

TO: Chairman and Board of Trustees

FROM: Administrator

Resolution of the Central Oklahoma Transportation and Parking Authority (COTPA) Board of Trustees to Receive the Recommended Fare Change Policy, Fare Collection Strategy, and Fare Schedule Prepared by Fare Study Consultant, Four Nines Technologies (Four Nines).

**Background** On June 2, 2016 the board approved a RFP seeking a professional services agreement to establish a Fare Policy and evaluate EMBARK's fare structure. The RFP was advertised on June 9th and 21st, 2016. The selection committee recommended Four Nines Technologies and on October 7, 2016 the board authorized the Administrator to negotiate and enter into a contract with Four Nines Technologies for fare study consulting services.

Since that time, Four Nines has collaborated with EMBARK staff to review current fare schedules and fare collection and past practices for fare changes. Four Nines conducted public outreach in the form of surveys and "Meet the Planner" listening sessions at both the Transit Center and the mini hub serving Routes 23, 11, 38 and 9. In addition, Four Nines and EMBARK staff conducted public meetings and organized focus groups of both transit customers and non transit customers in order to gather input for final recommendations.

Using feedback received from the various public engagement efforts, comparisons to peer bus systems and streetcar systems and previous experience with similar projects, the consultants have developed a Fare Change Policy, a Fare Collection Strategy (mobile ticketing) and a Fare Schedule that includes establishing a fare for the Oklahoma City Streetcar. The recommendations are presented to the board for consideration and following receipt of the recommendations, staff will initiate additional public engagement and prepare the Fare Change Policy and the Fare Schedule to be considered for adoption by the board.

**Source of Funds** Public Transportation Operating Fund

**LFR Issue** Community Relations

**Review** Public Transportation and Parking Department and Municipal Counselor's Office

**Recommendation:** Receive the report



Jason Ferbrache  
Administrator

**RESOLUTION OF THE CENTRAL OKLAHOMA TRANSPORTATION AND PARKING  
AUTHORITY BOARD OF TRUSTEES TO RECEIVE THE FARE CHANGE POLICY, FARE  
COLLECTION STRATEGY AND FARE SCHEDULE RECOMMENDATION REPORTS  
PREPARED BY FOUR NINES TECHNOLOGIES**

**WITNESSETH**

**WHEREAS**, on June 2, 2016 the board approved a RFP seeking a professional services agreement to establish a Fare Policy and evaluate EMBARK's fare structure; and

**WHEREAS**, on October 7, 2016 the board authorized the Administrator to negotiate and enter into a contract with Four Nines Technologies (Four Nines) for fare study consulting services; and

**WHEREAS**, Four Nines has collaborated with EMBARK staff to review current fare schedules and fare collection and past practices for fare changes; and

**WHEREAS**, using feedback received from the various public engagement efforts, comparisons to peer bus systems and streetcar systems and previous experience with similar projects, Four Nines has developed a recommended Fare Change Policy, a Fare Collection Strategy (mobile ticketing) and a Fare Schedule; and

**WHEREAS**, recommendations are presented to the board for consideration; and

**WHEREAS**, following the Board's acceptance of the recommendations staff will initiate additional public engagement and prepare the final Fare Change Policy and the Fare Schedule to be considered for adoption by the board;

**NOW, THEREFORE, BE IT RESOLVED** that the Chairman and Trustees of Central Oklahoma Transportation and Parking Authority receive the Fare Change Policy, the Fare Collection Strategy and Fare Schedule recommendation reports prepared by Four Nines Technologies.

**APPROVED** by the Trustees and **SIGNED** by the Chairman of the Central Oklahoma Transportation and Parking Authority this 15<sup>th</sup> day of December, 2017.

**CENTRAL OKLAHOMA TRANSPORTATION  
AND PARKING AUTHORITY**

**ATTEST:** (Seal)



Chairman

  
Secretary

**REVIEWED** for form and legality.



Assistant Municipal Counselor



# Fare Change Policy

December 1, 2017

# EMBARC Fare Change Policy

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# EMBARC Fare Change Policy

## Introduction

In 2017, EMBARK initiated a fare study to establish a fare policy, evaluate EMBARK's fare structure, and develop a fare collection strategy. This Fare Change Policy is an outcome of the fare study. The Fare Change Policy also reinforces the 5-Year Board Initiatives that were adopted by the COTPA Board of Trustees on September 2, 2016.

In addition to the transit services provided under the EMBARK family of services, COTPA also provides public parking, vanpool, and bike share services in Oklahoma City and is investigating opportunities to integrate the payment of parking charges and bike share fees with transit fare products, by creating multimodal fare payment options. To the extent that parking and bike share fees are integrated with transit fare products that support multimodal fare payment, the Fare Change Policy also applies to parking, vanpool, and bike share fees.

The EMBARK Fare Change Policy is intended to support EMBARK's fare policy goals and the resulting fare collection strategy as well as COTPA's 5-Year Board Initiatives. The goal of the fare policy and fare collection strategy is a fare system that:

- Provides choices for customers that are easy to understand, explain, and use,
- Attracts new customers and additional trips from existing customers,
- Promotes multimodal fare integration and trip making,
- Uses fare collection technology to enhance fare payment options for customers and assist in fare enforcement,
- Is equitable and takes into consideration a customer's ability to pay,
- Achieves fare revenue needs and strives to achieve EMBARK's farebox recovery revenue targets,
- Accommodates accounting and reporting needs, and
- Considers transit industry best practices in fare technology for the different modes while taking into consideration the costs of the technology and approaches used by similar size peers.

## Fare Change Policy Objectives

The purpose of the EMBARK fare change policy is to provide guidance to EMBARK staff in planning and implementing fare changes for all of the public transportation services EMBARK provides. The objectives of defining and adopting a fare change policy are to:

- Ensure that fares are reviewed on a regular basis as part of ongoing annual financial planning, so that transportation operations remain sustainable for EMBARK and affordable for its customers.
- Provide a basis for evaluating fare changes, including the introduction of new fare programs, as well as fare increases or reductions, and changes to fare policies and fare structure, by defining criteria for program eligibility, and considering factors such as fare revenue impacts, administrative costs, data needs, fare collection and enforcement, operating impacts, and documenting agreements.

- Provide a basis for triggering fare changes by establishing farebox recovery targets that consider fare revenues relative to operating costs, and recognize differences in the costs of providing different services as well as the role of fares in attracting and retaining customers.
- Recognize that there is a regional interest in multimodal fare integration, using fare policies and/or fare collection technology to facilitate and broaden the use of public transportation, such as by using transit or bike share to meet first and last mile needs of drivers and their passengers who park in COTPA parking facilities, encouraging commuters to use public transportation for both commute and non-commute trips, and providing access to a variety of public transportation services.

## Scope and Authority

This policy governs planning, adoption, and implementation of all fare changes, including fare increases and decreases as well as changes to the fare structure,<sup>1</sup> and reserves to the COTPA Board of Trustees the authority for all fare changes. Staff are responsible for planning fare changes, analyzing fare options that meet EMBARK's revenue needs and other fare policy goals, obtaining public input, conducting fare equity analyses, making recommendations to the Board of Trustees, and implementing fare changes adopted by the Board of Trustees.

The fare change policy encompasses the fares for all of the public transportation services operated by EMBARK, including:

- Fixed route bus
- Streetcar (which is scheduled to begin operations in late 2018)
- Paratransit
- Ferry
- Vanpool
- Bike share

## Context for Fare Changes

EMBARK's operating costs must be fully covered by a combination of fare and non-fare operating revenues. Therefore, fares must be set with the objective of generating sufficient revenue to cover operating costs that are not covered by non-fare operating revenues.

The primary sources of revenue for EMBARK operations include fare revenues (including ferry charters, vanpool, and bike share fees as well as transit and paratransit fares), City general funds, federal grants, and other public reimbursements. Additional sources of revenue include state and local grants, advertising, and interest. Most of these revenues do not increase automatically with inflation, but require adjustment to support and maintain operations. Transit fares represent the largest source of transit revenue that is under COTPA's control.

