AAATA Fare Study

Technical Memo #5: Fare Collection Process Improvement Options & Recommendations Final

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Introduction

Technical Memo #5: Fare Collection Process Improvement Options & Recommendations discusses in greater depth a number of alternatives available to TheRide regarding fare policy and fare technology, which in sum constitute TheRide's fare collection process, and based on these discussions make final recommendations to the agency at the end of the technical memo. The options explored in this document have been categorized into the following topic areas:

- Transfers
- Change Cards
- Tokens
- 30-Day Pass
- 1-Day Pass
- Rider Category Discounts
- Fare Increases
- Service Types
- Fare Technologies
- Fare Enforcement
- Third Party Pass Programs

The specific options explored in this document were selected for more in-depth analysis by TheRide staff following a number of in-person workshops where the feasibility and appropriateness of a broader range of options were discussed. During the workshops, TheRide stakeholders evaluated the broader set of options against four primary goals set by agency staff:

1. Attractive
2. Consistent
3. Convenient
4. Fair

These four goals are referenced as standards by which to assess the options available to TheRide throughout the document.

It is important to recognize that decisions related to one aspect of fares may affect the details of or even the possibility of choosing certain alternatives for other aspects. These tradeoffs are highlighted within this document to provide transparency to TheRide staff.

Part I of this document reviews the fare collection process improvement options that are under review. These options were selected based on the Options Workshops conducted with TheRide staff on May 10th and May 11th, 2018. To further assist in the evaluation of alternatives, Four Nines modeled a number of the options. Three versions of the Four Nines model were built for this purpose: Baseline, Alternative 1, and Alternative 2. Since each of the Alternatives included two iterations, five separate model files will be delivered to TheRide upon completion of the fare study.

The Baseline model reflects the status quo, which in each of the fare structure option categories below

has been expressed as the first option. The other option descriptions specify which model alternative they are built into. Note that not every fare structure option category, or even every option within those categories, is modeled. The table below provides a quick guide as to which ideas are modeled and, if so, which model version they are included in:

Idea	Alternative 1: Iteration 1	Alternative 1: Iteration 2	Alternative 2: Iteration 1	Alternative 2: Iteration 2	Not Modeled
Eliminate transfers for public	✓	✓	✓	✓	
Introduce 2-hour magstripe pass	✓	✓			
Introduce electronic 2-hour pass			✓	✓	
2-hour pass as base fare					✓
Eliminate change cards					✓
Tokens only available to social service agencies	✓	✓	✓	✓	
Lower fixed route 30-Day Pass pricing multiple		✓		✓	
Enable fare capping			✓	✓	
Eliminate 1-Day Pass	✓	✓	✓	✓	
Maintain current rider category discounts, but expand them across all services			✓	✓	
Align rider category discounts with base federal standards	✓	✓			
Discontinue discounts for individuals 60-64			✓	✓	
Establish a fare increase policy					✓
Establish all services' fares using a multiple of the fixed route base fare		✓		✓	
Introduce electronic fare option			✓*	✓*	✓*
Shift enforcement offboard					✓
Do not incorporate rider category discounts into third party pass program pricing		✓		✓	

*Only a 2-hour electronic pass and an electronic, capped monthly pass are modeled. The introduction of smart cards and/or mobile ticketing throughout the system is not modeled.

Part II of this document discusses the results of the modeling. The technical memo concludes with

overall recommendations for TheRide in Part III.

Part I: Fare Structure Options

Transfers

Transfers allow riders to use different transit routes and services to complete a trip, providing more seamless travel. They also make fares more affordable to riders who must transfer to another route, service, or agency during their trip by providing a credit for the fare paid on the initial boarding and charging less than the full fare on the second boarding.

According to GFI farebox data provided by TheRide, on local fixed route there are 1.45 boardings per linked trip. Assuming that most people only transfer once during a trip, this equates to approximately 55% of riders who do not transfer during their trip and 45% of riders who do transfer during their trip.

The same dataset was used to calculate boardings per linked trip for ExpressRide. This rate is much lower at 1.03. Again assuming that people who transfer do so only once, this equates to approximately 97% of riders not transferring and 3% of riders transferring during a single trip.

Option 1: Maintain existing transfer policy

TheRide currently offers free transfers that are valid for 90 minutes to complete a one-way trip.

The main strength of maintaining the existing transfer policy is that it does not require explaining any changes in the transfer policy to the public. However, the current transfer window is not long enough for some riders to complete their one-way trip, particularly for those traveling from one end of the service area to the other during off-peak hours. Transfers are also printed onboard using the TRiM unit; this creates more wear-and-tear on the units and may result in more maintenance calls as well as farebox maintenance costs. Riders also regularly experience difficulty in getting the TRiM unit on their second vehicle to read the transfer printed onboard their first vehicle. This is especially true in cases where the transfer becomes wet, such as in rainy or snowy conditions. These weather conditions alone tend to reduce on-time performance. When combined with the transfer acceptance issues they induce and the resulting boarding time delays, TheRide's service time performance can be greatly impeded.

Option 2: Transition from one-way transfers to time pass

Shifting from one-way transfers to a time pass (e.g. 2 hours) would reduce the wear-and-tear on TRiM units and remove the issue of transfers not being read by the farebox on successive vehicles. Time passes are also simpler to explain and remove the restriction on riders completing a roundtrip if they can complete it within the time window.

A longer, timed pass may also be a more equitable option for Ann Arbor. Because of the way property values are distributed across TheRide's service area compared to where employment opportunities are located, the passengers making longer trips usually earn a lower income than passengers making shorter trips. Thus, a longer pass window may reduce the number of times these lower income riders are required to pay the base fare.

There are two options for how to introduce a time pass and shift away from one-way transfers: (A) by adding a time pass as an additional product separate from the one-ride base fare or (B) by making the time pass the base fare. Either of these alternatives could impact the pricing of third party pass programs; it will be important to consider how the introduction of a time pass may affect third parties' perception of what fair contract pricing would be.

A: Single ride is still available

In the case where a single ride is still available, passengers would not automatically be issued a time pass upon boarding. Similar to current practices where some riders request a transfer and some do not, riders would need to request a time pass specifically so that operators could collect the up-charge and issue the time pass. Passengers wishing to purchase a single-ride ticket would simply pay their base fare and ride, just as they do today. This way, passengers that do not need to transfer to another vehicle are not paying for a service they do not need. Both single-ride tickets and time passes would be issued on magstripe fare media. Depending on TheRide's decisions regarding fare payment technology, either or both of these fares could also be available on new fare media to riders.

This is modeled in Alternative 1 of the fare model with the separate time pass as valid for two hours and available on a magstripe.

B: Time pass is base fare

Alternatively, a time pass could be introduced as the base fare. In this case, all passengers automatically receive a two hour time pass upon paying their base fare. In essence, passengers would be paying for access to TheRide's fixed-route, non-express system when they board the bus for a certain period of time instead of for a single trip. This removes the need for an operator to determine which passengers do or do not need to be issued a pass versus a single-ride ticket upon boarding.

This option is not modeled since only two versions of the model are being constructed for this project, with model Alternative 1 being built to reflect the option above and model Alternative 2 being built to reflect the option below. TheRide could, however, easily change the specification of model Alternative 1 on their own in the future to reflect this option and see the effects on ridership and revenue.

Option 3: Restrict transfers to electronic media

If TheRide chooses to implement an electronic fare collection system in the future (e.g. a smart card system and/or mobile ticketing), there may be opportunities to restrict transfers only to those riders using electronic media. Electronic transfers are easier to manage than paper transfers - the backend system keeps track of the transfer window and what routes the transfer may be used on and then accepts or rejects a presented transfer accordingly. The backend can also automatically process any up-charges or charge a rider for a new trip. This ease in management provides agencies with a greater ability to enact more intricate transfer policies. Electronic transfers also provide better data on transfer use that can be used for planning purposes within the agency.

This option requires the necessary technology to implement, meaning TheRide would have to move forward with mobile ticketing and/or smart card technology for it to be feasible. Additionally, TheRide

should consider what effect restricting transfers to electronic media may have on riders who cannot easily access the electronic media. Potential equity considerations would need to be evaluated for this option to determine whether this change would result in a disparate impact to minority or low-income riders.

Option 4: Enable formal transfers between FlexRide and Fixed Route service

Currently, there is no policy to enable FlexRide customers to transfer to TheRide's fixed route services. Instead, they must pay separately for each service at full price. In the event that TheRide wishes to maintain or expand this service, the agency may want to explore options for formal transfers between FlexRide and fixed route in terms of both policy and technology.

For policy, TheRide must determine FlexRide's exact relationship to fixed route:

- If FlexRide is considered a feeder service, TheRide may want to price the service below fixed route. As a feeder service, transfers to fixed route would likely require an upcharge.
- If FlexRide is considered an extension of fixed route service, it may make more sense for the agency to charge the same fare as on local buses. In this case, the simplest way to handle transfers between the two services would be to match the policy in place for transfering between local buses, provided the necessary technology improvements can be made.
- If FlexRide is considered a premium service, it may be priced above the fixed route fare. TheRide would then want to enact an upcharge for transferring from fixed route to FlexRide.

The policy for FlexRide as it relates to fixed route is also inherently influenced by TheRide's decisions on the options detailed above concerning the base fare and transfer policies for fixed route. Whether TheRide chooses to maintain transfers and whether TheRide chooses to move from a single-ride base fare to a time pass will impact the feasibility of each of the relationships detailed above. For instance, if TheRide chooses to move to a time pass, the easiest option would be to price FlexRide the same as fixed route and then make the pass valid on both services. TheRide could instead choose to retain single-ride pricing on FlexRide, but this would complicate the system for riders, potentially affecting the goals of consistency and convenience established by TheRide. However, TheRide may determine that the goals of attractiveness and/or fairness necessitate a different pricing and transfer structure for FlexRide. It is up to TheRide to weigh these considerations and make a final decision, though recommendations will be provided to the agency based on the analyses detailed in Part 2 of this document.

The technology used to enable transfers between FlexRide and fixed route could take a number of forms, depending on TheRide's willingness to invest in infrastructure. One option is for FlexRide operators to print out simple receipts for their riders with a time and date of issuance, which would require the operators to be equipped with a portable receipt printer. These receipts could then be shown to Fixed Route operators as a form of visual validation upon boarding. Another option is for receipts to include a form of media that can be electronically validated. This could be barcodes, magnetic stripes, or smart media. Any electronically validated fare media would need to be both issued and validated on the FlexRide vehicles. For issuance, the fare media could be pre-encoded and distributed to the drivers, the driver could have a handheld device capable of issuing the media, or an issuing device could be installed on the FlexRide vehicles. For acceptance, a reader would be required.

This could be a portable device carried by the driver or an installed reader on the vehicle. On fixed route vehicles the media used for transfers would be validated by existing readers. In the case of magstripe, this would be the existing GenFare magstripe readers. Barcodes could be used if a new mobile ticketing system required barcodes on fixed route buses, and smart media could be used if TheRide adopted a smart card system.

Handheld readers for the drivers would likely be based on a smartphone platform which can support barcodes, magstripes, and smart cards. Installed readers would likely be similar to what is installed on fixed route. Barcodes and magstripes could be validated without internet connectivity to the readers, but connectivity would improve data and reduce fraud potential. Smart card readers would require real time communications and thus an internet connection.

