* privacy and need to consider schedules).

2) A *disaggregation* of the transit travel market based on income and auto availability. In conjunction with the logit approach, this allows each market to have a response that can be compared in terms of point elasticities; for instance for COTA Arcadis estimated that the combined point elasticity for travelers with access to an auto was higher than that for those without such access; the weighted combined value of -0.142 was not far from the value derived for SANDAG's 2018 fare model (-0.152).

An example application of the logit formulation for a hypothetical five-mile trip is shown in the graph below. The blue line is a forecast based on the aggregate point elasticity derived for SANDAG's 2018 fare model. The black, red and green lines are the forecasts from a simple three-part logit-based disaggregation with the 'starter' parameters (hence the "Mk0" designation). According to the preliminary results of the SANDAG 2023 passenger survey, about 37% of the surveyed transit travelers report having access to an automobile, so the similarity of the 'no auto access' logit curve to the line based on point elasticity suggests reasonable comparability at a high level. The logit formulation lends itself better to representing the 'capture' of trips from driving alone among those travelers who do have auto access.



3) Use of available information. Information on ridership and revenues by fare category and the granularity of preliminary data from the 2023 passenger survey informed the choice of a market segmentation. Both the survey data and the results of SANDAG's baseline regional model runs were used to adjust/refine the 'starter' logit parameters and to form a rough estimate of total modal competition for the transit passenger market.

Examination of the existing data which were provided guided the formation of the model structure. It was observed that:

- The 2018 fare model developed by SANDAG provided a very high level of detail on fare products (cash fares and a large array of possibilities offered with PRONTO) and their associated ridership and revenue. However, it has not been updated from 2018 with regards to fare categories and levels, and it was based on a pre-pandemic rider survey. An attempt to update this would have required a level of time and effort that is beyond the resources established for the study.

- As of the time interim data were made available, the 2023 rider survey was still in a preliminary state and was undergoing validation tests. The survey data made available were not in a form amenable to characterizing the forms of fare payment at the level of detail

needed to update the 2018 fare model, even if there had been no change in the fare structure.

- The interim 2023 survey results did not show a strong relationship of choice of type of fare payment with the household income of the traveler, as shown in Table 1. Given the relatively limited aspects of cash fare choices (especially the lack of ability to transfer), PRONTO fare products dominate.

The interim 2023 survey results indicated a relationship between a traveler's household income and auto availability for their trip which is like what Arcadis has observed elsewhere in North America. A smoothed logit function was derived from the 2023 survey results: to establish the estimated fraction with auo access:

$$1.0 / [1.0 + \exp (6.129 - 0.0000035 X - 0.5071 \ln X - 0.000026 Y)]$$

where X is the median traveler household income of each bracket, and Y is the amount (if any) that X is less than $29,740.

Table 1.	Cash - One-Way (no transfer)	Other non-PRONTO	PRONTO One-way (free transfer)	PRONTO Passes (Monthly or longer)	PRONTO Free Passes	PRONTO Other
$14,999 or less	15.9%	1.0%	30.1%	46.9%	4.3%	1.8%
$15,000 - $19,999	13.9%	0.6%	27.2%	55.1%	2.0%	1.3%
$20,000 - $24,999	15.6%	0.8%	26.8%	51.4%	4.1%	1.3%
$25,000 - $29,999	14.0%	0.6%	31.6%	45.9%	6.7%	1.3%
$30,000 - $34,999	15.1%	0.3%	33.1%	45.0%	5.1%	1.4%
$35,000 - $39,999	14.4%	0.4%	32.8%	48.3%	3.1%	1.0%
$40,000 - $44,999	13.5%	0.4%	34.3%	46.8%	4.2%	0.9%
$45,000 - $49,999	13.7%	0.5%	35.8%	45.6%	3.6%	0.8%
$50,000 - $59,999	12.7%	0.2%	31.8%	47.4%	6.9%	1.0%
$60,000 - $74,999	12.5%	0.3%	29.6%	50.5%	6.1%	1.1%
$75,000 - $99,999	12.3%	0.4%	29.7%	51.1%	5.9%	0.6%
$100,000 - $149,999	12.0%	1.1%	32.4%	50.4%	3.4%	0.6%
$150,000 or above	13.9%	1.0%	36.7%	45.1%	2.7%	0.8%
Total	**14.0%**	**0.6%**	**31.4%**	**48.2%**	**4.7%**	**1.2%**

In light of the observations above, the market segmentation for the ridership estimates was established as the set of household income brackets used in the 2023 ridership survey, as shown in Table 1. This also makes the effects of means-tested scenarios more apparent when viewed from an equity perspective.