The overall intent of this policy is to plan for routine fare reviews on a regular basis by monitoring farebox recovery and a fare-related performance metric, on an on-going basis. This approach is designed to hold fare increases to modest levels by triggering the need for fare changes and adopting and implementing them as they are needed. Small, regular fare

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<sup>1</sup> Fare structure includes but is not limited to fare products, fare programs, fares based on distance traveled, and fares based on time allowed for travel and applies to all modes of service, individually and as a whole.

increases benefit customers and EMBARK. Customers benefit because they recognize that transit prices, like other costs, increase routinely but at modest levels that can be planned for and absorbed more easily than infrequent and higher increases. EMBARK benefits because it can count on steady, predictable income to plan, provide, and sustain quality service. Since farebox recovery results may trigger a fare review, EMBARK will also work to manage the operating expenses that also impact the farebox recovery ratio

## Fare Change Planning

The COTPA Board of Trustees will review fares and fare revenue projections annually, as part of the budget process. For this purpose, the COTPA Board of Trustees will set farebox recovery targets for each transit mode operated under the EMBARK service umbrella: fixed route bus, streetcar, paratransit, ferry, vanpool, and bike share. The farebox recovery targets will define the share of modal operating costs that will be covered by fare revenue. Farebox recovery target(s) will be set for a five (5) year forecast period, taking into consideration factors such as expected growth in service levels, ridership, fare revenue, non-fare revenue, and operating costs. Targets are set to provide some stretch from current farebox recovery levels, and it is expected that EMBARK services will improve and achieve their modal targets over the five-year period.

Factors that will help to determine whether and how much to change fares include actual and projected farebox recovery ratios by mode, actual and projected ratio of average fare to base fare, and projected revenues, operating costs, and ridership, as well as the fare policy goals stated in the Introduction to the Fare Change Policy. Applying these factors in considering fare changes recognizes that there is a need to allocate ridership and fare revenue associated with multimodal fare products to the modes on which they are used. Other factors that will be recognized in planning fare changes include:

- Ridership trends and objectives
- Fare collection and fare payment strategies
- Changes to EMBARK services
- External mandates that apply to fare-related metrics (e.g., farebox recovery requirements), constraints on fare pricing (e.g., paratransit fares, mandated discounts), and the ability to cover scheduled bond payments
- Public input
- Results of Title VI fare equity analyses

The following process will be adhered to in order to consider and implement a fare change in accordance with this policy:

- Annually, in conjunction with the annual budget process, EMBARK management will prepare and submit a report to the Board of Trustees assessing transit fares relative to inflation, peer fares and other performance indicators, actions taken to manage growth in operating costs, performance against farebox recovery targets, pass usage rates and pricing multiples, financial need, and other relevant information.
- If a fare change is warranted based on the analysis, EMBARK management will recommend changes to the existing fare structure and pricing. At a minimum, recommended fare changes will consider payment options for customers; impacts on operations, fare collection, and fare enforcement; expected ridership and revenue impacts; and projected farebox recovery and average fare.



- The COTPA Board of Trustees, after reviewing the management report and recommendations(s), will make a determination on how to proceed. If the Board of Trustees determines that no change is necessary, no additional action will be required until the next annual review cycle.
- If the COTPA Board of Trustees determines that a change is warranted to the fares charged the general public:
  - The COTPA Board of Trustees will provide management with direction as to the fare policy to be presented for public comment.
  - EMBARK management will advertise and conduct public meetings on fares consistent with laws and regulations and EMBARK's Public Participation Plan.
  - Public meetings will be held on the proposed fare change and public comments will be documented in accordance with the Service & Fare Changes Procedure in the Title VI Program.
  - A fare equity analysis of the recommended fares will be completed consistent with EMBARK's Title VI Disparate Impacts and Disproportionate Burdens Policy for Major Service and Fare Changes, once COTPA operates 50 or more fixed route vehicles in peak service.
  - EMBARK management will consider the public comments received and the findings of the Title VI fare equity analysis, and prepare a report recommending appropriate action by the Board.
  - A public hearing will be conducted on the fare change prior to COTPA Board of Trustees action on fare change recommendations.
  - The COTPA Board of Trustees will determine whether to implement a fare change.
  - If a fare change is adopted, management will prepare and execute an implementation plan for the new fares.
- Within one year of action by the Board of Trustees to adopt a fare change or make a finding that no change is necessary, management will prepare and submit a report reviewing fares as noted in the first bullet above.

EMBARK management will consider the following factors, at a minimum, in evaluating new fare programs:

- Program eligibility, including implications of a proposed program for maintaining fare equity
- Funding requirements to cover the impact of any fare revenue lost as a result of a fare change, including opportunities to reduce operating costs and increase fare revenues
- Administrative costs of implementing and managing a fare change, particularly a new fare program
- The ability to track data required for programs that are reimbursed by third parties on the basis of a metric such as ridership
- The ability to collect and enforce the fare on the services EMBARK operates and with the available fare collection systems and equipment
- The impact of fare payment and enforcement on operations

- Formalizing and documenting agreements with external organizations to establish responsibilities, program eligibility, pricing, contract term, etc., by establishing Memoranda of Understanding (MOUs)

## Performance Metrics

Farebox recovery targets and fare revenue requirements will be determined for each mode by estimating modal operating costs, the non-fare revenues available to cover them, and the fare revenues needed to cover the remaining operating costs. Farebox recovery ratios are calculated as follows:

$$\text{Farebox Recovery Ratio} = \text{Fare Revenue divided by Total Operating Costs}$$

Fare revenue is defined as revenues earned from carrying passengers, including special programs such as reduced passes or ticket prices for students, seniors, or individuals with disabilities. Fares may be paid by the rider or by an organization (e.g., an employer, a university) on behalf of the rider. Fare revenues do not include subsidies, fare assistance to provide a reduced or free fare, or local matches. Therefore, fare revenues include fares paid by riders on-board transit, paratransit, or other vehicles providing public transportation services; transit fare products purchased before boarding; monthly fees paid by vanpool riders; and fees paid for bike share programs. Fare revenues also include payments made by employers on behalf of employees, universities on behalf of students, or conferences on behalf of attendees, as well as fare products purchased by non-profit organizations on behalf of their clients.

Operating costs are defined as the expenses associated with the operation of the public transportation agency and the goods and services purchased (i.e., consumable items with a useful life of less than one year or an acquisition cost which is the lesser of the capitalization level established by the agency for financial statement purposes or \$5,000). Capitalized costs, vehicle capital lease expenses, and depreciation costs are not included as operating expenses.

Farebox recovery targets are set for the five-year period from FY2019-FY2022, with the intent of increasing the proportion of operating costs to be covered over that period, and achieving the target ratio by the end of the period.

The following modal farebox recovery targets are recommended by EMBARK management and will be approved by the COTPA Board of Trustees with the adoption of the Fare Change Policy. The streetcar farebox recovery target will be estimated at the end of the first year of service and set after the second year of service.

Mode	FY2017 Farebox Recovery Ratio	FY2019-FY2022 Farebox Recovery Target
Fixed Route Bus	11.8%	13.0%
Streetcar	Not available	To be determined for FY2022 using FY2020 and FY2021 performance data
EMBARK Plus paratransit	8.6%	9.5%
River Ferry	3.9%	4.3%
Bike Share	31.6%	34.8%



# Fare Collection Strategy

December 1, 2017

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## Background

As EMBARK prepares to debut the Oklahoma City Streetcar, the agency is exploring fare collection technology options for the streetcar as well as possibilities for intermodal fare integration. To aid in this effort, the agency has asked Four Nines Technologies for assistance in developing a comprehensive Fare Collection Strategy. This strategy is part of larger study to establish EMBARK fare policy and evaluate its fare structure.

This strategy will touch on all modes under the EMBARK umbrella of services, including fixed route bus, streetcar, paratransit, and ferry with potential integration with parking and bikeshare. It will provide guidance for the agency in the near-term as the OKC Streetcar comes online. The strategy will also speak to the long-term by providing EMBARK with an overview of emerging technologies in the fare collection space and how those technologies might benefit the agency and its users in the future.

## Process

In creating this Fare Collection Strategy, Four Nines worked with a variety of EMBARK stakeholders. Meetings were conducted with EMBARK staff from numerous departments:

In addition to stakeholder interviews to understand the strengths and weaknesses and gauge interest in recent fare collection options and trends, a series of meetings have been conducted throughout the study to educate EMBARK on industry best practices and trends, including:

- Stakeholder interviews on January 19-20, 2017
- Fare Collection Technology History, Options, and Trends on April 25, 2017
- Streetcar Fare Enforcement & Fare Collection Alternatives on April 25, 2017
- Mobile Ticketing Vending Vendor Demos on June 2, 2017 (conference call)
- Mobile Ticketing Strategy - Four Nines' Recommendation on July 14, 2017 (conference call)
- Streetcar Fare Enforcement on August 3, 2017
- Ticket Vending Machines & Fare Enforcement Equipment on August 18, 2017 (conference call)
- Review of the Fare Collection Strategy on October 3, 2017

Four Nines incorporated best practices from working with other agencies to plan and implement fare collection systems when we evaluated the strengths and weaknesses of EMBARK's current fare collection system and identified opportunities. This assessment is included in the Summary of Findings report.