Change Cards

The onboard TRiM unit issues a change card to any customer who inserts more cash into the farebox than is required for their ride. A rider can then dip the change card into the TRiM unit upon subsequent boardings as a form of payment. In FY 2017, TheRide issued 321,951 change cards which were used in aggregate 381,224 times. This comes out to an average usage rate of 1.19. Based upon conversations with TheRide staff and in particular bus operators, there is reason to believe that a number of riders use change cards even more often than this; riders turn change cards into a form of stored value card by loading the maximum $10 into the farebox and then using the change card throughout the week until all the value is gone. As discussed in earlier memos, this presents challenges with the TRiM units since change cards are not meant for extended use and as such the fare media tends to malfunction after a time. Additionally, the issuance of change cards causes wear-and-tear on the TRiM units.

Note that the change card options discussed below will not be modeled because of limited data availability and their role in the overall fare structure at TheRide. Without extensive data on the use and amount of value placed on change cards, the model's ability to predict riders' change in behavior related to each of the options below is limited. Additionally, change cards are a convenience and thus do not have a direct impact on the established base fare.

Option 1: Maintain change cards

Customers appreciate the change cards since they feel that getting their change back if they overpay is fair. Additionally, some customers use change cards to create their own mid-length passes by paying $10 upon boarding and putting the rest on a change card, thus fulfilling a need that TheRide's current fare media options do not.

However, issuance and use of change cards negatively impacts both operations and maintenance. Change cards are known for getting stuck in TRiM units and for being hard for the TRiM unit to read. These issues result in boarding delays and impact on-time performance. They also at times force operators to call the maintenance division and request travel out bus repair calls. TRiM units, according to the maintenance department, are by far the most frequent reason for these service calls out to buses, and sometimes replacement TRiM units must be carried out to the bus and a switch-out performed on

site. The TRiM unit maintenance issues results in costs to TheRide in a number of forms, including lost fare revenue while the farebox is inoperable and passengers are boarding, opportunity costs in the form of maintenance workers having to take time out of their day to travel to the vehicle, and direct costs in the form of maintenance on and replacement of TRiM units.

Option 2: Eliminate change cards

Eliminating change cards will help to prolong the life of the TRiM units, reducing maintenance costs and service calls. Elimination may also remove a source of boarding delays and could reduce rider/operator conflict over change cards.

However, riders may oppose having to carry exact change and being forced into overpaying when they do not have exact change. At the current $1.50 fare, the risk of not having exact change is lower than if TheRide chose to increase their fare to a less standard figure, such as $1.60. Thus, if TheRide does choose to eliminate change cards, TheRide should carefully consider the magnitude of its fare increases and the resulting base fare price.

A way to lessen the burden of removing change cards is to encourage as wide an adoption as possible of new fare payment technologies, if TheRide decides to move forward with mobile ticketing and/or smart cards. Expanding access to these electronic forms of payment for current cash riders would eliminate the concern of overpayment for service and the need to carry exact change.

Tokens

Tokens can be inserted into onboard fareboxes as payment for single rides. In FY 2017, TheRide collected 124,729 tokens onboard: 56,532 small tokens and 68,197 large tokens. These tokens are primarily distributed through TheRide's personal retail outlets, such as the Blake Transit Center and AAATA headquarters, Bank of Ann Arbor local branches, and contracts with social service agencies and nonprofits. When received, tokens are counted and repackaged by TheRide staff before being sold once again through these sales channels. Thus, they are a circulating form of fare media provided they are not lost by purchasing customers.

Option 1: Maintain existing token policy

TheRide currently sells tokens to both the general public and social service agencies and nonprofits. Under this option, tokens would continue to be available through all current channels. The benefit of this option is that it would not change the availability of fare media options for any customers; tokens would remain a convenient way for the general public to pre-pay for their trips and thus board more easily.

This pre-pay option may be less necessary, though, depending on TheRide's decisions regarding electronic fare payment technologies, since mobile ticketing and/or smart cards would also provide convenient pre-pay options to customers.

Option 2: Tokens only for social services agencies, eliminate tokens for public purchase

TheRide could choose to limit tokens sales to only social service agencies and nonprofits, thereby eliminating tokens as a fare medium for general public purchase and simplifying TheRide's fare structure. A benefit of this policy is the likely reduction in intake of tokens. Since TheRide staff currently count and repackage tokens, this option could reduce the number of hours staff must spend on these tasks. Elimination of tokens could also incentivize customers to migrate to electronic fare payment options as their form of pre-paying for rides if new fare payment technologies are pursued by TheRide.

This option does not suggest eliminating tokens entirely because of the convenience they afford to TheRide and the agency's social service partners. Tokens are a reliable, simple way of fulfilling social service agencies' need for a fare payment media to distribute to its patrons; tokens do not need to be activated and are easy to track and distribute. Tokens remain the most logical fare medium for social service agencies even if TheRide decides to pursue mobile ticketing and/or smart cards. Other agencies who have eliminated tokens have struggled to find as straightforward a fare medium for supplying social service agencies. Some agencies have resorted to distributing costly limited-use smart cards that then must be loaded with value either by the transit agency or the social service agency. These limited-use smart cards would represent a financial and administrative burden to all involved, and are not recommended above tokens.

This token option is modeled in both Alternatives 1 and 2 of the fare model.

30-Day Pass

TheRide offers unique 30-Day Passes to different segments of its ridership, all of which are rolling passes. These passes include a FlexPass for the general public, Value Passes for each of the four half-fare discount rider categories (youth, low-income, non-ADA disability, and seniors 60-64), and an EMU pass for Eastern Michigan University affiliates. Currently, the FlexPass and Value Passes are priced at 38.7 times the base fare for each of these rider groups. Thus, the FlexPass costs $58, and the Value Passes cost $29. EMU passes are unique in that TheRide sells them to EMU at the 10% bulk discount rate, and the University then sells them at an additional 20% discount, or $40.60, to eligible affiliates.

Usage rates for the current 30-Day Pass products are as follows, according to data from November 2017 to March 2018 provided by TheRide:

Pass Product	Usage Rate (number of uses per pass)
FlexPass	47.07
Value Pass Income Eligible	56.79
Value Pass Senior 60-64	64.29
Value Pass non-ADA Disability	72.1

Value Pass K-12 Student	34.25
EMU	40.55

Option 1: Maintain current 30-Day pass pricing

TheRide's magstripe 30-Day Passes are designed for rider convenience and to give frequent riders a discount, with 20 round trips equating to a rider earning back their investment in the pass. Thus, this fare product is ideally suited for commuters and other individuals who use the service regularly. 30-Day Pass use also benefits TheRide by minimizing cash intake at the farebox, which can reduce the costs of cash processing and lowers the number of change cards and transfers issued by the farebox. 30-Day Pass use thus reduces farebox maintenance costs while also speeding boarding times since magstripes allow faster boarding than onboard cash payments. The current 30-Day Pass pricing does incentivize some riders to use the pass, with 11% of riders currently using it to pay their fare.

Option 2: Explore various multiples with goal of incentivizing purchase and use

There is, however, room for growth in 30-Day Pass usage. According to TheRide's 2017 onboard survey, of those customers who use TheRide six or seven days a week (and thus would easily break even on a 30-Day Pass), only 11% use a 30-Day Pass compared to 29% who use cash.

Higher pass usage, which could be incentivized by lowering the 30-Day Pass multiple, would benefit both TheRide and its customers. TheRide would receive the finance and operations benefits mentioned above, except on a greater order of magnitude than under current 30-Day Pass usage. Customers who are currently eligible for the discount built into a 30-Day Pass based on their ridership levels but cannot pay the upfront cost could possibly afford a 30-Day Pass if the pricing multiple is lowered. There is also some hope that lowering the price of a 30-Day Pass would encourage more riders who border on frequent use to purchase the pass upfront. Once purchased, a 30-Day Pass represents a sunk cost. Thus, if an individual owns a 30-Day Pass and is choosing how to travel to a destination, they may choose transit over other modes if they have already paid for their trip in the form of a 30-Day Pass.

A new multiple is explored in Alternative 1 of the model.

Option 3: Enable fare capping

Fare capping is a new pricing strategy used by some public transit agencies where riders "cap out" at the price of a pass. If implemented within TheRide's current fare structure, riders would pay per boarding for each of their trips until they reach their 40th ride (because of the 38.7 multiple), at which point that ride and each subsequent ride would be free for the rest of the pass time period.

This pricing strategy would require implementation of smart card technology. While fare capping is theoretically possible on a mobile ticketing platform, the coding necessary to enable fare capping would greatly increase the costs of purchasing and operating a mobile ticketing platform.

If TheRide decides to pursue fare capping, the agency should strongly consider changing their rolling 30-

Day Pass to calendar-based monthly passes. This would simplify both the back-end structure necessary to implement the policy and also the agency's communication of fare capping policy to riders.

One of the primary motivations behind fare capping is equity. Under fare capping, the cash riders mentioned above who are reaching the 30-Day Pass breakeven ridership threshold but who cannot currently afford the fare product would receive the frequent rider discount embedded in a 30-Day Pass. In order to enable these equity benefits, however, an agency must ensure access to the electronic, account-based fare payment technology in use, even for those riders without banking services. There are new companies such as PayNearMe that provide individuals with retail locations where they can load cash to an account, including a transit account. While these companies help expand access to electronic fare payment technologies, their services come at a cost to the agency that is usually taken as a percentage of the value loaded by riders into their accounts. The retail network these companies rely upon also has to be extensive enough to cover the vast majority of potential riders in order for the equity goals of fare capping to truly be realized.

A second motivation behind implementing fare capping is positive marketing for the agency. Fare capping is often marketed as a "best fare guarantee" to enhance public perception of service and potentially increase ridership. Fare capping is still too new of a strategy, however, to point to any definitive results in increasing ridership.

Fare capping will always result in a decrease in revenue. If fare capping is implemented, TheRide will lose the most revenue from riders who currently purchase a 30-Day Pass even though they do not reach the breakeven ridership threshold. Essentially, these riders are paying for more service than they actually consume, possibly because they enjoy the convenience of a 30-Day Pass or have another institution or person who purchases the pass for them. The table below presents estimated percentage changes in revenue by 30-Day Pass product from this specific source of lost revenue if fare capping were to be implemented with current pricing and ridership trends:

Pass Product	% Change in Revenue
FlexPass	-18.9%
Value Pass Income Eligible	-17.5%
Value Pass Senior 60-64	-11.0%
Value Pass non-ADA Disability	-8.4%
Value Pass K-12 Student	-34.2%

EMU 30-Day Passes were excluded from this table because they represent a unique situation compared to the other 30-Day Pass products offered by TheRide. The agency will need to consider how fare capping would affect EMU 30-Day Passes specifically because of their place within TheRide's fare structure.

The second driver of revenue loss under fare capping comes from riders who used to pay more than the

value of a 30-Day Pass in cash rides each month, but who are now able to reach the capping threshold. Due to data limitations, this revenue loss cannot be estimated for TheRide in particular. Based on the experiences of other agencies in the transit industry, it is safe to estimate that TheRide would expect to lose approximately 2% of current fare revenues from this shift in fare product use.