For each scenario, the model structure offers the basis for presenting ridership and revenue results in the format shown in Table 2. The relatively modest differences in fare product mix for each income bracket are reflected in a slightly different average revenue per boarding for each bracket. No provision is made for differentiating results by trip length; the survey provides no information on this. For each mode/operator combination identified in Table 2, the average unlinked passenger trip length was established from 2022 operating statistics reported to the NTD.

Table 2. Early Results Summary Example

Scenario 9 - Systemwide Zero Fare Program									
Operator/mode	**Scenario 1 (Baseline) Boardings**	**Scenario 9 Boardings**	**Percent Change**	**Scenario 1 (Baseline) Fare Revenues**	**Scenario 9 Fare Revenues**	**Percent Change**	**Scenario 1 (Baseline) O&M Costs**	**Scenario 9 O&M Costs**	**Percent Change**
MTS local bus	27,605,488	33,834,251	22.6%	$29,498,006	$0	-100.0%	$189,820,647	$215,274,256	13.4%
MTS commuter bus	79,098	102,790	30.0%	$212,806	$0	-100.0%	$3,459,783	$3,638,164	5.2%
MTS light rail (Trolley)	29,739,499	35,115,982	18.1%	$25,518,764	$0	-100.0%	$102,150,735	$106,424,718	4.2%
MTS Access	169,124	203,373	20.3%	$847,306	$0	-100.0%	$11,569,287	$13,917,853	20.3%
Subtotal MTS	**57,593,209**	**69,256,396**	**20.3%**	**$56,076,882**	**$0**	**-100.0%**	**$307,000,452**	**$339,254,991**	10.5%
NCTD BREEZE bus	3,944,001	4,642,897	17.7%	$4,414,637	$0	-100.0%	$52,615,797	$55,337,278	5.2%
NCTD COASTER	588,409	616,819	4.8%	$2,449,068	$2,118,578	-13.5%	$33,931,304	$33,971,549	0.1%
NCTD SPRINTER	1,322,380	1,459,482	10.4%	$1,166,835	$0	-100.0%	$28,458,141	$28,681,210	0.8%
NCTD LIFT	72,376	83,062	14.8%	$866,617	$0	-100.0%	$8,901,903	$10,135,562	13.9%
Subtotal NCTD	**5,927,166**	**6,802,259**	**14.8%**	**$8,897,157**	**$2,118,578**	**-76.2%**	**$123,907,145**	**$128,125,599**	3.4%
TOTAL	***63,520,375***	***76,058,656***	***19.7%***	***$64,974,039***	***$2,118,578***	***-96.7%***	***$430,907,597***	***$467,380,590***	8.5%

For each household income bracket, the travel market was split into travelers with and without access to an auto, and separate values for mode bias constants were applied for both. This segmentation scheme makes efficient use of the available survey data and allows for the benefits of the logit formulation in terms of both income and auto availability to be realized. Key logit model parameters common to all modes are presented in Table 3. Perceived costs were established by adjusting by a factor for each income bracket, relative to the median traveler bracket ($35,000-$39,999) which was set to 1.00. The values of the adjustment ranged from 3.10 for the lowest bracket (under $14,999) to 0.24 for the highest bracket (over $150,000).