Four Nines also reached out to numerous peer agencies, including Cincinnati, Detroit, Atlanta, and Little Rock. Interviews with these operators, all of whom operate a streetcar service, shed light on fare enforcement, fare integration, and fare technology. Four Nines documented the lessons learned into the Streetcar Peer Review technical memorandum.

This fare collection technology strategy incorporates these findings, industry best practices & lessons learned, and direction based on Four Nines recommendations and input received from EMBARK staff.

## Goals and Objectives

To guide their fare collection technology strategy, EMBARK established an overarching vision for its system in the form of goals and accompanying objectives. Goals can span a wide array of elements in technology, service, operations, management, and beyond.

The goal of the fare policy and fare collection strategy is a fare system that:

- Provides choices for customers that are easy to understand, explain, and use,
- Attracts new customers and additional trips from existing customers,
- Promotes multimodal fare integration and trip making,
- Uses fare collection technology to enhance fare payment options for riders and assist in fare enforcement,
- Is equitable and takes into consideration a rider's ability to pay,
- Achieves fare revenue needs and strives to achieve EMBARK's farebox recovery revenue target,
- Accommodates accounting and reporting needs,
- Considers transit industry best practices in fare technology for the different modes while taking into consideration the costs of the technology and approaches used by similar size peers, and
- Strives for high levels of system reliability.

**Provides choices for customers that are easy to understand, explain, and use:** Aiming for simplicity in a fare policy and fare collection technology gives riders a greater sense of personal mobility by enabling them to use EMBARK's services easily. The ability for a rider to readily look up the fare structure and pay with a smartphone in their pocket can support the rider's decision process and make travel from point A to B easy and convenient.

**Attracts new customers and additional trips from existing customers:** From discussions with EMBARK staff, creating a system which continues to serve its existing riders well is a top priority for the agency in addition to attracting new customers. To encourage existing customers to increase their use of the system and to attract new customers to the system, the fare collection system should minimize barriers to use the system by providing a convenient way to pay for services and transfer between modes.

**Promotes multimodal fare integration and trip making:** With the introduction of streetcar, it will be important for customers to transfer from bus to streetcar as well as from COTPA parking garages. Thus, facilitation of intermodal trips is a critical a fare collection strategy goal for EMBARK to maximize mobility and use of streetcar.

**Uses fare collection technology to enhance fare payment options for riders and assist in fare enforcement:** Emerging fare collection technologies can provide riders with greater flexibility and improve the rider experience by increasing the convenience of using public transit. These technologies can be paired with complementary fare enforcement applications that make proof-of-payment systems easier to monitor for fare evasion.

**Is equitable and takes into consideration a rider's ability to pay:** From a Title VI fare equity perspective, it is important that the fare policy and fare collection system are considerate of different riders' financial needs and ability to use cash. An agency can improve affordability by rewarding regular riders through discounted passes, including by finding innovative ways to introduce new fare products with its new fare collection technologies, such as fare capping that

enables riders to pay towards a pass as they go. As EMBARK implements new fare technologies and promotes electronic fare collection to try to minimize cash collection, it will be critical to continue to provide the option for a customer to pay with cash. EMBARK can also look for ways to provide ways for cash customers to use new technologies, such as mobile ticketing, by working with a vendor to enable cash customers to load cash to their accounts.

**Achieves fare revenue needs and strives to achieve EMBARK's farebox recovery revenue target:** The fare collection system must promote fare payment and minimize fare evasion by making it easy to pay and offering enforceable fares, especially on the proof-of-payment OKC Streetcar.

**Accommodates accounting and reporting needs:** New fare collection technologies can provide enhanced data collection capabilities. New technologies can increase the amount and quality of the data in aggregate and by mode. Technological advances in transit can enable agencies to collect data that creates a clearer picture of rider behavior and trends. This geocoded data can be used to analyze routes, stop placement, and other elements of service to create a system that works more efficiently and effectively for riders. Data from fare enforcement can also assist in revenue allocation for intermodal fare products.

**Considers transit industry best practices in fare technology for the different modes while taking into consideration the costs of the technology and approaches used by similar size peers:** EMBARK has the benefit of being able to look to peers who have already attempted to address many of the goals listed here through innovative fare policies and technologies. As the agency decides what is right for their services and Oklahoma City, they can draw on the experiences of others to avoid common pitfalls and build on existing successes. The ability to extrapolate from others' experiences requires an acknowledgement that each city is different, and some agencies serve as closer examples to EMBARK than others. Overall, there is much that can be learned from peer agencies.

**Strives for high levels of system reliability:** While not a defined goal by EMBARK, the importance of system reliability is critical for a successful fare collection system. Related to operations and maintenance, EMBARK should establish goals regarding the performance of the fare collection technology. Lapses in reliability, such as maintenance issues, can negatively impact ridership and revenue. The nature of TVM-customer interactions as well as mobile ticketing can greatly influence customer satisfaction with regards to the whole system, and problems in this arena should be identified and addressed early on to prevent negative public perceptions of EMBARK's fare collection system, which could in turn impact ridership and revenue.

## Metrics for Success

EMBARK should select a set of metrics to evaluate the agency's progress based off of the fare system goals and objectives established in the previous section. The more metrics EMBARK selects, the more holistic the analysis of the agency's strengths and weaknesses. These metrics should be measurable, either quantitatively or qualitatively, and tied to specific goals.

Metrics can be collected from a number of sources. Some will automatically be collected by the technology system such as the number and types of passes sold. This data can be augmented by surveys that evaluate, for example, ease of use of the fare collection system and general

rider satisfaction. The quantity and quality of fare enforcement will determine whether or not additional insights can be gained from this resulting data as well.

EMBARK will want to evaluate its system to see what metrics would be easiest for it to collect and what metrics are most valuable to the agency.

<b>Goals</b>	<b>Potential Metrics</b>
Provides choices for customers that are easy to understand, explain, and use	<ul style="list-style-type: none"> <li>• Customer satisfaction surveys</li> <li>• Fare evasion rates</li> </ul>
Attracts new customers and additional trips from existing customers	<ul style="list-style-type: none"> <li>• Ridership</li> <li>• Identification of new riders from customer satisfaction surveys</li> </ul>
Promotes multimodal fare integration and trip making	<ul style="list-style-type: none"> <li>• Number of multimodal trips</li> </ul>
Uses fare collection technology to enhance fare payment options for riders and assist in fare enforcement	<ul style="list-style-type: none"> <li>• Customer satisfaction surveys</li> <li>• Uptake rates of new fare collection technologies</li> </ul>
	<ul style="list-style-type: none"> <li>• Fare evasion rates</li> <li>• Number of riders inspected</li> </ul>
Is equitable and takes into consideration a rider's ability to pay	<ul style="list-style-type: none"> <li>• Customer satisfaction surveys</li> </ul>
Achieves fare revenue needs and strives to achieve EMBARK's farebox recovery revenue target	<ul style="list-style-type: none"> <li>• Fare evasion rates</li> </ul>
Accommodates accounting and reporting needs	<ul style="list-style-type: none"> <li>• Data availability for revenue allocation, NTD reporting, planning, etc.</li> </ul>
Considers transit industry best practices in fare technology for the different modes while taking into consideration the costs of the technology and approaches used by similar size peers	<ul style="list-style-type: none"> <li>• Procurement &amp; design process incorporates best practices</li> </ul>
System reliability	<ul style="list-style-type: none"> <li>• System up time</li> <li>• Mean time between failures (MTBF)</li> <li>• Customer satisfaction surveys</li> </ul>



## Approach

For the OKC Streetcar's fare collection, EMBARK will install wayside ticket vending machines (TVMs) at each streetcar station. Riders will use these machines to pay their fare and receive a paper ticket. The TVMs will require exact change to reduce the complexity of the machines and thus lower costs. By structuring operations so that customers purchase their fare before they board the streetcar, wayside TVMs enable customers to board through all doors, reducing dwell time at each stop and speeding up operations.

To supplement the wayside TVMs and in an attempt to expand EMBARK's ridership more generally, the agency is pursuing mobile ticketing technology. Mobile ticketing enables a customer to purchase their fare using a smartphone or tablet, on which the ticket is then housed. Mobile ticketing would also help facilitate integration between bus and streetcar because a mobile ticket could be used to board either service. Current EMBARK fixed route users have expressed this integration as highly desirable.

COTPA garage users have also expressed a desire for integration with streetcar. To meet this demand, EMBARK could allow each parking smart card given to monthly garage users or a paper daily parking garage ticket to be valid for one riders' fare on streetcar. This provides an integration benefit to COTPA garage users while still making financial sense by not allowing an entire carload of people to be eligible for the free fare using a single parking smart card or paper ticket.