It is worth noting that the implementation of fare capping, similar to the transition from single ride fares to time passes, may cause third party payers to rethink their contract amounts. TheRide must carefully consider the likelihood of this possibility since third party programs contribute to a substantial portion of the agency's revenue.

Fare capping is modeled in Alternative 2.

1-Day Pass

1-Day passes are sold onboard fixed route vehicles, at the AAATA main office, and through TheRide's website. The passes are valid for unlimited rides until 11:59 pm on the day they are purchased and are priced at $4.50, or 3 times the single-ride fare.

According to GFI ridership data provided by TheRide, only 1,206 1-Day Passes were issued in FY2017. 1-Day Passes thus account for less than 0.2% of boardings.

Option 1: Maintain 1-Day Pass

Some riders do use the 1-Day Pass, and it is the only "intermediate" pass option since it lies between single-ride tickets and 30-Day Passes.

Option 2: Eliminate 1-Day Pass

1-Day Passes purchased onboard fixed route vehicles are issued using the TRiM unit. This causes additional wear-and-tear on units that are already experiencing regular maintenance issues, according to conversations with TheRide staff. Loading the money necessary to purchase a 1-Day Pass into the farebox also slows boarding times and impacts on-time performance. Eliminating 1-Day Passes would reduce these negative boarding and maintenance impacts. Since these passes are used for so few boardings, there would likely be little pushback from riders if TheRide chose to eliminate this fare product.

The elimination of 1-Day Passes is modeled in Alternatives 1 and 2.

Rider Category Discounts

TheRide offers discounts to a variety of rider segments, far beyond what is required by federal law. These categories include:

- Individuals with an ADA disability
- Seniors ages 65 and older
- Income eligible individuals
- Individuals with a Non-ADA disability

- Seniors ages 60-64
- Students

The discount available to each of these rider segments differs, but there is some natural grouping of segments that arises. Individuals with an ADA disability and seniors ages 65 or older typically receive the same level of discount, thus forming what will be called Group 1. The rest of the segments listed above - income eligible, non-ADA disability, seniors 60-64, and students - will be called Group 2 since they all tend to receive the same level of discount, which is different from the level of discount for Group 1.

Option 1: Maintain current rider category discounts

Currently, discounts vary not only by rider category, but also by service. On fixed route, Group 1 discount riders are eligible to ride for free while Group 2 riders receive a 50% discount on single-ride fares and 30-Day Passes. On GroceryRide and ExpressRide, no discounts are given to either group. On NightRide/HolidayRide, Group 1 receives a 40% discount on fares, while Group 2 receives no discount.

TheRide staff have expressed the difficulty of explaining these discounts to eligible individuals, which may impact the attractiveness of TheRide's services, a stated goal of the agency. The current policy also does not align well with TheRide's stated goal of consistency. However, those riders that do receive discounts currently enjoy those discounts and seem to make good use of them on each of the TheRide's services.

Option 2: Establish consistent discounts on all services

One proposal is to establish consistent discounts across fixed route, GroceryRide, and NightRide/HolidayRide. This would make it easier for TheRide staff to communicate the agency's discount structure to eligible riders. It would also help maintain a consistency across services that is currently lacking.

Considering the special funding structure behind ExpressRide and the limited segment of riders who transfer between ExpressRide and local fixed route, it is in TheRide's best interest to maintain the no discount policy for ExpressRide fares. Thus, this option does not include ExpressRide in establishing consistency.

A: Adopt federal minimum standards

To create consistency, TheRide could choose to eliminate all Group 2 discounts and to only offer Group 1 a 50% discount on fares across its services. This alternative technically still goes beyond legal requirements since federal standards state that the 50% discounts for ADA-eligible individuals and seniors 65 and older only have to be in place during off-peak hours and are not required on premium services, which GroceryRide and NightRide/HolidayRide could be considered as. If adopted, this alternative would also impact third party contracts that attempt to incorporate the number of discount riders into the contract pricing. Potential equity concerns would need to be evaluated for this option to determine whether this change would result in a disparate impact to minority or low-income riders.

This is modeled in Alternative 1 of the fare model.

B: Maintain current fixed route discount structure and replicate that on GroceryRide and NightRide/HolidayRide

Another option to create greater consistency among rider discounts would be to expand the current fixed route discount structure across each of TheRide's services. This would mean that Group 1 individuals could ride for free not only on fixed route, but also on GroceryRide and NightRide/HolidayRide. Group 2 individuals would receive a 50% discount on each of these services.

This is modeled in Alternative 2 of the fare model.

Option 3: Discontinue discount fares for individuals 60-64 on fixed route

It is not standard industry practice to offer seniors ages 60 to 64 a discount on services. This is a small portion of ridership to offer a discount to (approximately 1% of riders), and the additional discount category creates greater complexity while requiring TheRide to invest financial and human resources in processing another unique fare media and fare discount ID card type. Also, as more individuals choose to work later in life, asking seniors ages 60 to 64 to pay full fare represents less of a financial burden than in the past. Potential equity concerns would need to be evaluated for this option to determine whether it would result in a disparate impact to minority or low-income riders.

The elimination of the senior ages 60 to 64 discount category is modeled in Alternative 2 of the model, in combination with Option 2B above.

Fare Increase Policy

Currently, TheRide does not have any formal policy to guide fare increases. It is industry best practice for a transit agency to create a fare increase policy that contains guiding principles the agency can use to determine when a fare increase is needed. A fare increase policy also creates an avenue for explaining the justification for fare increases to stakeholders by demonstrating the reasoning and methodology behind fare increases - such as rising labor costs, increased capital costs, etc. - leading to more understanding and less pushback when the need for a fare increase arises.

Ideally a fare increase policy details not only when a fare increase review should begin, but also exactly how that review should be conducted and what key decision points will affect the final fare increase recommendation. A policy such as this provides a clear roadmap for the agency in a process that can at times be controversial and political.

Note that the fare increase options will not be modeled, but TheRide can choose to test various fare increases in the Four Nines fare model once the tool has been turned over to the agency. As with any fare increase, it would be necessary to conduct a Fare Equity Analysis per federal civil rights guidance to determine if the proposed fare increase would result in a disparate impact to minority riders or a disproportionate burden to low-income riders.

Option 1: Maintain current fare increase policy

The current fare increase policy is that there is no policy. Due in part to this lack of guidance, the last

fare increase occurred over five years ago, and no evaluation of the need for a fare increase has been performed since. During this last fare increase, not all services were considered either. While the cost of fixed route service increased, NightRide/HolidayRide remained at the same price, and there is little evidence that this decision to leave fares at their previous level was carefully analyzed. While the lack of a fare increase policy provides a certain sense of flexibility for TheRide, it also means the agency lacks structure and guidance. Without any structure or guidance, fare increases will always come as a surprise and thus receive greater pushback from stakeholders, especially riders.

Option 2: Establish a set period of time between fare increases

Establishing a set period of time between fare increases has a number of advantages. This type of policy provides strict regularity for all stakeholders: the agency itself, the Board, riders, etc. Barring unusual circumstances, this type of fare increase policy is proactive instead of reactive. The agency can forecast their financial needs and adjust fares accordingly each time a fare increase arises. This also allows the agency to appropriately plan for fare increases, which may include marketing campaigns or other fare-related activities in advance of implementation.

One detail that must be considered is how large these fare increases would ideally be. The magnitude of the increases would likely be correlated with how often the fare increases occur (i.e. less time between increases means smaller increases while more time between increases means larger increases). If the fare increases are smaller, the agency must evaluate the effect this would have on cash riders in terms of the change they must carry, especially if change cards are eliminated.

For a regular fare increase policy to confer the above benefits to an agency, the agency must be willing to follow through with the planned fare increases. Delaying or opting out of the fare increases will eliminate the sense of expectation that generates stakeholder buy-in and decrease the effectiveness of this fare increase policy.

Option 3: Evaluate need for fare increase along with regular budget review

Coinciding fare increases with regular budget reviews creates structure for a transit agency and confers the added benefit of evaluating fares within the context of the agency's overall financial health. Because the fare increases would occur within this broader context, they would be given an extra sense of legitimacy over the current ad hoc method of fare increases. To maintain this legitimacy, the agency would need to effectively communicate to both the Board and riders the methodology used to decide on fare increases each time a regular budget review is conducted. Otherwise, similar to the caution detailed in the option above, the agency might face greater pushback once staff do decide that a fare increase is necessary.

Option 4: Establish internal indicator(s) that will be used to determine when a fare increase should happen

This fare increase policy option provides the greatest level of flexibility by enabling TheRide to establish indicators that determine fare increases instead of establishing a set timeline for increases. TheRide would collaboratively decide as an agency what situations necessitate a fare increase, providing in the

end a set of highly contextualized indicators based on these discussions. Once an indicator (or a number of indicators depending on the details of the policy) reaches a certain threshold, a fare increase review would be triggered. The process of determining indicators and their thresholds alone could help agency staff develop a better understanding of agency priorities around finances and fares.

While internal indicators do not confer the same benefits as setting strict timelines for fare increase reviews, fare increases under this type of policy can still be strongly defended if the indicators and evaluation methodology are documented and communicated well to all stakeholders.

Service Types

TheRide offers a variety of service types to its riders, including:

- Fixed route*
- ExpressRide*
- GroceryRide*
- NightRide/HolidayRide*
- FlexRide
- ARide
- GoldRide
- AirRide
- FootballRide
- ArtRide
- VanRide

The services marked with an asterisk are the services included within the scope of this particular study and thus within the fare model.

Currently, there is no commonality in the pricing of these services. Instead when a service debuts, pricing for that service is set independently of any established policy. At times this results in a seemingly ad hoc umbrella of services and fares with unclear relationships between the individual services.

Option 1: No change

Current service pricing is done on an individualistic basis with only a general regard for the pricing of other services. There is no clear relationship between service pricing for riders, which may cloud their understanding of how the various services interact with one another. However, setting service fares individually does allow for increased freedoms in pricing that can take into account the specific revenue sources that pay for operation of the service. For instance, ExpressRide is very clearly priced to account for operation of the service beyond TheRide's standard service area since Chelsea and Canton do not participate in a funding millage for TheRide. Instead, their governments pay a specific contract amount to TheRide annually to enable the service to operate. This absence of millage funding means fares must cover a higher percentage of ExpressRide's operating costs, and fares for the service are set accordingly.

Option 2: Establish all services' fares using a multiple of the base adult fixed route fare

To foster greater rider comprehension of services and establish a guiding policy for service fares, TheRide could choose to price each of its services at a multiple of the base adult fixed route fare. Under this type of policy, it is clear which services are considered "premium" services since they would be priced above fixed route. Multiples pricing could also better facilitate transfers between services, since any upcharge would simply be a multiple of the base fare. Fare increases are then also easily distributed among the services since an increase in the base fare would trickle through to each of the multiples. Multiples pricing could also provide a pricing schema for the establishment of fares for new services instead of setting these fares using more arbitrary methods.

Setting a fare multiple policy among services does create a certain rigidity to pricing, however. TheRide will have to decide if the increased comprehension of service fare multiple pricing outweighs the decrease in pricing flexibility. Because this option may result in a shifting of fare prices between service categories, it would be necessary to evaluate the changes to determine whether it would result in disparate impacts to minority or low-income riders.