TABLE 3. Logit Parameter	**Units**	**Travelers with auto access**	**Travelers without auto access**
In-vehicle time	minutes	-0.038	-0.038
Out-of-vehicle time (OVT)	minutes	-0.057	-0.057
Perceived trip cost	dollars	-0.157	-0.157
OVT per mile traveled	min/mile	-0.300	-0.300
Mode bias for auto or TNC	#N/A	1.50	-1.30
Mode bias for transit	#N/A	-1.75	-1.30
Mode bias for shared ride	#N/A	#N/A	1.30
Mode bias for walk/bike	#N/A	-6.00	-2.20

It should be noted that the survey data were not sufficient to extend the logit approach to the two demand response modes, MTS access and NCTD LIFT. A literature search did not turn up a basis for forming a coherent set

of parameters from elsewhere. Significant operational changes in these programs over the pandemic period could not be resolved within the resources available. In consultation with the project management, ridership estimates for Access and LIFT were therefore assumed to grow in proportion to the estimated sums of the local fixed route modes for each operator (bus and San Diego Trolley for MTS, and BREEZE and SPRINTER for NCTD).

Appendix 6: Post Peer-Review Detailed Ridership Analysis Results

SANDAG Fare Equity Study – Fare Equity Scenario Analysis

1. Ridership Analysis by Scenario and Mode

	Scenario 1 (Baseline)	Scenario 2 (Extended YOP)		Scenario 3 (Transitional YOP)		Scenario 4 (Income Based Free < 100% FPL)		Scenario 5 (User Type Reduced)		Scenario 6 (User Type Zero Fare)		Scenario 7 (Higher Education)		Scenario 8 (Systemwide Reduced)		Scenario 9 (Systemwide Zero Fare)	
Operator/Mode	Boardings	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1
MTS local bus	27,605,488	28,173,490	2.06%	27,840,048	0.85%	30,922,215	12.01%	27,810,600	0.74%	28,103,631	1.80%	27,845,373	0.87%	30,527,788	10.59%	33,834,251	22.56%
MTS commuter bus	79,098	81,387	2.89%	80,066	1.22%	84,510	6.84%	79,931	1.05%	81,068	2.49%	80,618	1.92%	89,884	13.64%	102,790	29.95%
MTS light rail (Trolley)	29,739,499	30,233,747	1.66%	29,946,177	0.69%	32,593,163	9.60%	29,919,952	0.61%	30,171,757	1.45%	29,952,071	0.71%	32,306,987	8.63%	35,115,982	18.08%
MTS Access	169,124	172,222	1.83%	169,656	0.31%	187,322	10.76%	170,261	0.67%	171,259	1.26%	170,458	0.79%	185,324	9.58%	203,373	20.25%
Subtotal MTS	*57,593,209*	*58,660,846*	*1.85%*	*58,035,946*	*0.77%*	*63,787,210*	*10.75%*	*57,980,745*	*0.67%*	*58,527,716*	*1.62%*	*58,048,520*	*0.79%*	*63,109,983*	*9.58%*	*69,256,396*	*20.25%*
NCTD BREEZE bus	3,944,001	4,006,499	1.58%	3,970,755	0.68%	4,378,532	11.02%	3,968,990	0.63%	4,002,437	1.48%	3,966,834	0.58%	4,290,274	8.78%	4,642,897	17.72%
NCTD COASTER	588,409	588,409	0.00%	588,409	0.00%	611,017	3.84%	595,672	1.23%	595,253	1.16%	593,327	0.84%	588,409	0.00%	588,409	0.00%
NCTD SPRINTER	1,322,380	1,335,156	0.97%	1,327,982	0.42%	1,392,955	5.34%	1,327,520	0.39%	1,334,123	0.89%	1,328,241	0.44%	1,390,853	5.18%	1,459,482	10.37%
NCTD LIFT	72,376	73,411	1.43%	72,563	0.26%	78,900	9.01%	72,790	0.57%	73,340	1.33%	72,770	0.54%	77,503	7.08%	83,062	14.76%
Subtotal NCTD	*5,927,166*	*6,003,475*	*1.29%*	*5,959,709*	*0.55%*	*6,461,404*	*9.01%*	*5,964,971*	*0.64%*	*6,005,154*	*1.32%*	*5,961,172*	*0.57%*	*6,347,039*	*7.08%*	*6,773,849*	*14.28%*
TOTAL	**63,520,375**	**64,664,321**	**1.80%**	**63,995,655**	**0.75%**	**70,248,614**	**10.59%**	**63,945,716**	**0.67%**	**64,532,870**	**1.59%**	**64,009,692**	**0.77%**	**69,457,022**	**9.35%**	***76,030,246***	**19.69%**