Fare collection will be enforced on buses and ferries upon boarding. For mobile tickets, this will be a visual inspection. Methods such as animation and color changes will be used to reduce fraud. TVM tickets will be visually validated. Pre-activated Unlimited Passes that are valid on streetcar and bus will be electronically validated by the farebox on bus and visually validated on streetcar since electronic validation of Unlimited Passes on streetcar would require a backpack on the fare inspection device to validate magnetic stripes passes.

To combat fare evasion, fare enforcement officers will periodically board vehicles to check that each passenger has a valid proof of payment (PoP). Inspectors will carry mobile devices with the agency mobile application loaded. The app will electronically validate mobile tickets. It will also log any visually inspected tickets. For tickets issued from the TVMs, fare inspection officers could visually inspect the ticket or scan a QR code printed onto the ticket in order to check for validity. For mobile ticketing, fare inspection officers could have a number of options depending on the final details of the mobile app, including visual inspection, QR code scan, and/or NFC inspection. For visual inspection, the verification process would include one or numerous techniques to inhibit people from simply taking a screenshot of a valid ticket. Techniques include:

- A moving background,
- Ticket colors along with images, letters or words that change daily and are only known to fare enforcement officers and bus and streetcar operators, and
- An interface that performs a special action when touched such as sending shooting stars across the screen or changing colors.

Fare inspection officers would carry an Android smartphone or tablet with them to conduct these inspections. As part of the procurement of the mobile ticketing app, EMBARK should require the vendor to develop a fare inspection app for the agency. This agency inspection app will be

loaded onto the smartphones or tablets from which the officers will perform multiple inspection tasks including:

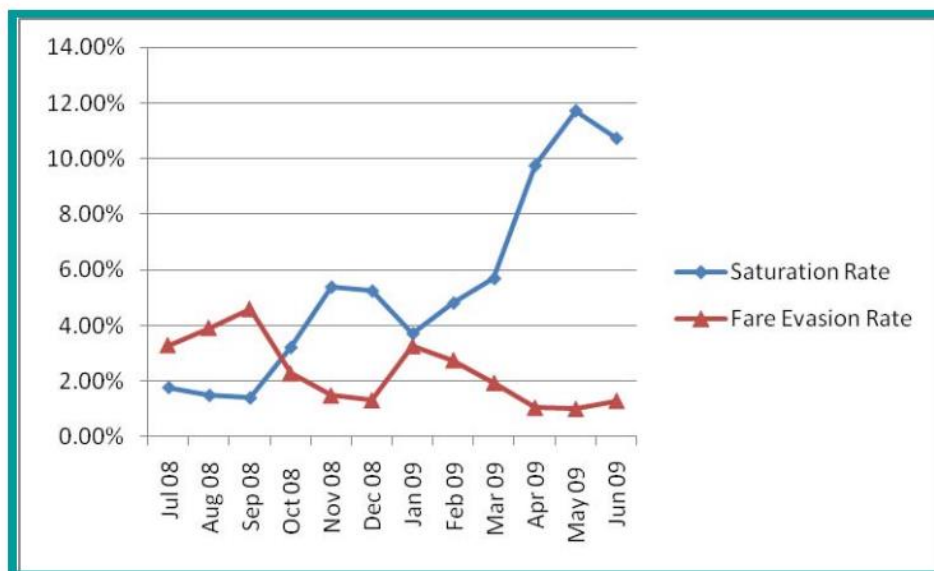
- Logging of TVM paper ticket and mobile ticketing inspections of QR codes using the device's camera
- Manual logging of visual inspections of TVM and parking garage paper tickets as well as mobile tickets
- Logging mobile ticketing using NFC
- Logging ISO 15639 based parking smart cards using NFC

If a fare enforcement officer encounters a rider without valid proof of payment, they will have the choice to issue a citation or to ask the rider to buy a ticket. Tickets and citations will be written on paper slips carried by the officer. Some agencies have chosen to issue tickets and citations using bluetooth printers, but these printers can be unreliable and require maintenance and upkeep. Paper tickets simplify the process and reduce technical difficulties, making fare enforcement more efficient. While there has been discussion about allowing fare enforcement officers to collect fares onboard, this is not recommended as it would require the ability to process credit and debit card and issuance proof of payment.

EMBARC should seek to establish a fare enforcement level that keeps fare evasion to an acceptable rate while remaining cognizant of the agency's financial and personnel restraints. The relationship between fare inspection rates and fare evasion rates is generally converse, meaning that as fare inspection rates go up, fare evasion rates go down. Since fare inspection requires significant resources, EMBARK must weigh the tradeoffs between a higher inspection rate and higher fare evasion, deciding at what point the benefits of higher inspection rates start to outweigh the costs.

In 2010, the Los Angeles County Metropolitan Transportation Authority (LACMTA) studied the relationship between fare inspection rates and fare evasion rates on its system. Their published study includes the chart below:

**Chart 1: Metro Saturation and Fare Evasion Rates for FY 2009**



Source: <http://media.metro.net/images/oig/10-AUD-05%20Rail%20Fare%20Inspections%204-15-10.pdf>

Note that LACMTA uses the term saturation rate in lieu of inspection rate. They represent the same concept. Based off of the numbers in the chart, Four Nines has estimated the number of inspectors required to achieve a fare evasion rate of 1%.

Our calculations is based on a set of assumptions. The first is that EMBARK is planning to operate 313 round trips per day on the Bricktown and Downtown lines per the streetcar route and operations plans, which results in just under 100,000 trips annually if the streetcar operates 6 days a week. To achieve a 1% fare evasion rate, EMBARK should aim to inspect 10% of the trips per service day, or 32 trips per day. Assuming an inspector can check 5 trips per hour according to streetcar timelines, this results in 6.4 inspection hours required on average per service day. Best practices suggest that these inspection hours should be at varied hours to maintain the unpredictability of inspections. If we extrapolate this to 300 service days in a year, we estimate a need for 1,920 inspection hours per year or roughly one full time equivalent (FTE). This is consistent with the TCRP study that looked at the number of inspectors an agency employed (FTEs) related to ridership. The study found that average number of inspectors per 1,000 daily riders is 0.51. (Source: <http://www.trb.org/Publications/Blurbs/166757.aspx>)

While this analysis provides a good outline for the pattern of thinking EMBARK should follow, there are caveats to these numbers. The LACMTA study does not necessarily represent a statistically valid finding for the entire LACMTA system. Additionally, the context of the Oklahoma City Streetcar is very different from the proof-of-payment rail systems located in the Los Angeles area. Thus, these findings should not be taken at face value, but instead viewed through a critical lens for the value they can bring to EMBARK in forming its fare inspection plan.

## System Components

EMBARK's fixed route and paratransit vehicles currently use onboard GFI Odyssey fareboxes for fare collection. Riders can also purchase fares online, at the Downtown Transit Center, and through a limited retail network. The Oklahoma River Cruise uses Square for fare collection, and the Spokies bike share is run through its own mobile and bike share kiosk system.

In order to fulfill the agency's vision for fare collection, new technologies will have to be purchased to augment the current system. Details of the system components that must be acquired are outlined below.

### Mobile Ticketing

The implementation of mobile ticketing technology will require EMBARK to purchase the platform from a mobile ticketing app vendor. Many different packages and customizations are available from a variety of vendors to meet the exact needs of the agency. It should be recognized, however, that with increasing complexity (i.e. anything that goes beyond what a vendor offers as the "base model" of an app) comes a longer implementation timeline and higher costs to the agency.

EMBARK will work with a consultant to better define the requirements for the mobile ticketing solution. EMBARK must decide what the agency considers mandatory requirements versus desired requirements. Mandatory requirements represent the threshold a vendor must reach in order to be considered during the procurement process. Desired requirements represent

elements the agency would like to see, but that will be weighed against other factors such as cost and influence on the implementation timeline. These factors will help the agency decide whether to follow through with incorporating some, all, or none of the desired requirements into the final mobile ticketing platform.

During the procurement process, EMBARK will need to be cognizant of the customer service support offered by various vendors. Support in this arena from the chosen vendors will be essential to quickly and effectively address customer concerns and complaints regarding the fare collection system. This is especially true for mobile ticketing, as some issues that arise are likely best handled by the vendor, since they are most familiar with the app's interface. They also have institutional knowledge related to common customer needs when first adapting to mobile ticketing technology that EMBARK lacks. Therefore, a vendor's willingness to support and engage with EMBARK staff should also be a criteria used by which to judge mobile ticketing vendor proposals.