This option is modeled in the second iteration of model Alternatives 1 and 2.

Fare Technologies

Fare payment technology within transit is evolving rapidly. Many transit agencies have chosen to deploy mobile ticketing technology, smart card technology, or a combination of the two. All three of these options are detailed below. Note that none of the fare technology options will be modeled specifically. Instead, the model contains a general "electronic fare payment" fare media distinction that encompasses whichever option is selected here.

Option 1: No change

Customers - not just riders, but also third party program partners - are accustomed to the existing fare collection system. While it has its limitations, it is capable to providing for TheRide's current fare collection needs. Any change to the fare collection system would require significant public education and a financial investment by TheRide.

As discussed below though, a smart card and/or mobile ticketing system provides opportunities to reduce operating costs, simplify fare collection, attract new markets, improve data collection, improve administration of third party programs, and can facilitate the introduction of new products and programs.

Option 2: Smart card

Smart card systems rely on a reusable card that stores passes and stored value for future use. Customers tap their card on a card reader, rather than dipping or swiping a pass. Smart card systems provide incredibly rich data for agencies to use in planning, can ease the administration of third party programs

and other operations, and can enable agencies to introduce new products and programs such as more complicated transfer policies. Smart card systems also provide an opportunity to shift the burden of fare enforcement from onboard to offboard, removing a major source of operator-customer conflict.

Smart card systems require a large, up-front investment and are not cost effective for agencies of all sizes. While a few years ago smart card systems involved a minimum investment well above a million dollars, there are now a few vendors on the market who will offer Software as a Service smart card solutions that involve capital expenditures that are 10% or so of those costs. Smart cards are less expensive to operate and maintain than magstripe and cash systems because they are entirely solid state. Potential equity considerations would need to be evaluated for this option to determine whether it would result in a disparate impact to minority or low-income riders especially if specific fare media were to be available only on smart cards.

Option 3: Mobile ticketing

Mobile ticketing gives customers the ability to use an app on their smartphone or tablet to pay for transit. This technology can attract new markets, eliminate the need for customers to carry cash or pre-purchase passes, while providing better data for the agency, and can reduce operating costs due to lower usage of other fare media. Mobile ticketing has lower capital costs than smart cards and some financial models include no upfront costs.

While good retail options are becoming available for paying cash, mobile ticketing still generally requires customers to complete their purchase using a credit or debit (including prepaid debit) card, which can limit access to the technology for unbanked and underbanked customers. Additionally, users must have a smartphone or tablet with a sufficient data plan and/or wi-fi access to purchase and activate their pass. Potential equity considerations would need to be evaluated for mobile ticketing to determine whether it would result in a disparate impact to minority or low-income riders, especially if certain fare products were only available through mobile ticketing.

Option 4: Smart card + mobile ticketing

An integrated smart card and mobile ticketing system provides all the benefits of a stand alone smart card or mobile ticketing system but with a seamless user experience for customers to switch between media types. Offering customers both options also provides the opportunity for a wider group of customers the access the benefits of not having to carry cash, lost/theft protection for passes, etc. than would be able to access one technology or the other.

An integrated smart card and mobile ticketing system would require a significant financial investment by TheRide, above that of either system individually, and potentially greater than the cost of two independent systems together. This is because fewer vendors offer an integrated solution and the integration of separate solutions would require design, development and testing efforts.

Fare Enforcement

TheRide currently offers six different types of discount and free fares to pre-approved customers. The

table below displays the percentage of riders using each type of reduced fare according to TheRide's 2017 onboard survey:

Rider Discount Category	% Ridership
Individuals with an ADA disability	3%
Seniors ages 65 and older	3%
Income eligible individuals	5%
Individuals with a Non-ADA disability	5%
Seniors ages 60-64	1%
K-12 Students	Between 1% and 3%*

*This was the best data available from the 2017 onboard survey regarding student discount users as a percentage of total ridership

Customers who use a discount fare media constitute about 20% of fixed route ridership. The two largest categories of users are Fare Deal income eligible riders and Fare Deal non-ADA disability riders. The smallest category of users are seniors ages 60-64. In total, the discount fare categories not mandated by federal standards make up a larger percentage of TheRide's ridership than those categories that are mandated by the federal government (i.e. individuals with an ADA disability and seniors ages 65 and older).

Currently, customers eligible for discounted or free rides are pre-approved by submitting appropriate documentation to TheRide staff. Customers who complete this application process then receive a discount fare ID including the following information: name, photo, expiration date, and type of discount. A discount rider, according to policy, is supposed to demonstrate their eligibility for a free or discounted fare by showing the appropriate ID to the driver upon boarding. Each type of discount fare ID is branded differently to help bus operators distinguish visually between the various types of ID cards and confirm the riders' eligibility. There is no electronic or automated form of discount eligibility.

The fare enforcement options will not be modeled.

Option 1: No change

The current policy requiring a rider to show their discount fare ID to the driver is not uniformly enforced. Some drivers require that they see an ID every boarding, as dictated by policy, whereas others may come to recognize frequent riders and stop asking to see the ID. While regular riders likely enjoy not having to show their ID each boarding, the inconsistency can create confusion and even irritation among other riders who feel they are being treated unfairly when they are asked to show an ID.

Additionally, the policy of asking to see a discount fare ID upon boarding can increase boarding times and result in rider/driver conflict when there is a question or issue with the ID presented. Currently drivers must act not only as operators of the vehicle, but also as fare enforcement officers. Many drivers take this fare enforcement responsibility seriously, and thus there seems to be a general concern

amongst drivers surrounding fare evasion. This concern may increase the instances of rider/driver conflict.

Option 2: Shift enforcement to offboard

Transitioning the responsibility for fare enforcement from time of use (onboard) to time of purchase (offboard) can address many of the current issues with fare enforcement. Shifting enforcement offboard takes that responsibility away from bus operators, reducing conflict with passengers and allowing operators to focus on safe and on-time operations rather than boarding disputes. In other words, operators can transition to more of a customer service role as opposed to an enforcement officer role.

Numerous stakeholders expressed an interest in shifting operators away from an enforcement role. This shift was named as a specific desire by a number of TheRide staff in our on-site interviews. When we spoke to two of the operators during the on-site visit, they stated that enforcement varied among operators. Some operators shy away from conflict with riders and carry out lower levels of enforcement, while others take pride in their enforcement role and are more strict. The operators admitted that they occasionally are inconsistent with enforcement themselves, requesting to see IDs only for those who discount fare eligibility isn't "obvious" and/or not requesting to see the IDs of frequent riders. At this time, current discount fare policy is unequally enforced across operators and customers. This can lead to confusion among riders and a perception of either mistreatment or fare evasion if certain riders are asked to display their IDs while others are not. Shifting to offboard enforcement would eliminate this inconsistency because a backend system would be in charge of determining eligibility at the time of boarding based on the account tied to the fare product presented, giving a green light or a emitting a "ping" to indicate a valid reduced fare product, instead of asking that the operator make this determination. While this would be a culture change for some drivers, this message of desired consistency could be promoted to describe the need for the change.

This change also has the potential to speed up boarding times due to reduced conflict. Enforcement through electronic media, such as smart cards, also allows for automatic eligibility expiration (e.g. youth pass eligibility expires automatically at 18) and can significantly simplify the administration of discount and free fare programs. Additionally, combining technology with offboard enforcement generates much better data on discount fare prevalence and individual usage rates. Currently, TheRide relies on farebox data and records of Fare Deal ID card distributions to understand their discount fare market, but these data can often be incorrect or incomplete. Technology would help improve the accuracy and completeness of this data, providing TheRide with better resources for planning and financial analyses.

Shifting to offboard enforcement however would require investment in the necessary fare collection technology. The level of investment would depend on the number of offboard sites available for distribution of reduced fare media. Depending on the details of the technology and whether rider photos were printed on the cards, the capital cost could range from a few hundred dollars to a few thousand dollars per location.

Third Party Pass Programs

Third party pass programs constitute a significant portion of TheRide's annual revenue and ridership.

TheRide currently has third party pass program agreements with University of Michigan (MRide), participating employers in the Downtown Development Authority boundary (go!Pass), Washtenaw Community College (WCC), Google (MyCommuter), and Ann Arbor Public Schools (Exceptional Pass). Each of these program contracts have been negotiated independently from the others.

Option 1: No change to current reimbursement pricing

Current contracts for MRide, go!Pass, WCC, and Exceptional Pass take into account an estimated number of transfers as well as an estimated number of discount riders when determining the per-ride reimbursement rate. This pricing methodology provides third parties with a contract amount that approximates what the participating individuals would pay in aggregate outside of the contract, and could be considered the most "fair" rate to charge third parties. However, while it is common to incorporate transfer rate discounts into contract pricing, it is not common to estimate the number of discount riders covered through a program, especially with as many discount categories as TheRide offers.

Option 2: Do not incorporate discounts into pricing of per-ride rates for pass programs

TheRide could explore renegotiating its third party contracts when they come up for review to only include a discount for expected transfer rates and not for rider category discounts. Eliminating the rider category discount from consideration would bring TheRide in line with industry standards. Additionally, this may be the best time to have this conversation with third parties as the agency explores eliminating the seniors ages 60-64 discount altogether.

We've reviewed the federal regulations requiring half-fares for certain rider groups to determine if this recommendation would render compliance issues and have found no evidence that this would violate any federal rule. Federal law under 49 USC 5307 (c)(1)(D) requires public transportation agencies that receive Federal Transit Administration (FTA) 5307 funding to offer reduced fares for fixed route services to people with disabilities and seniors during off-peak hours that is not greater than 50% of the peak hour fare. For pass programs that do not pass the cost along to riders, the FTA rule would not apply, for a number of reasons. First, though many do, federal recipients are not required to offer half fares on payment options such as monthly passes. Second, there are no apparent federal rules regarding the business arrangement between the transit agency and the participating businesses that would require the agency to consider ridership or any other factor in establishing the program's price. Finally, because fares for participating riders in the program are essentially free, the discount given is beyond a 50% reduction in the peak hour fare.

There are some agencies that choose to maintain rider category discount pricing for third party contracts where all participants are eligible for the same discount, such as with the AAPS Exceptional Pass. TheRide may consider maintaining this contract as is even if the agency chooses to renegotiate the other contracts for this reason.

This option of removing rider category discounts from third party pass program pricing is modeled in the second iteration of Alternatives 1 and 2.