2. Equity Analysis by Scenario

	Scenario 1 (Baseline)	Scenario 2 (Extended YOP)		Scenario 3 (Transitional YOP)		Scenario 4 (Income Based Free < 100% FPL)		Scenario 5 (User Type Reduced)		Scenario 6 (User Type Zero Fare)		Scenario 7 (Higher Education)		Scenario 8 (Systemwide Reduced)		Scenario 9 (Systemwide Zero Fare)	
Household Income Bracket	Boardings	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1
$14,999 or less	11,804,744	12,261,642	3.87%	11,977,333	1.46%	16,412,798	39.04%	11,964,094	1.35%	12,218,691	3.51%	11,865,221	0.51%	14,345,101	21.52%	17,302,523	46.57%
$15,000 - $19,999	5,535,709	5,673,051	2.48%	5,589,991	0.98%	6,487,452	17.19%	5,579,846	0.80%	5,645,815	1.99%	5,609,458	1.33%	6,212,907	12.23%	6,955,158	25.64%
$20,000 - $24,999	5,637,271	5,748,008	1.96%	5,684,214	0.83%	6,214,335	10.24%	5,678,305	0.73%	5,732,582	1.69%	5,672,575	0.63%	6,188,069	9.77%	6,781,949	20.31%
$25,000 - $29,999	5,573,579	5,650,488	1.38%	5,607,064	0.60%	5,881,994	5.53%	5,608,081	0.62%	5,651,504	1.40%	5,605,915	0.58%	6,027,052	8.14%	6,510,576	16.81%
$30,000 - $34,999	5,475,011	5,547,414	1.32%	5,507,341	0.59%	5,634,134	2.91%	5,508,158	0.61%	5,547,927	1.33%	5,518,270	0.79%	5,879,880	7.39%	6,309,449	15.24%
$35,000 - $39,999	4,735,131	4,800,062	1.37%	4,764,544	0.62%	4,800,060	1.37%	4,761,888	0.57%	4,792,927	1.22%	4,775,432	0.85%	5,049,984	6.65%	5,382,254	13.67%
$40,000 - $44,999	4,143,919	4,198,961	1.33%	4,168,930	0.60%	4,168,335	0.59%	4,164,680	0.50%	4,188,439	1.07%	4,190,572	1.13%	4,386,773	5.86%	4,641,576	12.01%
$45,000 - $49,999	3,336,207	3,380,697	1.33%	3,356,406	0.61%	3,343,912	0.23%	3,350,724	0.44%	3,367,127	0.93%	3,368,269	0.96%	3,506,565	5.11%	3,684,283	10.43%
$50,000 - $59,999	4,609,373	4,659,116	1.08%	4,631,717	0.48%	4,611,440	0.04%	4,627,246	0.39%	4,647,186	0.82%	4,657,726	1.05%	4,819,199	4.55%	5,037,176	9.28%
$60,000 - $74,999	4,373,024	4,419,967	1.07%	4,393,693	0.47%	4,373,025	0.00%	4,386,845	0.32%	4,401,939	0.66%	4,419,403	1.06%	4,534,778	3.70%	4,701,734	7.52%
$75,000 - $99,999	3,933,134	3,965,169	0.81%	3,946,786	0.35%	3,933,135	0.00%	3,943,070	0.25%	3,953,394	0.52%	3,956,143	0.58%	4,046,434	2.88%	4,162,654	5.84%
$100,000 - $149,999	2,582,719	2,590,173	0.29%	2,585,645	0.11%	2,582,720	0.00%	2,588,003	0.20%	2,592,772	0.39%	2,585,812	0.12%	2,634,642	2.01%	2,687,556	4.06%
$150,000 or above	1,539,052	1,541,054	0.13%	1,539,771	0.05%	1,539,053	0.00%	1,541,726	0.17%	1,543,929	0.32%	1,541,666	0.17%	1,562,810	1.54%	1,586,931	3.11%
TOTAL not including ACCESS and LIFT	**63,278,875**	**64,435,802**	**1.83%**	**63,753,436**	**0.75%**	**69,982,392**	**10.59%**	**63,702,665**	**0.67%**	**64,284,232**	**1.59%**	**63,766,464**	**0.77%**	**69,194,195**	**9.35%**	**75,743,818**	**19.70%**
SUBTOTAL trips with HHI <$35K	**34,026,314**	**34,880,603**	**2.51%**	**34,365,944**	**1.00%**	**40,630,713**	**19.41%**	**34,338,483**	**0.92%**	**34,796,519**	**2.26%**	**34,271,439**	**0.72%**	**38,653,009**	**13.60%**	**43,859,654**	**28.90%**
New 'equity' trips (<$35K)		**854,289**		**339,630**		**6,604,399**		**312,169**		**770,204**		**245,125**		**4,626,695**		**9,833,340**	