A list of high-level requirements identified during the EMBARK Fare Study is included in Appendix A.

### ***Customer Mobile App***

EMBARK will want to procure a customer mobile ticketing app designed for both iOS and Android systems. The agency should also make it explicit during the procurement process that the vendor will be responsible for keeping the app up to date and for offering it for download through all relevant app store platforms.

EMBARK riders will be able to download and use the mobile ticketing app to ride on fixed route buses, streetcar, paratransit, and ferry. A rider should be able to purchase and activate a mobile ticket on their device as they see a vehicle approaching, so processing times within the app will need to be quick. This gives riders more flexibility and could help with boarding times as fewer people would have to pay for a ticket as they board.

Mobile ticketing would be implemented initially with visual validation, followed by beacon validation. Implementation of mobile ticketing with visual validation will enable EMBARK to launch mobile ticketing prior to opening of streetcar because it requires the procurement of no additional technologies for the fixed route bus system. Bus operators will simply have to be trained to visually validate and then record the new mobile tickets. While the dataset from mobile ticketing with visual validation provides geolocation information, it is not as rich as mobile ticketing with electronic validation since customers may activate even when not boarding a vehicle. Thus, Four Nines recommends that EMBARK procure a mobile ticketing app that has the capability to validate using beacon technology.

Beacon-based validation is an emerging approach based on simple and proven technology. The infrastructure costs are very low compared to those for smart cards or barcodes, the enforcement is easier, and the use across modes is identical. Additionally, beacon-based validation can easily be added to a mobile ticketing system launched with visual validation. Beacons work by interacting with a person's mobile ticketing device and, in doing so, log boardings automatically with precise information on when the rider boarded and where. Beacons also have the ability to make a mobile ticket appear on a device's home or lock screen based on its proximity to a public transit vehicle. EMBARK can choose to procure beacon technology at any time. The ease of adding beacon-validation gives the agency flexibility to first see how other agencies approach beacon-based validation. Based on these real world

deployments by other agencies, EMBARK could choose to pursue beacon-based validation upon launch of the mobile ticketing system or at a later time.

### **Agency Mobile Inspection App**

Fare enforcement officers will require new technology in order to inspect riders' proof of payment onboard the streetcar. Along with the customer mobile ticketing app, EMBARK will want to procure a mobile agency fare inspection app from the same vendor. This app should have the ability to log fare inspections. Specifically, the app should be able to record visual inspection, QR code inspection using the device's camera, and NFC inspections, including inspections of ISO 15639 smart cards. This requirement currently mandates that the application be built on the Android platform as iOS devices do not currently support the ISO 15639 standard. Each of these inspections should also record information concerning the type of fare inspected (e.g. streetcar day pass, parking smart card, monthly bus pass, full adult fare, reduced fare). All of this data should be accessible by EMBARK for their records in an easy to use and manipulatable format. This will aid the agency in modifying its fare inspection policies, schedule of fares, and fare allocation between modes if necessary based on the data collected. The agency app should require each user/enforcer to sign in with a set of individual credentials. This step will help EMBARK keep its fare collection officers accountable for reaching the inspection quotas necessary to control fare evasion.

### **Android Smartphones and/or Tablets**

Four Nines recommends that EMBARK procure the smartphones and tablets used to carry out inspections using the agency mobile app separately from the mobile ticketing app procurement. Usually, separating these two procurements results in an agency receiving a more competitive price for the inspection devices. The device procurement process should specify that the vendor will be responsible for providing management tools for the devices, including updates and security. Depending on smartphone capabilities needed for fare enforcement, EMBARK may be able to use their existing vendor for smartphones.

### **TVMs**

EMBARK is planning to purchase new ticket vending machines (TVMs) for the OKC Streetcar. At a minimum, there will be one for each of the 22 stops along the streetcar's route. Four Nines recommends that the TVMs accept cash, coins, debit cards, and credit cards to address Title VI concerns and to avoid the complications and added expense of determining an alternative means of collecting cash onboard the streetcar vehicles.

It should be noted that the streetcar program management consultant had previously suggested procuring wayside TVMs with credit and debit card capabilities, then procuring separate onboard TVMs to accept cash only. Procuring separate cash-only TVMs for the streetcar would complicate technology integration as well as fare enforcement between streetcar and bus. The decision to carry out two separate TVM procurements would also increase upfront capital costs as well as ongoing maintenance costs. For these reasons, Four Nines has outlined its recommendation above to purchase TVMs that accept bills, coins, credit cards, and debit cards.

For the TVMs, Four Nines is suggesting the agency procure "smaller-footprint" TVMs. These models take up less space on the platform and are priced below "full-featured" (larger) TVMs. The smaller footprint means the machine might require more frequent service to replace ticket/fare media and to collect bills and coins inserted into the machine. Also, certain smaller-footprint TVMs might not have all the capabilities desired by the EMBARK team. Thus,

EMBARC will need to ensure that the RFP for streetcar TVMs explicitly outlines the agency's requirements, for example that the TVMs accept cash, coin, debit cards, and credit cards.

The OKC Streetcar TVMs will distribute paper tickets. Depending decision about fare inspection, the tickets may or may not have a QR code printed on them. The tickets will not have a magnetic stripe. Procuring TVMs that print magnetic stripes which are interoperable with the GFI Odyssey fareboxes on fixed route vehicles would significantly increase equipment and integration costs. As such, magnetic stripe tickets are not recommended. While this will not limit the ability of passengers to transfer from bus to streetcar, it will create limitations in integrating the process to go from streetcar to bus. Some of these limitations may be overcome with mobile ticketing that can enable streetcar to bus transfers, but the paper tickets issued by the TVMs are unlikely to enable streetcar-to-bus transfers on their own unless they are inspected visually.

As an additional channel for ticket purchase, the existing on-street parking kiosks could easily be modified to issue streetcar tickets with QR codes that could be inspected by the inspection device. This would potentially lessen queuing at platform TVMs and for customers parking before riding the streetcar and improve the rider experience by shortening the time they spend buying the various tickets. Since revenue from parking tickets and streetcars goes to different City accounts, the on-street parking kiosks would need to be capable of segregating financial settlement based on the type of ticket sold.

The new platform TVMs could be purchased from the vendor who provided the on-street parking kiosks. This would lessen integration costs and potentially reduce maintenance costs through some commonality of parts and service requirements. If EMBARK elects to procure these two elements from the same vendor, it is important to do it within the context of selecting the best vendor for each system and while maintaining the openness of the integrations. If the parking kiosk vendor is chosen to be the best provider for the platform TVMs, EMBARK must require that any APIs they use for communication between the system or instructions they use for the generation of barcodes and other identifiers be open and public, enabling EMBARK to competitively select replacements for the individual systems.

A list of high-level requirements identified during the EMBARK Fare Study is included in Appendix B.

## Procurement Approach

49T recommends that EMBARK pursue four separate procurements to begin realizing this fare collection strategy:

1. Mobile ticketing app with fare enforcement app
2. Smartphones
3. TVMs
4. Electronic cash transaction network vendor for mobile loading (such as PayNearMe)

The first three procurements have been described above, including the reasons for their separation into individual procurements.

The fourth procurement is optional for the agency. Following through with it could help address Title VI concerns and prompt a larger share of riders to use mobile ticketing. However,

EMBARC may want to wait to evaluate the initial adoption rates of mobile ticketing and identify what the barriers to adoption are before following through with a vendor procurement.

Procuring a vendor with relationship with a variety of retailers for mobile ticketing would enable EMBARK's riders to walk into a retail outlet and load monetary value into their mobile ticketing account using cash. This type of system allows people who are unbanked to still use a mobile ticketing platform because they now have a means of using cash to purchase mobile fare media. Usually, a mobile ticketing user must have a credit or debit card number they can enter online for mobile payments.

EMBARC should, however, be cognizant of the fact that these vendors typically take a share of every transaction for themselves, thus reducing the agency's farebox revenue. There can also be an additional charge for processing credit and debit cards at retail outlets. EMBARK may want to explore the financial details of other organizations' contracts with these types of vendors before following through with the fourth procurement to see if a mobile loading agreement would be financially viable for EMBARK. As an example, PayNearMe commission rates are:

- 4% if a \$5.00 minimum fare payment can be enforced which is \$0.20 per transaction.
- 8% if no minimum fare payment is enforced which on a \$2.50 fare is \$0.20 per transaction.