Part II: Modeling

Modeling Alternatives Details

	Baseline	Alternative 1	Alternative 2
Transfers	Retain 90-min one-way transfers	Offer single ride and separate 2-hour pass instead of transfers; use magstripes for 2-hour passes	Transition to 2-hour pass on electronic fare media only; all cash rider pay per boarding; transfers eliminated
Change Cards	No modeling		
1-Day Pass	Retain Full Fare 1-Day Pass	Discontinue Full Fare 1-Day Pass	Discontinue Full Fare 1-Day Pass
Tokens	Retain Tokens for General Public & Social Service Agency	Tokens available only to Social Service Agencies and Nonprofits; Token priced at single ride Magstripe transfers issued only for tokens	Tokens available only to Social Service Agencies and Nonprofits; Token priced at single ride Magstripe transfers issued only for tokens
30-Day Pass	Retain 30-Day Pass at current pricing	Retain magstripe 30-Day Passes Iteration 1: 38.7 Fixed Route; 20 ExpressRide Iteration 2: 36 Fixed Route; 20 ExpressRide	Introduce Monthly Fare Capping (electronic only) and retain magstripe 30-Day Passes Iteration 1: 38.7 Fixed Route; 20 ExpressRide Iteration 2: 36 Fixed Route; 20 ExpressRide
Rider Category Discounts	Retain free rides on Fixed Route for ARide, GoldRide and PCAs Retain 50% discount for income eligible riders, students, persons with disabilities (non-ADA), and individuals 60-64 Retain current flat pricing on GroceryRide Retain 50% discount on NightRide/HolidayRide for ARide and GoldRide No discounts on ExpressRide	Offer 50% discount on Fixed Route for seniors 65+ and persons with disabilities (ADA and non-ADA) to be compliant with federal law Discontinue discount for income eligible riders, students, and individuals 60-64 GroceryRide - Set fare at fixed route pricing and apply Fixed Route 50% discounts NightRide/HolidayRide - Offer 50% discount for persons with disabilities (ADA and non-ADA) and seniors 65+ No discounts on ExpressRide	Retain free rides on Fixed Route for ARide and GoldRide Retain 50% discount for income eligible riders, students, and persons with disabilities (non-ADA) Discontinue discount for individuals 60-64 GroceryRide - Set fare at fixed route pricing and apply Fixed Route 50% discounts. Make service free for ARide and GoldRide to be consistent with Fixed Route. NightRide/HolidayRide - Offer 50% discount for income eligible riders, students, and persons with disabilities (non-ADA). Make service free for ARide and GoldRide No discounts on ExpressRide
Fare Increases	No modeling		
Service Types	Current fare pricing	Iteration 1: Current pricing; no established multiple Iteration 2: New pricing based on established multiple	
Fare Technologies	No modeling		
Fare Enforcement	No modeling		
Third Party Pass Programs	Current reimbursement pricing	Iteration 1: Current reimbursement pricing Iteration 2: Reimbursement without Reduced Fare discount	

Modeling Alternatives Assumptions

We made a number of modeling assumptions in order to run both Alternatives 1 and 2. Many of these assumptions are built into the model's structure in terms of how rider categories and fare media were segmented within the model. This structure and the assumptions behind the distribution of current ridership into these segments are detailed in Technical Memo #6: Fare Model Baseline Calibration & Assumptions. If the reader desires a visual understanding of how the below assumptions were applied to the models, Technical Memo #6 and the model files themselves (Baseline, Alternative 1: Iteration 1, Alternative 1: Iteration 2, Alternative 2: Iteration 1, and Alternative 2: Iteration 2) serve as helpful references.

Both Alternatives

The model makes the following assumptions regarding both Alternative 1 and Alternative 2:

- Any changes to the status quo are instituted starting in FY2019 and carried through to FY2022. Ridership and revenue figures from FY2017 and FY2018 thus represent the baseline (with FY2018 simply assumed to be the exact same in terms of ridership and revenue as FY2017) and can be compared to the FY2019-FY2022 figures to assess the effects of the changes entered into the model.
- For Iteration 2 under Service Types, we based the service pricing on an established multiple bringing the full fare for ExpressRide from $6.25 to $6.00 (4x local fixed route), the full fare for GroceryRide from $0.75 to $1.50 (1x local fixed route), and the full fare for NightRide/HolidayRide from $5.00 to $6.00 (4x local fixed route). The model then calculates discount fare prices as 50% off these new full fare prices.
- For Iteration 2 under Third Party Pass Programs, new reimbursement rates are calculated for each of the third party pass programs. These new rates include only a transfer discount and a bulk purchase discount, and do not include a reduced fare discount.

Alternative 1

The model makes the following assumptions regarding Alternative 1:

- Any rider currently classified as a "cash with transfer" rider will migrate to the 2-hour pass when 90-minute transfers are eliminated for all non-token riders. This 2-hour pass is priced at $2.00 within the model. Though this pass price is higher than the current $1.50 cash fare with a free transfer, the 2-hour pass still makes more financial sense than buying multiple single rides at $1.50. This logic supports the migration of individuals from "cash with transfer" to the 2-hour pass. The $2.00 price of the 2-hour pass is an assumption and can be adjusted if desired.
- When the 1-Day Pass is eliminated, these riders will migrate to the 2-hour pass, the 30-Day Pass, and the single ride fare products. The model calculates the proportion of riders who migrate to each of these products automatically. The majority are assumed to migrate to the 2-hour pass and the 30-Day Pass.

- Even if tokens are restricted to social service agencies and nonprofits, we have assumed the same number of tokens will be used each year. While likely not entirely accurate, there is not sufficient data to make a different assumption, and the number of tokens collected is small enough that fluctuations in their use should not greatly impact TheRide's overall ridership and revenue.

- For groups whose discounts are eliminated under Alternative 1, their fares are bumped up to full fare starting in FY2019. The fare for ARide and GoldRide customers also increases, but in their case from free to $0.75 for all single ride tickets to reflect federal guidelines. These fare increases are modeled across all of the services in the model except ExpressRide. On GroceryRide, ARide and GoldRide individuals who currently pay the full $0.75 fare end up paying the same fare as before once their 50% discount is applied to the new $1.50 full fare. Thus, these two rider groups did not require any pricing changes.

- Individuals with non-ADA disabilities become eligible for half-fare on NightRide/HolidayRide services, representing a deviation from current practice. To account for this, we estimate the number of riders currently paying full fare on NightRide/HolidayRide who are individuals with non-ADA disabilities. We then manually shift these riders out of the Full Fare category and into the Reduced Fare category on tab 5 of both Alternative 1 model files.

Alternative 2

The model makes the following assumptions regarding Alternative 2:

- Magstripe transfers are eliminated for all fare media types except tokens, whose sale is restricted to social service agencies and nonprofits, similar to Alternative 1. However in Alternative 2, the 2-hour pass is only available to customers who migrate to a new electronic fare media (mobile ticketing and/or smart cards). All cash riders must pay $1.50 per boarding. Because the electronic 2-hour pass represents an entirely new fare product, we manually input new ridership distributions into tab 2 of the Alternative 2 model files. The new ridership distribution assumes all "cash no transfer" riders continue buying single ride tickets, but that all former "cash with transfer" riders and all former 1-Day Pass users migrate to the electronic 2-hour pass.

- Only seniors 60-64 lose their discount. All other current rider discounts remain. Fares for this rider category thus increase to full adult prices starting in FY2019.

- The free fare discount for ARide and GoldRide customers expands to NightRide/HolidayRide, and Fare Deal and student discount riders can use the service at a 50% discount. These shifts in eligibility are modeled using tab 5 of the model files. First, we calculate the number of ARide and GoldRide customers who would use the free service by multiplying the FY2017 number of ARide and GoldRide customers by their elasticity rate, which is estimated at 0.4. This means the model assumes that 1.4x the number of current ARide and GoldRide customers will use NightRide/HolidayRide when this service becomes free to them. Second, we estimate the

number of riders currently in the full fare category who shift to the 50% discount category. Since Fare Deal ID card holders and students constitute 15% of ridership according to TheRide's 2017 onboard survey, 15% of riders in the full fare category are shifted out of full fare and into the reduced fare category. Third, to estimate the final ridership number for the reduced fare category, we subtract the previous ARide and GoldRide customers out of the reduced fare category.

- TheRide implements fare capping. Constructing an excel file capable of modeling fare capping requires a number of adjustments to the model, and added assumptions within the files.
    - In terms of adjustments, five new fare products were added to the Alternative 2 model files to represent each of the electronic, capped pass types available. Then, the names of the existing 30-Day Passes were changed to "30-Day Pass - Public/Social Serv. Magstripe" to distinguish them from their electronic, capping counterparts.
    - In terms of assumptions, we estimate the proportion of 30-Day Pass holders who will shift from the 30-Day Pass magstripes to an electronic fare capping product at 50% and use this assumption to redistribute ridership between the products on tab 2 "IN-New Fare Products." A number of pieces of research informed this estimate:
        - In the results of the survey performed as part of this fare study in April 2018, 49% of respondents indicated that they were either likely or very likely to use mobile ticketing or smart cards (electronic forms of fare payment),
        - If all current Full Fare, 30-Day Pass users who logically should switch to fare capping (i.e. those who purchase a 30-Day Pass but do not reach the breakeven threshold) chose to switch, 43% of current magstripe users would migrate to the electronic fare capping option, and
        - Peer agencies have experienced migration rates from approximately 45% up to 65%, when traditional fare media remain easily accessible for customer purchase.

      This migration assumptions can be changed for each separate 30-Day Pass fare category in the future by using the table in the "Capping Summary" tab of the Alternative 2 model files.
    - We also made assumptions regarding the two types of revenue loss created by fare capping. First, the model assumes a 1.75% revenue loss in Iteration 1 and a 2.00% revenue loss in Iteration 2 due to current cash riders who pay more than the equivalent price of a 30-Day Pass in a single month since once these current cash riders begin hitting the fare cap, they will no longer pay for their additional trips over the breakeven price point. The difference in these lost revenue assumptions is a reflection of the different 30-Day Pass pricing multiples in each of the Iterations; with a lower multiple

(Iteration 2), the number of current cash riders who will hit the cap increases, and thus the revenue loss from capping these cash riders increases. While there is not sufficient data to estimate these cash rider revenue loss figures for TheRide specifically, data from peer agency fare capping analyses informs these percentage loss assumptions. Revenue loss estimates computed by transit agencies with enough data suggest approximately 1.6% to 2.0% in terms of the percentage of revenue lost specifically from cash riders when fare capping is instituted. These percentage loss assumptions are applied to the revenue estimates for the "new electronic fare with transfer" fare products on tab 5 of the model files. Second, the model calculates an expected revenue loss from riders who currently buy a 30-Day Pass but do not reach the breakeven point. This analysis uses 30-Day Pass data provided by TheRide to calculate the expected revenue loss for each 30-Day Pass product (excluding the EMU 30-Day Passes which are not available as an electronic fare capping product) by determining which riders would not hit the cap and then calculating the difference between the revenue from their single ride payments and what they would have paid for a 30-Day Pass. These calculations are done using additional sheets that have been added to the end of the model files. On these sheets, the 30-Day pass multiple can be easily changed so that various price multiples can be explored within the fare capping structure.