3. Fiscal Analysis by Scenario

	Scenario 1 (Baseline)	Scenario 2 (Extended YOP)		Scenario 3 (Transitional YOP)		Scenario 4 (Income Based Free < 100% FPL)		Scenario 5 (User Type Reduced)		Scenario 6 (User Type Zero Fare)		Scenario 7 (Higher Education)		Scenario 8 (Systemwide Reduced)		Scenario 9 (Systemwide Zero Fare)	
Fiscal Factors			Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1
Fare Revenues	$64,974,039	$57,856,601	-10.95%	$62,105,337	-4.42%	$46,125,978	-29.01%	$62,397,347	-3.97%	$58,711,938	-9.64%	$60,341,743	-7.13%	$36,686,318	-43.54%	$2,449,068	-96.23%
Operating & Maintenance Costs	$430,907,597	$433,851,156	0.68%	$432,019,552	0.26%	$449,383,044	4.29%	$431,969,281	0.25%	$433,423,895	0.58%	$432,172,637	0.29%	$446,656,374	3.65%	$467,340,345	8.45%
Administrative costs for means-tested program	$0	$0	#N/A	$0	#N/A	$2,900,000	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A
Savings from discontinued fare collection	$0	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$12,900,000	#N/A
Change in Net Operating Support (NOS)		$10,060,996	2.75%	$3,980,657	1.09%	$40,223,508	10.99%	$3,638,376	0.99%	$8,778,399	2.40%	$5,897,336	1.61%	$44,036,497	12.03%	$86,057,719	23.52%