## Integration Responsibilities

The mobile ticketing vendor will be responsible for several integrations. The type of integrations will depend on what integrations EMBARK identifies during the development of its mobile ticketing requirements. Potential integrations include:

- **TVM Integration:** For fare inspection, if fare inspection officers will be scanning TVM tickets to determine validity and log inspection information, the mobile ticketing vendor will be responsible to work with the TVM vendor and specify how the TVM vendor should create QR codes. This will include design and testing to ensure that the QR codes are readable by the agency mobile inspection app.
- **Parking Integration:** In the future, EMBARK could consider integrating its mobile ticketing app to integrating with its parking garage gates. This integration would require integrating the mobile ticketing and parking fare collection systems. The specific approach would be finalized during design review, but it would require either the linking of the parking and mobile ticketing back offices, or a discount code, specific to the monthly parking account, that will allow for a free ride.
- **Fare Enforcement:** The mobile ticketing vendor will be responsible for designing and building a method for logging issued tickets within the agency mobile inspection app. At the present the plan is to integrate streetcar and parking through the use of the parking garage smart cards and paper tickets. The mobile inspection app would need to enable a fare inspection officer to log a visual inspection of a paper parking ticket, scan and validate the barcode on the paper parking ticket, and read and validate an ISO 15639 parking smart cards. The mobile inspection app would also need to enable a fare inspection officer to scan and validate a paper TVM streetcar ticket or pre-purchased paper streetcar product, such as a monthly pass or convention pass. It would also need to enable the input a visual inspection of a pre-activated Unlimited Pass valid on streetcar and bus.

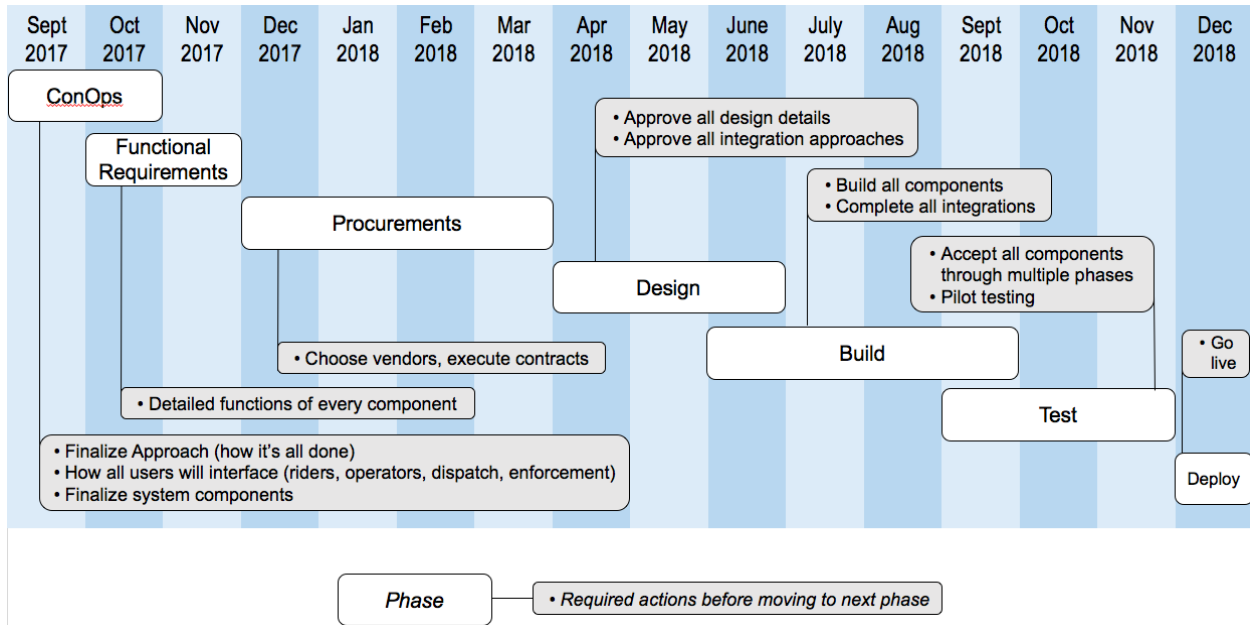
- **Retail Network:** If EMBARK selects a Electronic cash transaction network vendor for mobile loading (such as PayNearMe), the mobile ticketing vendor will need to integrate their application with vendor to enable customers to load cash to their account, which could then be used to purchase tickets and passes.

Due to the complexity of integrating magnetic stripe tickets issued by the streetcar TVMs with the GFI Odyssey fareboxes onboard the buses, magnetic stripe tickets issued by a TVM are not recommended. If pursued, they would require GenFare to specify how the TVM vendor should encode the tickets and to work with the TVM vendor through design and testing to ensure that the tickets are readable by the fareboxes.



## Action Plan

The steps required to implement this fare collection strategy are outlined below. EMBARK is on a tight schedule if they plan to have everything in place before the debut of the OKC Streetcar. This timeline can be shorted by procuring a mobile ticketing system that requires less customization, instead opting for “off-the-shelf” options that a vendor already has readily available. The same can be said of the TVM procurement process.



Phase/Task	Due Date
ConOps	October '17
Approach	
Use Cases/User Interfaces	
System Components	
Functional Requirements/SoW	November '17
Mobile Ticketing Requirements	
TVM Requirements	
Fare Enforcement Plan	
Procurement	March '18
Issue Mobile Ticketing RFP	
Evaluate Mobile Ticketing Responses	
Negotiate Mobile Ticketing Contract	
Issue TVM RFP	
Evaluate TVM Responses	
Negotiate TVM Contract	

Phase/Task	Due Date
Design	June '18
Ordinance Change to Issue Fare Evasion Citations	
Mobile Ticketing Conceptual Design	
Mobile Ticketing Preliminary Design	
Mobile Ticketing Final Design	
TVM Conceptual Design	
TVM Ticketing Preliminary Design	
TVM Ticketing Final Design	
Build	September '18
Develop Mobile Ticketing App	
Build TVMs	
Complete Integrations	
Testing	November '18
Mobile Ticketing 'Factory' Testing	
Mobile Ticketing Integrated Testing	
Mobile Ticketing Acceptance Testing	
TVM Factory Testing	
TVM Integrated Testing	
TVM Acceptance Testing	
System Integration Testing	
Pilot Testing	
System Go Live	December '18

## Future Integrations

EMBARC anticipates pursuing long-term functionality that would provide fare integration with Spokies bikeshare, integration with paratransit scheduling software, and parking access to gated COTPA parking structures. Additional potential future integrations have also been identified.

## Bikeshare

Spokies, Oklahoma City's bike share program, launched in 2012. Spokies is a BCycle bike share and is operated and maintained by Bicycle Transit Systems. EMBARK has identified multiple levels of potential Spokies integration: (1) account level integration with the Spokies back office; (2) field level integration allowing customers to get a Spokies bike with the mobile ticketing application; and (3) ticket level integration so customers can buy a Spokies pass through the mobile ticketing application. EMBARK also envisions opportunities for bike/transit

transfers (e.g. a free bike share ride after riding transit) and combination passes allowing access to both systems.

## **Paratransit Scheduling**

EMBARC currently uses Trapeze for paratransit scheduling. Long-term EMBARK is interested in integrating its mobile ticketing application with its paratransit scheduling software to identify prepayment of scheduled rides. EMBARK is also interested in offering its customers the ability to schedule and pay for paratransit rides within the app.

## **Off-Street Parking**

EMBARC manages five garages and three surface lots that use SKIDATA technologies. In order to offer a parking/streetcar pass, there is interest in the ability for the mobile fare inspection application to be able to identify valid parking garage monthly passes (ISO/IEC15693 smartcards). EMBARK may have SKIDATA walk-up kiosks produce paper tickets for the streetcar - the barcodes on these paper tickets will also need to be readable by the mobile fare inspection app as part of this procurement. EMBARK anticipates future functionality allowing parking access to gated structures using a mobile ticketing app barcode readable by the SKIDATA parking gates.

In the future EMBARK may also want to offer its customers bundled streetcar tickets with flat fee event parking through the mobile ticketing app.