Modeling Results & Evaluation

Modeling Results Overview

RESULTS	Baseline (2017-2018)	Alternative (2019-2022)	Difference	Percentage Change
Alternative 1				
Iteration 1				
Ridership	6,648,825	6,227,119	- 421,707	- 6.3%
Revenue	$4,950,493	$5,603,494	+ $653,002	+ 13.2%
Iteration 2				
Ridership	6,648,825	6,237,773	- 411,052	- 6.2%
Revenue	$4,950,493	$5,730,679	+ $780,186	+ 15.8%
Alternative 2				
Iteration 1				
Ridership	6,648,825	6,648,553	- 272	- 0.0%

Revenue	$4,950,493	$5,126,487	+ $175,994	+ 3.6%
Iteration 2				
Ridership	6,648,825	6,653,474	+ 4,649	+ 0.1%
Revenue	$4,950,493	$5,258,393	+ $307,900	+ 6.2%

Alternative 1: Iteration 1 Evaluation

Results by service type

Service Type	Change in Ridership	Change in Revenue
Fixed Route	- 421,456	+ $643,292
ExpressRide	0	$0
GroceryRide	- 251	+ $424
NightRide/HolidayRide	0	- $3,561

Fixed route undergoes the largest changes in ridership and revenue of the services within the model. Since most of the alternatives evaluated affect fixed route, this is to be expected. The removal of a number of discount categories likely contributed to the decrease in rideship and increase in revenue. Also, a decent portion of the revenue increase is associated with the 2-hour pass price increasing from $1.50 (original “cash with transfer” price) to $2.00. Since this was an assumption that was made to run the model iterations, and not an explicit directive in pricing from TheRide, it should be noted that this favorable revenue position would change if that price assumption were to be updated.

ExpressRide ridership and revenue remain unchanged since none of the alternatives modeled in Iteration 1 affect ExpressRide service. The impacts on GroceryRide are a reflection of increasing the service’s base fare to be commensurate with fixed route full fare. While this is balanced out to a certain extent by extending a 50% discount to individuals with disabilities (ADA and non-ADA) and seniors 65+ and thus keeping their fare at $0.75, eliminating discounts for low income individuals and seniors 60-64 on TheRide’s services raises these two groups’ fares to the full $1.50. With this fare increase, it is reasonable to see a slight decrease in ridership and a slight increase in revenue. The changes in NightRide/HolidayRide are a result of individuals with a non-ADA disability becoming eligible for half-price fares on the service. No attraction of riders was expected due to this change, thus the impact of this change was only reflected in revenue and not ridership.

Alternative 1: Iteration 2 Evaluation

Results by service type

Service Type	Change in Ridership	Change in Revenue
Fixed Route	- 409,203	+ $756,983
ExpressRide	+ 219	- $4,080
GroceryRide	- 251	+ $424
NightRide/HolidayRide	- 1,817	+ $11,511

As with Alternative 1: Iteration 1 above, fixed route undergoes the largest changes in ridership and revenue due to the number of modifications within the model that affect this service specifically, including the discount category removals and the increase in price from switching to the $2.00 2-hour pass. ExpressRide sees some loss in revenue and gain in ridership because the service's base fare price goes down to $6.00 from $6.25. GroceryRide impacts are the same as in Alternative 1: Iteration 1 since the same modifications from Iteration 1 hold over into Iteration 2. NightRide/HolidayRide receives a revenue bump from increasing the base fare to $6.00 from $5.00, but sees the resulting ridership loss associated with this fare increase as well.

Alternative 2: Iteration 1 Evaluation

Results by service type

Service Type	Change in Ridership	Change in Revenue
Fixed Route	- 4,992	+ $195,934
ExpressRide	0	$0
GroceryRide	+ 1,381	- $730
NightRide/HolidayRide	+ 3,339	- $22,672

The ridership loss on fixed route in Alternative 2: Iteration 1 is much less pronounced than in the Alternative 1 models because the majority of riders are able to retain their discounts on the service. This does translate, though, to a less substantial revenue gain. We can assume that the revenue losses from fare capping are part of the reason for the less substantial revenue gain. Iteration 1 makes no changes to ExpressRide's pricing structure, so revenue and ridership on this service remain the same. GroceryRide experiences an increase in ridership and decrease in service in part because the service is now free for ARide and GoldRide customers. NightRide/HolidayRide similarly experiences an increase in ridership for the same reason. The larger drop in revenue though is a reflection of the larger initial ridership on NightRide/HolidayRide, the relatively higher fare which is now forgone, and the transition of a significant number of individuals (Fare Deal and Student riders) from full fare to half-fare.

Alternative 2: Iteration 2 Evaluation

Results by service type

Service Type	Change in Ridership	Change in Revenue
Fixed Route	+ 1,758	+ $316,488
ExpressRide	+ 219	- $4,080
GroceryRide	+ 1,381	- $730
NightRide/HolidayRide	+ 1,291	- $9,836

Alternative 2: Iteration 2 is the only scenario in which fixed route experiences an increase in both ridership and revenue. These results show promise for fare capping in combination with the other strategies included in this iteration. All other services in this model similarly see an increase in ridership, even with the increase in fare for NightRide/HolidayRide and GroceryRide. The extension of free service to ARide and GoldRide customers and the extension of a 50% discount to Fare Deal riders and students balances out the ridership loss in the full fare categories on NightRide/HolidayRide and GroceryRide. ExpressRide sees a bump in ridership and loss in revenue from the reduction in full fare from $6.25 to $6.00.

Part III: Recommendations

Recommendation Summary

These recommendations are a product of the quantitative and qualitative analyses described above. Implementation of many of the recommendations below is dependent upon implementation of certain other recommendations. This speaks to the intertwined natures of fare policy and fare collection technology. Because of these dependencies, the recommendations below should be viewed for the most part as a package. Attempts to implement some recommendations and not others must be thought through carefully by TheRide staff. Staff should confirm that the necessary policy and technology structures are in place to ensure successful implementation of any recommendations that are selected individually from the list below. Interactions between recommendations have been noted within the descriptions below, where appropriate, to help TheRide identify any dependencies. As with any proposed fare change, it will be necessary to conduct a Fare Equity Analysis per the federal civil rights guidance to determine whether the fare change would result in a disparate impact to minority riders or a disproportionate burden on low-income riders.

Transfers

Recommendation 1: Transition from one-way transfers to time pass as base fare

TheRide should transition to a 2-hour time pass as its base fare, thus eliminating single ride tickets. Transitioning from a single-ride fare with the option of a free transfer to a 2-hour time pass would bring a number of benefits to the agency.

First, a 2-hour pass would help address the dilemma of riders whose trips cannot be completed within the current 90-minute transfer window when headways increase during off-peak service times by giving them an extra 30 minutes to board their final vehicle. This was named as an issue during initial interviews with TheRide staff, who have had riders lament an inability to complete their entire trip on a single fare payment. Second, this policy change would allow TheRide to discontinue issuance of transfers to the general public. (Customers of social service agencies using tokens as their fare payment would still be able to receive a paper transfer, as detailed in the Tokens Recommendation further on in this document). According to maintenance personnel at TheRide, the issuance and acceptance of transfers is a main source of farebox TRiM unit issues. Eliminating their general public use would help reduce the number of maintenance calls and the magnitude of maintenance costs associated with these TRiM unit issues. Additionally, customers who are new to public transit may not understand the concept of a transfer or know that they must ask to be issued one upon boarding. A 2-hour time pass, on the other hand, is easy to understand even for new riders and does not require any interaction with the driver. This change in fare structure could help TheRide achieve its stated goal of building an attractive service by facilitating more understanding of how fares work even amongst current non-riders. Third, transitioning to a 2-hour pass as the base fare would position TheRide well for implementing mobile ticketing since time passes are the most logical type of fare product to enable on a mobile ticketing

platform. A time pass base fare is the most common type of base fare product offered by other transit agencies on their mobile ticketing platforms.

We recommend that TheRide extend this implementation of a 2-hour pass as base fare not just to fixed route service, but also to ExpressRide. The ExpressRide 2-hour pass would be priced above the fixed route only 2-hour pass since ExpressRide is considered a premium service. For commutes into Ann Arbor, riders could use their ExpressRide 2-hour pass to transfer onto local fixed route services instead of asking to be issued a free transfer when boarding ExpressRide as they do now; this is a logical extension of the current policy that allows an ExpressRide customer to use their 30-Day ExpressRide Pass on local fixed route services. Since the travel times on Routes 91 and 92 are under an hour from first stop to last stop, a 2-hour pass would provide sufficient time for a rider to transfer from ExpressRide to fixed route. For reverse commutes, riders would be asked to pay an upcharge equal to the difference between the price of a local fixed route only 2-hour pass and an ExpressRide 2-hour pass if using a local fixed route 2-hour pass to board an ExpressRide vehicle. This is in line with current policy at TheRide. This upcharge could require a second transaction upon boarding the ExpressRide vehicle, or, if new fare payment technologies are implemented, a rider could simply buy an ExpressRide 2-hour pass valid on both local fixed route and ExpressRide in advance of their reverse commute. ARide and GoldRide customers, since they currently ride free on fixed route services, would simply pay for a full ExpressRide 2-hour pass if transferring from local fixed route to ExpressRide. This would not be a federal compliance concern because ExpressRide is a premium service, and discounts on premium services are not covered under the relevant federal half-fare guidelines. Depending on how you price these new 2-hour pass products, though, there is the possibility for an equity concern with regards to disproportionate impacts on sensitive communities. Appropriate analyses would need to be conducted to determine if the new pricing creates a disproportionate burden on minority or low-income populations.

If TheRide decides to follow through with this recommendation, there will be two main things to consider before implementation. First, TheRide must decide how it would want the 2-hour passes to be priced in relation to current single ride tickets. Since this recommendation would institute the 2-hour passes as the base fare on local fixed route and/or ExpressRide, if TheRide decides it wants the product to be priced above the current single ride tickets then enacting this recommendation will result in a fare increase. Second, TheRide must keep in mind that with a 2-hour pass riders would have the potential to complete round trips using a single pass. Though there did not seem to be a clear, agency-wide consensus on the reasoning behind why round trips are not allowed under the current transfer policy, this aspect of 2-hour passes should be considered for its possible effect on revenue. TheRide may want the 2-hour pass to be priced above the current single ride to proactively address some of the revenue loss that may result from riders completing these round trips.

With regards to modeling this second consideration, at this time, the data provided by TheRide does not have the necessary granularity to determine what percentage of riders would complete roundtrips on a 2-hour pass. As such, the model for this study did not lower any ridership figures for the 2-hour pass to reflect the absorption of these round trips. This is, however, a manual adjustment that TheRide could input into the model on their own in the future if they are able to obtain the necessary data to estimate

the percentage of riders who would complete an entire round trip within 2 hours (or whatever period of time a time pass may be valid for).

This policy recommendation of instituting a 2-hour pass can be implemented alongside technological improvements, as was modeled in Alternative 2, or as a standalone policy change on magstripe tickets, as was modeled in Alternative 1. Implementing the change alongside technology may lend itself to a more cohesive communication strategy when telling riders about the change. If new fare collection technology is not expected in the near future, however, it may be wise for TheRide to move forward with this policy on its own because riders' need for a longer period of time in which to complete a single trip with multiple boardings is unlikely to disappear.

Recommendation 2: Enable formal transfers between FlexRide and Fixed Route service

In early interviews, TheRide staff explained that there had been some difficulty in deciding how to price their new FlexRide pilot program in relation to fixed route, and that they continued to debate how and to what extent FlexRide should be integrated with fixed route services now that it was up and running.