Appendix 6: Post Peer-Review Detailed Ridership Analysis Results

SANDAG Fare Equity Study – Fare Equity Scenario Analysis

1. Ridership Analysis by Scenario and Mode

	Scenario 1 (Baseline)	Scenario 2 (Extended YOP)		Scenario 3 (Transitional YOP)		Scenario 4 (Income Based Free < 100% FPL)		Scenario 5 (User Type Reduced)		Scenario 6 (User Type Zero Fare)		Scenario 7 (Higher Education)		Scenario 8 (Systemwide Reduced)		Scenario 9 (Systemwide Zero Fare)	
Operator/Mode	Boardings	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1
MTS local bus	27,605,488	28,173,490	2.06%	27,840,048	0.85%	30,922,215	12.01%	27,810,600	0.74%	28,103,631	1.80%	27,845,373	0.87%	30,527,788	10.59%	33,834,251	22.56%
MTS commuter bus	79,098	81,387	2.89%	80,066	1.22%	84,510	6.84%	79,931	1.05%	81,068	2.49%	80,618	1.92%	89,884	13.64%	102,790	29.95%
MTS light rail (Trolley)	29,739,499	30,233,747	1.66%	29,946,177	0.69%	32,593,163	9.60%	29,919,952	0.61%	30,171,757	1.45%	29,952,071	0.71%	32,306,987	8.63%	35,115,982	18.08%
MTS Access	169,124	172,222	1.83%	169,656	0.31%	187,322	10.76%	170,261	0.67%	171,259	1.26%	170,458	0.79%	185,324	9.58%	203,373	20.25%
Subtotal MTS	*57,593,209*	*58,660,846*	*1.85%*	*58,035,946*	*0.77%*	*63,787,210*	*10.75%*	*57,980,745*	*0.67%*	*58,527,716*	*1.62%*	*58,048,520*	*0.79%*	*63,109,983*	*9.58%*	*69,256,396*	*20.25%*
NCTD BREEZE bus	3,944,001	4,006,499	1.58%	3,970,755	0.68%	4,378,532	11.02%	3,968,990	0.63%	4,002,437	1.48%	3,966,834	0.58%	4,290,274	8.78%	4,642,897	17.72%
NCTD COASTER	588,409	588,409	0.00%	588,409	0.00%	611,017	3.84%	595,672	1.23%	595,253	1.16%	593,327	0.84%	588,409	0.00%	588,409	0.00%
NCTD SPRINTER	1,322,380	1,335,156	0.97%	1,327,982	0.42%	1,392,955	5.34%	1,327,520	0.39%	1,334,123	0.89%	1,328,241	0.44%	1,390,853	5.18%	1,459,482	10.37%
NCTD LIFT	72,376	73,411	1.43%	72,563	0.26%	78,900	9.01%	72,790	0.57%	73,340	1.33%	72,770	0.54%	77,503	7.08%	83,062	14.76%
Subtotal NCTD	*5,927,166*	*6,003,475*	*1.29%*	*5,959,709*	*0.55%*	*6,461,404*	*9.01%*	*5,964,971*	*0.64%*	*6,005,154*	*1.32%*	*5,961,172*	*0.57%*	*6,347,039*	*7.08%*	*6,773,849*	*14.28%*
TOTAL	**63,520,375**	**64,664,321**	**1.80%**	**63,995,655**	**0.75%**	**70,248,614**	**10.59%**	**63,945,716**	**0.67%**	**64,532,870**	**1.59%**	**64,009,692**	**0.77%**	**69,457,022**	**9.35%**	***76,030,246***	**19.69%**