## **Other Potential Future Integrations**

EMBARC is also interested in exploring other integrations in the future. Other potential future integrations are identified below:

- Links in from trip planner
- Real-time transit vehicle tracking
- On-street parking including Parkeon's Whoosh! and NuPark
- Park-and-Ride lots
- Integration with EMBARK Connect CRM app or similar ability to report issues within mobile ticketing application
- Specialty ferry cruises e.g. Haunt the River cruises with a limited number of tickets per cruise
- Enterprise operated vanpool, transit access for monthly pass vanpool customers
- Transportation Network Companies/Ride Hailing Apps (e.g. Uber and Lyft)
- Non-paratransit demand response service
- Share-A-Fare taxi voucher/coupon program
- Guaranteed Ride Home program
- Additional transportation agencies in the region

## Appendix A: Mobile Ticketing Procurement High-Level Requirements

The mobile ticketing solution shall provide a mobile ticketing app that:

- Offers a variety of fare products (e.g., single trip, 2-hour pass, day pass, monthly pass, etc.). These fare products may be for select modes (e.g., bus, streetcar, ferry, paratransit) or a combination of modes (e.g., streetcar + bus).
- Enables EMBARK to customize, introduce, or remove fare products offered without additional work by the vendor.
- Provides security measures, including use of QR code, to enable visual and optical inspection of mobile ticket.
- Enables ticket activation when smartphone is not internet-connected.
- Accepts debit, credit, and prepaid debit cards for fare payment.
- Processes and reconciles payment transactions on behalf of EMBARK.
- Integrates with sales channel vendor to enable cash riders to load money to mobile ticketing account.
- Accepts promotional codes for free or discounted rides that are unique for one-time use by an individual or one-time use by multiple individuals.
- Provides ability to distribute bulk tickets and passes to multiple people (e.g., employees, social service clients, conference or special event attendees) using codes or directed logins. Tracks activation of codes and ridership data of users.
- Creates invoice for EMBARK to issue to 3rd parties for payment-based codes or directed login distributed or activated, depending on arrangement with 3rd party.
- Uses deep links to integrate with other EMBARK apps (e.g., EMBARK Connect), EMBARK website information (e.g., schedules, route map, real-time bus departures), and third-party apps and trip planners (e.g., B-Cycle app for Spokies Bikeshare, Google maps). The links will be configurable.
- Supplies metrics to EMBARK that the agency can then use to analyze and improve service, including usage patterns and geolocational information. Reports anonymized usage patterns.
- Gathers and reports customer service metrics related to customer experience with the mobile app.
- Complies with all ADA compliance and Oklahoma state requirements including the design and accessibility guidelines associated with each operating system. Accessibility may also include developing a mobile ticketing app that is available in multiple languages according to the needs of EMBARK's ridership.
- Complies with PCI-DSS standards.
- Enables the validation of tickets using NFC or BLE battery powered vehicles mounted on the vehicle or wayside.

The mobile ticketing solution shall provide a fare inspection app to be installed onto an Android smartphone that:

- Logs fare inspection information including number of inspections and fare evasion rates. The app will also be able to log visual inspections; fare inspector will have ability to enter inspections of paper tickets that cannot be scanned and magnetic stripe tickets issued from fixed route buses using customizable predetermined options.
- Records fare evasion warnings and citation information and tracks repeat offenders. Citations will be issued tickets using handwritten tickets. Ticket information such as ticket number, name, identification, etc. will be logged into the fare inspection device.
- Uses built-in camera to determine ticket validity by scanning QR codes for mobile tickets, tickets issued from a ticket vending machine, or as part of promotion

- Uses built-in camera to determine ticket validity by scanning barcodes on tickets issued from SKIDATA parking gates.
- Uses NFC-V to read ISO 15693 smartcards used by monthly parkers to determine ticket validity.

The mobile ticketing vendor shall provide the following services:

- Ongoing development support, including maintaining the mobile app and providing updates to the system as necessary, for instance as new smartphone operating systems come online
- Customer service support
- Maintaining the up-to-date app in the relevant app stores

Long-term functionality may include:

- Fare integration with Spokies bikeshare
- Integration with paratransit scheduling software to identify prepayment of scheduled ride
- Parking access to gated COTPA parking structures

## Appendix B: Ticket Vending Machine Procurement High-Level Requirements

The ticket vending solution shall provide “smaller-footprint” ticket vending machines (TVMs) that:

- Issue streetcar fare products (e.g., single trip, 2-hour pass, day pass, etc.) using paper tickets.
- Enable EMBARK to customize, introduce, or remove fare products offered.
- Print ticket validity information QR codes onto paper tickets to enable visual and optical inspection.
- Accept debit and credit cards as well as cash (bills and coins) for fare payment.
- Issue receipts for transactions either automatically or when requested.
- Meet EMV chip card technology standards.
- Use cellular service for network connectivity and debit/credit card payments.
- Use solar power with battery with an option to use electrical connection if solar power insufficient for location. The battery shall provide [REDACTED] hours of charge without solar power.
- Supply data to EMBARK on the type, number, and time of fares issued by each TVM.
- Provide maintenance report data to track reliability and ongoing maintenance issues.
- Comply with all ADA and Oklahoma state law compliance requirements including the design and accessibility guidelines. These guidelines will address the need for audio capabilities for riders with hearing impairments and enhanced tactile equipment for riders with visual impairments. Accessibility also may include developing a menu that is available in multiple languages according to the needs of EMBARK’s ridership.
- Comply with PCI-DSS standards.
- Provide timely issuance of fares with transaction time less than [REDACTED].
- Are hardened for secure cash collection.
- Can withstand exposure to the elements as they will be placed outdoors, which includes having displays that can be read in direct sunlight and a variety of other weather conditions.
- Can generate, store, and transmit alert information for relevant events such as reboots, low battery, and maintenance needs.
- Support distribution of at least [REDACTED] paper tickets between restocking.
- Accept at least [REDACTED] bills between maintenance cycles.



## Fare Schedule

December 1, 2017

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# EMBARC Fare Schedule

## Fare Structure

<u>Fare Category</u>	<u>Full Fare</u>	<u>Reduced Fare*</u>	<u>Requirements/Restrictions</u>
<b>Local**</b>			
Single Trip	\$1.75	\$0.75	
<b>Express**</b>			
Single Trip	\$3.00	\$1.50	
<b>Downtown Discovery**</b>			
Single Trip	\$0.50	\$0.25	Downtown Discovery will be altered with the introduction of Streetcar
1-Day Discovery Pass	\$1.00	\$0.50	
<b>Streetcar**</b>			
1-Hour Pass	\$1.00	\$0.50	Streetcar Passes valid only on Streetcar
1-Day Streetcar Pass	\$3.00	\$1.50	
Monthly Streetcar Pass	\$32.00	\$16.00	
<b>Universal Pass***</b>			
1-Day Universal Pass	\$4.00	\$2.00	Universal Passes valid on Local, Express, Downtown Discovery buses, and Streetcar
7-Day Universal Pass	\$14.00	\$7.00	
30-Day Universal Pass	\$50.00	\$25.00	
<b>Haul Pass</b>			
Haul Pass	N/A	\$10.00	Haul Passes available through participating schools
Haul Pass2	N/A	Free	
<b>Ferry</b>			
Ferry Single Trip Fare Per Stop	\$6.00	\$3.00	
Ferry Maximum Single Day Charge	\$15.00	\$7.50	
<b>EMBARC Plus Paratransit***</b>			
Zone 1	\$3.50	N/A	
Zone 2	\$7.00	N/A	
Zone 3	\$10.50	N/A	
Companion: Zone 1	\$3.50	N/A	
Companion: Zone 2	\$7.00	N/A	
Companion: Zone 3	\$10.50	N/A	
Personal Care Attendant	Free	N/A	
<b>Share-A-Fare</b>			
OKC Resident \$10 Book	\$6.00		Max 7 books per month per resident Includes media fee
Other Municipalities \$10 Book	\$10.50		

\* Reduced Fare is available for senior adults age 60 or older, persons on Medicare, persons with a qualifying disability, and youth ages 7-17.

\*\* Value Cards and Change Cards are accepted on EMBARK Local, Express, and Downtown Discovery bus services as well as EMBARK Plus paratransit service. These products are not accepted on Streetcar or Ferry.

\*\*\* Universal fare products are valid on all fixed route bus (Local, Express, Downtown Discovery) and Streetcar services.

\*\*\*\* Disabled individuals must be certified eligible for ADA complementary paratransit service to use EMBARK Plus. Personal care attendants (PCAs) shall not be charged a fare for EMBARK Plus service. Companions must pay the applicable zone fare. In accordance with Americans with

Disabilities Act Guidance in FTA Circular 4710.1, if a typical fixed route user would use a lower cost service (e.g., Downtown Discovery, Streetcar) from their origin to their destination, then their ADA fare would be 2 times that fare. EMBARK will determine the applicable fare by taking into consideration the mode that a typical fixed route user would use to make the particular trip, taking into consideration schedule, trip length, convenience, avoidance of transfers, etc.

## Transfers

- EMBARK does not issue transfers.
- Single Trip fare is valid only for one boarding. Additional fare payment is required for each subsequent boarding.
- 1-Hour Streetcar Pass is valid for unlimited boardings in any direction on Streetcar within the 1-hour period from the time the pass is purchased (paper) or activated (mobile ticketing). Paper 1-Hour Streetcar Passes are activated at the time they are purchased.