No matter the specific relationship between FlexRide and fixed route, the two services should be connected by a formal transfer policy to demonstrate to riders that TheRide functions as a cohesive unit with regards to its variety of services. Formalizing transfers between the services should encourage riders to use both options together as a comprehensive system instead of viewing them as siloed operations by making these transfers more attractive and convenient, two qualities of service that are also identified as goals leading this study. Given FlexRide's current status as a pilot program that serves primarily to connect people with existing bus routes in the southeastern portion of Ypsilanti, it would be best to treat FlexRide as an extension of local fixed route service. The policy regarding transfers that TheRide chooses to enact for transfering between fixed routes should thus apply also to transfers between FlexRide and fixed route. Acknowledging the recommendation above, enacting formal transfers using the fixed route policy would mean 2-hour passes would be valid on both fixed route and FlexRide services.

As discussed in Part 1 of this document, enabling these transfers will require some additional investment into the infrastructure present on FlexRide vehicles and possibly fixed route vehicles as well. Until TheRide decides which fare media technology to move forward with on its fixed route services (i.e. smart cards and/or mobile ticketing), it is difficult to make a final technology recommendation for these transfers. In the interim, the cheapest and easiest way to enable transfers between the services would be to enable visual validation of FlexRide media on fixed route and vice versa. Immediate implementation of visual validation would be likely be accomplished through the use of paper transfers. During implementation of mobile ticketing, visual validation could be used on FlexRide for the mobile tickets. There is not a similar visual validation available for smart cards. Visual validation forgoes a rich data set from the transfers between service types, data that would be particularly valuable as TheRide designs service to increase cost effectiveness. Visual validation also carries some risk of misuse and fraud, although if it is only visual on FlexRide, and electronic validation is used on fixed route services, the risk is small.

Change Cards

Recommendation: Eliminate change cards

Change cards create well-documented negative impacts on operations, maintenance, and occasionally customer-operator interactions due to regular issues with the TRiM units. Each of the staff groups and operators spoken with at TheRide named change cards as a pain point in operations and identified a number of the negative impacts they have on TheRide's services. These impacts include costs in the form of lost fare revenue, maintenance and repair costs, and time costs due to boarding delays. Additionally, they add further complexity to TheRide's fare structure and have caused some of TheRide staff to be concerned about the opportunity for fraud. While staff are not aware of any current cases of fraud, operators are taught during training that they can tell the farebox to accept any fare media as a dollar value of $1, $5, or $10 and then issue the appropriate amount of return money onto a change card.

Eliminating change cards would simplify TheRide's fare structure, eliminate any concerns of fraud, and improve operation and maintenance efficiency. It would also help address an identified weakness in TheRide's fixed route service, which is that change cards are being used for purposes beyond their original intent. Operators have said that riders will load the maximum $10 into the farebox, then use the change card they are issued as a type of stored value card; since change cards are not intended for extended use, riders using them as makeshift stored value cards exacerbate issues related to change cards malfunctions at the farebox. Given this current unintended use of change cards that indicates the desire for a stored value and/or prepay option, eliminating change cards could incentivize customers to migrate to non-cash forms of fare payment. In fact, if in the future TheRide implements a new fare collection technology, such as a smart card system, riders could achieve the same benefit of a change card by loading cash value onto their smart card; their balance would then be available for future use, and riders would not have to worry about carrying exact change or overpaying.

This proposed policy change is consistent with policies at TheRide's peer agencies. Only four of the ten peers chosen for this study offer change cards; one of these peers is Grand Rapids, who has proposed eliminating change cards as part of their new electronic fare system. In Four Nines' experience, many transit agencies are making the decision to move away from change cards.

In terms of implementation timeline, there is no technical reason the elimination of change cards cannot be done independently of a fare payment technology upgrade. However, from a practical and user convenience perspective it would be ideal to do so when an alternative that gives riders a way of not overpaying (i.e. mobile ticketing and/or smart card) becomes available. If TheRide does not see itself implementing new fare payment technology any time soon, the agency must weigh the benefits of eliminating change cards in the near-term (e.g. reducing wear-and-tear on the TRiM units) against the impacts this would have on riders. Since change cards function as a convenience mechanism instead of a base fare, it would be difficult to quantify the equity impacts of this elimination. Because of their convenience mechanism nature, though, eliminating this product is unlikely to produce problematic equity impacts with regards to federal requirements.

Tokens

Recommendation: Tokens only for social services agencies; eliminate tokens for public purchase

Revisiting the role tokens play in operations was identified as a key opportunity for TheRide to explore during this study. Over the course of conversations with TheRide, it has been determined that tokens, while of great benefit for use with social service agencies and nonprofits, add another layer of complexity to an already crowded fare media landscape at TheRide. Eliminating tokens for public purchase would simplify TheRide's fare structure, could reduce the intake of tokens and therefore the employee hours spent repackaging them (a main concern for the finance department), and could incentivize customers to migrate to electronic forms of fare prepayment for rides.

There are few downsides to eliminating tokens for public purchase. Only 3% of fare study survey respondents and only 2% of 2017 onboard survey respondents indicated that they use tokens as their regular fare media. While some people may like the simplicity, the ability to pre-pay, or the ability to purchase them from Bank of Ann Arbor locations, tokens are not the only fare medium that confers these benefits. Magstripes are easy to board with according to both operators and passengers; base fare magstripes, and possibly smart card fare media, could be sold at Bank of Ann Arbor locations to preserve retail outlet options and the ability to pre-pay.

Tokens offer social service agencies a reliable, simple way to confer transit benefits to their clients. Tokens also offer TheRide a contract fare medium that is easy to administer and cheap to distribute to these agencies. No other fare media, current or proposed, meet these criteria as well as tokens do. Limiting tokens to social service agencies and nonprofits could also provide TheRide with a better idea of how these entities' clients use TheRide's system if token use and collection are tracked.

While this recommendation could go so far as proposing the total elimination of tokens as a fare media, Four Nines has found in conversation with other transit agencies that tokens remain the simplest and most reliable way of providing transit benefits to social service agencies that they can easily pass along to their customers. Tokens thus represent a valuable fare media that, as opposed to disappearing, are actually making a comeback in the transit industry.

Even if tokens are restricted only to social service agencies, it will be important to reinforce policies surrounding tokens. In our conversations with operators and staff, there was some confusion around whether two large, half-fare tokens can be combined to equal a small, full-fare token and whether a change card can be given for the difference between the full fare and half fare tokens. The Four Nines team received multiple and different answers to these questions when asked.

30-Day Pass

Recommendation 1: Lower the 30-Day Pass pricing multiple for fixed route

TheRide should lower the pricing multiple on its 30-Day Pass products to encourage more riders to

migrate to the Passes. The desire to leverage this pass product as a way to increase ridership has been a common thread in conversations with TheRide staff, and the current 30-Day Pass price multiple on fixed route was identified as a challenge to increasing ridership during Four Nines review of the agency's needs, opportunities, and weaknesses. 30-Day Passes, when paid for upfront, represent a sunk cost for the rider. Thus, a 30-Day Pass holder is incentivized to use TheRide's services more often since each trip they take within those 30 days does not cost them any additional money. From the rider perspective, 30-Day Passes are also more convenient to swipe to board than loading cash into the farebox, one of the overall fare policy goals of TheRide.

TheRide has an opportunity to target riders who currently use change cards as a type of stored value card with this lower multiple since their current behavior points to a desire for a multiple use product and, if the recommendation of this memo is followed, change cards will be eliminated in the future. There is also room to hopefully encourage somce current cash riders to migrate to the 30-Day Pass since, according to the 2017 onboard survey, cash payments accounted for 25% of overall boardings in 2017 and for 29% of boardings by people who use TheRide six to seven days a week (and thus would already break even on a 30-Day Pass). Comparatively, only 7% of overall boardings and 11% of boardings by riders who use the system six to seven days a week were paid for using a 30-Day Pass in 2017. This hope for increase in 30-Day Pass use is supported by the results of Iteration 2 for modeling Alternatives 1 and 2, in which the 30-Day Pass pricing multiple was lowered from 38.7 (current multiple) to 36 times the adult single ride fare.

We are not equipped at this time to tell TheRide exactly what their new pricing multiple should be. Instead, we encourage the agency to test various pricing multiples by inputting these multiples into the fare model. TheRide can then use the model results to gauge the effect of different multiples on ridership and revenue. 30-Day Pass price multiples can be easily altered within the model by changing the value in cell N2 on tab 1a of each model file. The multiples tested within the model can be informed by the pricing multiples of peer agencies; TheRide could start with the multiples of the ten peers analyzed in this study, which are recorded in Technical Memo #1/#2.

Recommendation 2: Explore fare capping as a future possibility

Though fare capping shows promise according to model results, we cannot recommend fare capping at this time because TheRide does not have the necessary policies or technologies in place to implement it. Putting these policy and technology structures in place will take time, and aspects of TheRide's fare collection system will likely change between now and the time when implementation of fare capping is feasible. Instead, we recommend that TheRide use the Alternative 2 model files to predict the effects of fare capping when its system is at a point where fare capping would be feasible within a 5-year horizon since the model is designed to predict up to five years out from the baseline. At that point, the model baseline can be adjusted to reflect TheRide's new system. The results of that model will be more accurate than the results presented in this analysis since implementation of fare capping in FY2019 is not feasible.

In the interim, TheRide can learn from the results of peer agencies who have implemented fare capping. These insights can be used to gain a better understanding of capping's effect on ridership and revenue,

and these lessons could then be applied to the assumptions embedded in the fare model to create an even better prediction of the effects of capping within TheRide's system specifically. In terms of U.S. peers to watch, TriMet's capped monthly pass option began in August 2017, and DART (Dallas) plans to debut a capped fare product in August 2018.

When considering fare capping in the future, TheRide will need to consider these details of implementation:

- What services will fare capping be available on? If capping is available on multiple services, how will passengers who use multiple services in a single trip be affected? For instance, would fares paid on ExpressRide count towards the value of a local fixed route monthly cap?
- How will fare capping affect current 30-Day magstripe passes? Will these continue to be offered? If not, how will social service agency relationships be handled?
- Will discount riders only be required to hit half the full-price cap (i.e. would their cap be $29 instead of $58 under the current system)?
- Will third-party payers ask to renegotiate their contracts based on this new pricing scheme? Would UM want the cap to be incorporated into their contract pricing, for instance? (A rough calculation of what this would mean in terms of contract revenue based on FY2017 MRide ridership data has been provided to TheRide staff.)
- Is TheRide willing to switch from a 30-Day rolling pass to a calendar monthly pass, since the implementation of fare capping on a rolling pass is questionable and, if possible, would necessitate a significantly more expensive backend system?

TheRide should also consider that fare capping will always result in a loss of revenue. TheRide can predict the magnitude of this loss based on industry experience and 30-Day Pass data from the GFI fareboxes, but then the agency must decide whether this loss is acceptable to the agency from a financial perspective.

1-Day Pass

Recommendation: Eliminate 1-Day Pass

Eliminating the 1-Day Pass will simplify TheRide's fare structure and get rid of an underutilized fare product. Since 1-Day Pass holders are expected to easily migrate to another fare product, eliminating the 1-Day Pass will have little to no effect on ridership figures or the experience of riders who currently use the product. During conversations at on-site meetings, TheRide staff did not foresee any particular difficulties in communicating the financial and operational reasons for eliminating the Pass - namely, that not producing 1-Day Passes could lower fare media costs, help minimize issues with the onboard farebox TRiM units that currently print the 1-Day Passes, and simplify the current fare structure.