2. Equity Analysis by Scenario

	Scenario 1 (Baseline)	Scenario 2 (Extended YOP)		Scenario 3 (Transitional YOP)		Scenario 4 (Income Based Free < 100% FPL)		Scenario 5 (User Type Reduced)		Scenario 6 (User Type Zero Fare)		Scenario 7 (Higher Education)		Scenario 8 (Systemwide Reduced)		Scenario 9 (Systemwide Zero Fare)	
Household Income Bracket	Boardings	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1	Boardings	Change from Scenario 1
$14,999 or less	11,804,744	12,261,642	3.87%	11,977,333	1.46%	16,412,798	39.04%	11,964,094	1.35%	12,218,691	3.51%	11,865,221	0.51%	14,345,101	21.52%	17,302,523	46.57%
$15,000 - $19,999	5,535,709	5,673,051	2.48%	5,589,991	0.98%	6,487,452	17.19%	5,579,846	0.80%	5,645,815	1.99%	5,609,458	1.33%	6,212,907	12.23%	6,955,158	25.64%
$20,000 - $24,999	5,637,271	5,748,008	1.96%	5,684,214	0.83%	6,214,335	10.24%	5,678,305	0.73%	5,732,582	1.69%	5,672,575	0.63%	6,188,069	9.77%	6,781,949	20.31%
$25,000 - $29,999	5,573,579	5,650,488	1.38%	5,607,064	0.60%	5,881,994	5.53%	5,608,081	0.62%	5,651,504	1.40%	5,605,915	0.58%	6,027,052	8.14%	6,510,576	16.81%
$30,000 - $34,999	5,475,011	5,547,414	1.32%	5,507,341	0.59%	5,634,134	2.91%	5,508,158	0.61%	5,547,927	1.33%	5,518,270	0.79%	5,879,880	7.39%	6,309,449	15.24%
$35,000 - $39,999	4,735,131	4,800,062	1.37%	4,764,544	0.62%	4,800,060	1.37%	4,761,888	0.57%	4,792,927	1.22%	4,775,432	0.85%	5,049,984	6.65%	5,382,254	13.67%
$40,000 - $44,999	4,143,919	4,198,961	1.33%	4,168,930	0.60%	4,168,335	0.59%	4,164,680	0.50%	4,188,439	1.07%	4,190,572	1.13%	4,386,773	5.86%	4,641,576	12.01%
$45,000 - $49,999	3,336,207	3,380,697	1.33%	3,356,406	0.61%	3,343,912	0.23%	3,350,724	0.44%	3,367,127	0.93%	3,368,269	0.96%	3,506,565	5.11%	3,684,283	10.43%
$50,000 - $59,999	4,609,373	4,659,116	1.08%	4,631,717	0.48%	4,611,440	0.04%	4,627,246	0.39%	4,647,186	0.82%	4,657,726	1.05%	4,819,199	4.55%	5,037,176	9.28%
$60,000 - $74,999	4,373,024	4,419,967	1.07%	4,393,693	0.47%	4,373,025	0.00%	4,386,845	0.32%	4,401,939	0.66%	4,419,403	1.06%	4,534,778	3.70%	4,701,734	7.52%
$75,000 - $99,999	3,933,134	3,965,169	0.81%	3,946,786	0.35%	3,933,135	0.00%	3,943,070	0.25%	3,953,394	0.52%	3,956,143	0.58%	4,046,434	2.88%	4,162,654	5.84%
$100,000 - $149,999	2,582,719	2,590,173	0.29%	2,585,645	0.11%	2,582,720	0.00%	2,588,003	0.20%	2,592,772	0.39%	2,585,812	0.12%	2,634,642	2.01%	2,687,556	4.06%
$150,000 or above	1,539,052	1,541,054	0.13%	1,539,771	0.05%	1,539,053	0.00%	1,541,726	0.17%	1,543,929	0.32%	1,541,666	0.17%	1,562,810	1.54%	1,586,931	3.11%
TOTAL not including ACCESS and LIFT	**63,278,875**	**64,435,802**	**1.83%**	**63,753,436**	**0.75%**	**69,982,392**	**10.59%**	**63,702,665**	**0.67%**	**64,284,232**	**1.59%**	**63,766,464**	**0.77%**	**69,194,195**	**9.35%**	**75,743,818**	**19.70%**
SUBTOTAL trips with HHI <$35K	**34,026,314**	**34,880,603**	**2.51%**	**34,365,944**	**1.00%**	**40,630,713**	**19.41%**	**34,338,483**	**0.92%**	**34,796,519**	**2.26%**	**34,271,439**	**0.72%**	**38,653,009**	**13.60%**	**43,859,654**	**28.90%**
New 'equity' trips (<$35K)		**854,289**		**339,630**		**6,604,399**		**312,169**		**770,204**		**245,125**		**4,626,695**		**9,833,340**	

3. Fiscal Analysis by Scenario

	Scenario 1 (Baseline)	Scenario 2 (Extended YOP)		Scenario 3 (Transitional YOP)		Scenario 4 (Income Based Free < 100% FPL)		Scenario 5 (User Type Reduced)		Scenario 6 (User Type Zero Fare)		Scenario 7 (Higher Education)		Scenario 8 (Systemwide Reduced)		Scenario 9 (Systemwide Zero Fare)	
Fiscal Factors			Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1		Change from Scenario 1
Fare Revenues	$64,974,039	$57,856,601	-10.95%	$62,105,337	-4.42%	$46,125,978	-29.01%	$62,397,347	-3.97%	$58,711,938	-9.64%	$60,341,743	-7.13%	$36,686,318	-43.54%	$2,449,068	-96.23%
Operating & Maintenance Costs	$430,907,597	$433,851,156	0.68%	$432,019,552	0.26%	$449,383,044	4.29%	$431,969,281	0.25%	$433,423,895	0.58%	$432,172,637	0.29%	$446,656,374	3.65%	$467,340,345	8.45%
Administrative costs for means-tested program	$0	$0	#N/A	$0	#N/A	$2,900,000	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A
Savings from discontinued fare collection	$0	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$0	#N/A	$12,900,000	#N/A
Change in Net Operating Support (NOS)		$10,060,996	2.75%	$3,980,657	1.09%	$40,223,508	10.99%	$3,638,376	0.99%	$8,778,399	2.40%	$5,897,336	1.61%	$44,036,497	12.03%	$86,057,719	23.52%