## Pass Restrictions

- Universal Passes are rolling period passes and expire based on activation time. For example, a 1-Day Universal Pass is valid for 24-hours from activation at the farebox or through the mobile ticketing app. Universal Passes are valid on Local, Express, Downtown Discovery, and Streetcar.
- Universal Passes are issued on magnetic stripe tickets and via mobile ticketing. Universal Passes must be activated prior to boarding Streetcar. A Universal Pass issued on a magnetic stripe ticket can be activated onboard a Local, Express, or Downtown Discovery bus. A Universal Pass issued via mobile ticketing can be activated within the app prior to boarding Streetcar or a Local, Express, or Downtown Discovery bus.
- 1-Day Streetcar Passes are calendar based passes and expire at the end of the service day. Monthly Streetcar Passes are calendar based passes and expire at the end of the service day on the last day of the calendar month. Streetcar Passes are valid only on Streetcar.
- Streetcar Passes are issued on paper stock and via mobile ticketing. A Streetcar Pass issued via mobile ticketing must be activated within the app prior to boarding Streetcar.

## Fare Payment Methods

### Local Bus, Express Bus, and Downtown Discovery

- All bus fares must be paid upon boarding and are valid for one boarding unless otherwise designated.
- Value Cards and Change Cards are accepted for fare payment onboard the bus at the farebox.
- Individuals can purchase 1-Day and 7-Day Universal Passes onboard a bus at the farebox.
- Change is issued by the farebox onto a magnetic stripe Change Card.
- Universal Passes are accepted for valid fare payment.
- Streetcar Passes are not accepted as valid fare payment.

## Streetcar

- A Streetcar Pass may be purchased and must be activated in the designated paid fare area prior to boarding Streetcar. Proof of fare payment must be carried at all times while in a fare paid area or on Streetcar and must be presented to a fare inspector upon request. Individuals without a valid fare waiting in the paid fare area or onboard the Streetcar are subject to a fare citation.
- Streetcar 1-Hour Pass is valid for one hour from the time it is purchased (paper) or activated (mobile ticketing), and allows for unlimited boardings on Streetcar in any direction during the hour.
- Change is not issued from ticket vending machines on the Streetcar platforms.
- Universal Passes are accepted for valid fare payment only if they have been activated onboard a bus prior to entering the Streetcar paid area.

## EMBARC Plus Paratransit

- All EMBARK Plus fares must be paid upon boarding and are valid for one boarding unless otherwise designated.
- Value Cards and Change Cards are accepted for fare payment at the farebox onboard the paratransit vehicle.
- Change is issued by the farebox onto magnetic stripe Change Cards.

## River Ferry

- A Single Trip or Single Day Fare must be purchased onboard the River Ferry or through the mobile ticketing app.

## Share-A-Fare

- Share-A-Fare coupon books can be used to pay for taxi fares for senior adults over the age of 60 and persons with disabilities who live in a participating area.
- Individual must be eligible and submit an application to be certified.
- Coupon books must be purchased in the city where the resident lives.
- Residents may purchase up to 7 books per month per resident.

## Fare Distribution

### Onboard Fareboxes

Individuals can pay their fare at the farebox with cash, Value Card, and/or a Change Card. Individuals can purchase Single Trip as well as 1-Day and 7-Day Universal Passes at the farebox. The farebox issues Change Cards for overpayment, with a limit of \$99.

Individuals can also pay their fare at the farebox with a pre-purchased or active Universal Pass.

### Onboard River Ferry

Individuals can pay their fare onboard the River Ferry using cash, with a credit or debit card, or through the mobile ticketing app.

## **Downtown Transit Center**

All EMBARK Bus and EMBARK Plus fare pass products and stored value cards are available at the customer service window in the Downtown Transit Center at 420 NW 5 Street.

Universal Passes may be purchased at the Downtown Transit Center using cash or with a credit or debit card.

## **Mobile Ticketing**

Individuals can purchase Universal Passes (1-Day, 7-Day, and 30-Day Passes) and Streetcar Passes (1-Hour, 1-Day, and Monthly Passes) via the mobile ticketing app. Passes must be activated prior to boarding a bus or prior to entering the Streetcar paid area.

## **Streetcar Ticket Vending Machines**

Individuals can purchase 1-Hour and 1-Day Streetcar Passes from ticket vending machines (TVMs). TVMs accept coins as well as credit and debit cards. TVMs do not issue change or Change Cards.

## **Online Website**

All Adult Full Fare EMBARK Bus and EMBARK Plus fare passes and products are available online at: <https://embarkok.com/use/buy-passes>. Online orders are subject to a \$3 handling/processing and mailing fee for orders under \$100. Orders over \$100 may be assessed higher fees.

Reduced fare passes and products are not available online.

## **Retail Locations**

EMBARK Bus and EMBARK Plus fare passes products are available at select Buy for Less locations.

## **Reduced and Free Fare Eligibility**

Reduced Fare is available on EMBARK Local and Express Bus, Downtown Discovery, Streetcar, and Ferry. Passengers riding with a Reduced Fare pass or fare product must be able to present proof of eligibility every time they ride.

## **Seniors**

Reduced Fare is available to senior adults age 60 or older with valid photo ID showing date of birth.

## **Individuals with Disabilities**

Reduced Fare is available to individuals with disabilities with a valid EMBARK Reduced Fare ID or a Medicare or VA Service Connect Card. To obtain an EMBARK Reduced Fare ID, individuals with disabilities must submit a Reduced Fare application. A licensed medical professional must complete and sign the medical verification portion of the application.

A Reduced Fare ID Card is to be used only by the person to whom it is issued and whose name appears on the card.

## **Youth**

Reduced Fare is available to middle and high school students, ages 12-17, with valid student ID or proof of current school enrollment.

Reduced Fare is available to children, ages 7-11. No proof of eligibility is required.

The 30-Day Haul Pass is available to middle and high school students who complete an application, get it validated by their school, bring it to the Transit Center, and purchase a 30-Day Universal Pass for \$10 per month. The Haul Pass is valid on all fixed route bus and streetcar services.

Haul Pass2 is available for free travel to Oklahoma City Public School high school juniors and seniors who show their school ID and swipe their Haul Pass2 magnetic stripe card. Haul Pass2 is valid on all fixed route bus and streetcar services.

Road Scholars provides free transportation for school groups (up to about 25 students and adults) on regularly scheduled fixed route bus and streetcar services. Arrangements must be made 3 weeks in advance.

## **Free Passengers**

Accompanied children that are 6 and under may ride free with a fare-paying customer.

## **Refunds and Replacements**

### **Refund Policy**

No refunds will be made for purchased passes.

### **Replacement of Damaged Fare Media**

Damaged fare media may be replaced at the discretion of EMBARK staff. Damaged fare media that are replaced are subject to a \$3.00 processing fee.

### **Lost and Stolen Fare Media**

Lost or stolen Universal and Streetcar Passes will not be replaced.

Lost or stolen Haul Pass2 ID Cards and/or Passes will be replaced, subject to a \$15.00 processing fee for each ID card or pass replaced.

Reduced Fare ID Cards will be replaced, subject to a \$15.00 processing fee.

## Group Sales

<u>Group Sales</u>	<u>Discount</u>	<u>Requirements/Restrictions</u>
Bulk	7.7%	Fare product purchases totaling \$2,000 and over
Wholesale	10%	The wholesale organization must have a formal arrangement with EMBARK to distribute fare products to the public. The organization is responsible for any payment processing fees.

Organizations are able to purchase fare products in bulk. Organizations that have a formal arrangement with EMBARK to resell fare products to the general public are able to purchase fares wholesale. These fare products include Universal Passes (1-Day, 7-Day, and 30-Day Passes) and Value Cards. Organizations must pay for fare products at time of purchase.

Streetcar calendar day, multi-day, and monthly passes will be available for purchase in bulk via the mobile ticketing app. Depending on the memorandum of understanding with the purchasing organization, the passes may be pre-sold or based on activations.

Consignment sales are not permitted. Existing arrangements with organizations for consignment sales will be discontinued as of January 1, 2019.

Organizations may purchase Reduced Fare products. Organizations are responsible for ensuring the Reduced Fare products are distributed solely to individuals who meet the Reduced Fare requirements.

## River Ferry Charters

River ferry charter service is be available for a charter fee, subject to availability:

- Private Cruise - 60 Minutes \$375.00
- Additional half hour \$150.00
- Multi-Vessel Discount \$100.00