Because 1-Day Passes constitute less than 0.2% of boardings according to the 2017 onboard survey, even if current 1-Day Pass riders choose to move to the less expensive, recommended 2-hour pass, TheRide will experience a very minimal loss in revenue.

Rider Category Discounts

Recommendation 1: Discontinue discount fares for individuals 60-64

It is recommended that TheRide eliminate discount fares for individuals ages 60-64 on its services. The current practice of offering this discount goes beyond federal standards, which only require ADA-eligible individuals and seniors ages 65 and older to receive a 50% discount on basic services during off-peak hours. This is a very small segment of riders (approximately 1% of total ridership according to the 2017 onboard survey) to target with a discount. While the small size of this rider category means that TheRide is unlikely to see any increase in revenue due to this policy change, the agency will save time and resources by not needing to distribute a third Fare Deal ID card type. Additionally, bus operators will have one less discount fare ID that they must be able to recognize; both staff and operators brought up the difficulty of training operators to recognize the multitude of Fare Deal ID cards during interviews and named this as an area for improvement at the agency. Additionally, as more people work into their early 60s, removing this discount presents less of an economic burden to the individuals who would be impacted by this change. Still, to minimize backlash to the change, it is recommended that TheRide determine a cease date for accepting new applications for the 60-64 discount but then grandfather in all individuals who were already deemed eligible prior to this date. As these individuals reach age 65, the discount category will naturally phase out.

Recommendation 2: Do not eliminate discounts for PCAs on fixed route services at this time

TheRide staff expressed some interest in exploring the elimination of discounts for personal care attendants (PCAs) on local fixed route services because of a perception among staff and operators that riders who did not in reality serve as PCAs were committing fare evasion by claiming PCA status. As identified in the review of the needs, opportunities, and challenges at the agency, TheRide requires Fare Deal ID cards to identify whether or not the card holder requires a PCA, but PCAs themselves are not required to have their own identification card since a single Fare Deal ID card holder is likely to have multiple PCAs. Instead, TheRide created a policy that states a Fare Deal card holder and their PCA must deboard at the same stop for the PCA to be eligible for the discount. However, there is still a lingering perception of fare evasion even after implementation of this policy.

Though concerns about fare evasion still remain, Four Nines does not recommend moving forward with elimination of the PCA discount at this time. We instead recommend that TheRide begin to gather sufficient data to understand the possible implications of eliminating the PCA discount since anecdotal and perceived inequity is all that has been presented at this time. When later analyzing this data on rates of PCA discount use and likely rates of PCA discount abuse, TheRide should keep in mind that paratransit service costs may go up if the elimination of the PCA discount encourages disabled riders to switch from using fixed route service to using paratransit service on which PCAs ride free. TheRide should compare these increases in paratransit costs to the lost revenue estimated to be a result of PCA discount abuse. The agency may decide that based on these numbers, a certain level of fare evasion is worth encouraging riders to use fixed route as opposed to paratransit services.

Recommendation 3: Establish consistent discounts on services using current discount rates

TheRide should extend all of its current fixed route discounts to GroceryRide and the majority of its fixed route discounts to NightRide/HolidayRide (minus the discount for individuals 60-64 in keeping with the recommendation above). Doing so would be a major step towards TheRide's goal of bringing more consistency to its fare structure and would address staff's concerns around the difficulty of explaining to new discount fare category riders the variations in their discount eligibility depending on service type.

To enable the benefits of consistency and therefore simplicity to the rider that this recommendation is designed to bring, this recommendation should be implemented in concert with raising GroceryRide's base fare from $0.75 to the fixed route base fare of $1.50. Because so many current GroceryRide riders fall into discount rider categories, hardly any of these riders would experience an increase in fares if consistent discounts are enacted on the service. In fact, riders who fall into the ARide or GoldRide categories would go from paying $0.75 to riding for free, which is expected to produce a slight increase in ridership on the service.

Regarding NightRide/HolidayRide, it is recommended that TheRide carry its 50% Fare Deal and student discounts over to the service in pursuit of increasing consistency. However, we do not at this time recommend that TheRide make NightRide/HolidayRide service free for ARide and GoldRide customers (or for PCAs), which would be in line with their discount on other non-paratransit services. NightRide/HolidayRide is an inherently expensive service, and making fares free for these groups is expected to induce about twice the current demand from these rider categories on the service. Thus, no decision should be made as to whether ARide and GoldRide customers should either continue receiving their current 50% discount or be raised to a 100% discount until TheRide can compare the results of their paratransit study and the likely cost per hour or rider of running ARide/GoldRide service to the results of this study and the likely cost per hour or rider of providing free NightRide/HolidayRide service. A decision regarding the level of PCA discount to offer on this service would need to be made after a decision regarding the ARide discount level. For now, we recommend that the current policy of asking PCAs to pay full fare on NightRide/HolidayRide continue.

Regarding ExpressRide, because of the nature of the financing behind its operation, we do not recommend extending discounts onto the service. Doing so could jeopardize the financial stability and viability of ExpressRide since a high farebox recovery is essential to maintaining the service.

Fare Increases

Recommendation: Establish internal indicator(s) that will be used to determine when a fare increase should happen

Considering the agency's last fare increase took place from 2007 to 2010 with no review of fares since, TheRide staff have indicated the need for a fare increase policy that provides clear direction and justification regarding fare increases to both internal and external stakeholders. This ability to justify fare increases by pointing to specific indicators will build community faith in the agency by increasing

transparency and the perception of fairness (an overarching fare policy goal). This will also provide the agency with a greater opportunity to plan for increases internally in terms of financial stability, communication strategy, and implementation processes. A formal fare increase policy based on indicators could also help to delineate the important millage votes separately from fare increase considerations by linking increases to a set agency policy, thus making the relationship between fare increase implementations and voting timelines less tense.

The needs surrounding a fare increase policy at TheRide eliminate "Option 1: Maintain current fare increase policy" from consideration since there is no fare increase policy. "Option 2: Establish a set period of time between fare increases" and "Option 3: Evaluate need for fare increase along with regular budget review" rely too heavily on mandated timelines for fare increases; these require regular implementations of a fare increase if they are to be effective. Because of TheRide's funding structure, fare revenue does not drive service level decisions to the extent it does at many other transit agencies. Instead, millages voted on by the general public are the main financial priority for the agency, even though TheRide's overall farebox recovery ratio is already generally in line with industry averages. Given this situation, implementation of an unneeded fare increase could do more harm than good by negatively affecting public opinion of the service. For these reasons, a fare increase policy that requires regular fare increases would be restrictive and ineffective for the agency.

"Option 4: Establish internal indicator(s) that will be used to determine when a fare increase should happen" on the other hand not only provides the flexibility the agency needs, but also would require TheRide staff to have an agency-wide conversation about what should necessitate a fare increase. This is an important conversation that it appears TheRide has not had in some years given there is no formal fare increase policy and that the last fare increase happened almost a decade ago. Additionally, during our analysis of needs, opportunities, and challenges at TheRide, Four Nines observed that while TheRide has some service standard performance indicators, there are no metrics related to fares. This recommendation would eliminate this weakness in TheRide's operations and administration and increase the agency's ability to balance its historic planning standards (such as ensuring 90% of households lie within ¼-mile of a bus stop) with its financial needs. These fare increase indicators could even be used beyond determining when fare increases should happen, potentially informing other finance and planning decisions as well.

In crafting this fare increase policy and its internal indicators, TheRide would have the opportunity to look to other transit agencies for guidance and to be creative in thinking about the context of their own agency's needs. Examples of indicators include:

- Inflation
- Local property values (because of the relation to millage revenue)
- Local population changes
- Fuel prices
- Labor costs
- 3rd party pass program enrollment and usage numbers
- State and federal funding amounts
- Capital project funding goals

- Comparisons to a specific set of peers
- Farebox recovery ratio goals
- Cost of service per passenger mile
- Changes in service area extent

Service Types

Recommendation: Establish all services' fares using a multiple of the base adult fixed route fare

TheRide should use a pricing multiple, with the local fixed route adult fare as the base, to price its other services. This policy would provide clear direction for the agency in the future on how to price new services. Looking beyond pricing, setting services at multiples of each other also lays the foundation for establishing future policies that encourage riders to use the variety of services operated by TheRide. With first/last mile solutions such as FlexRide on the horizon and fare products that would be valid across the services under consideration, laying this structural groundwork is especially important for the future success of TheRide. Even today, service multiple pricing could help foster better rider understanding of the current umbrella of services since people tend to intuitively understand pricing multiples. All of these benefits would help make TheRide's services more attractive, consistent, and convenient, three of the goals of this study.

Modeling results from Iteration 2 of modeling Alternatives 1 and 2 in which this recommendation was implemented indicate that lowering the ExpressRide base fare to $6.00 (4x fixed route) and increasing the GroceryRide base fare to $1.50 (1x fixed route) would not pose major risks to ridership or revenue on these services in the context of the agency's entire operations. It should be acknowledged, though, that it is difficult to ascertain the impact on ridership and revenue of this change specifically because of the variety of changes built into Alternatives 1 and 2. As such, TheRide may find it beneficial to run the model with only changes to service type pricing multiples to better predict the effect on ridership and revenue, and could even test various pricing multiples. The agency can then compare these predicted impacts with the benefits outlined above.

Fare Technologies

Recommendation: Procure a smart card + mobile ticketing system

TheRide should procure an integrated smart card and mobile ticketing fare collection system. While procuring and implementing such a system would require a significant investment of both capital and staff time, this technology upgrade would provide a host of benefits to TheRide and TheRide's customers.

Various departments expressed interest in encouraging riders to pre-pay for trips, shifting away from cash handling, reducing maintenance needs on onboard fareboxes, creating a better interface for engaging with new and potential customers, and automating as much of the boarding process as

possible to improve relationships with riders — all of which can be better achieved through the use of new fare technologies. Implementation of new fare technology could also improve the quality of data collection and reporting at TheRide. This improved data could enhance the agency's ability to track whole trips instead of just boardings and in turn more accurately price fares and passes based on actual trip usage patterns for both the general public and third party pass programs. Beyond financial decisions, TheRide could leverage this data in its service planning processes and decisions. The data could also help the agency investigate why automated passenger counter (APC) ridership is higher than what is reported by the GFI farebox. As the data collected expands, it will be important to define business rules about how the data may be used as well as how to protect personally identifiable information to ensure anonymity of riders. With respect to these data privacy concerns, there are many peer examples to look to for best practices as the number of agencies who have implemented smart cards or mobile ticketing grows.

Why smart cards?

A smart card system can improve MRide management and is the best way to give employers or other organizations the ability to manage transit passes/value for their employees or members. While it is true that the current Odyssey fareboxes have smart card capabilities, they can only read first generation proximity cards which are outdated and difficult to implement with TheRide's current system. Thus, using the technology in place would not bring much additional benefit while still increasing the fare media costs for the agency. Because of this, Four Nines recommends implementation of a new smart card system with the capabilities necessary to impart benefits to both TheRide and its customers.

TheRide could leverage the backend system that implementing new smart card technology entails to shift a significant portion of administrative duties related to third party program management onto the third parties, simplifying administration for TheRide and thus addressing the agency's interest in shifting personnel hours from managing current programs to exploring opportunities for implementing new ones. This backend system architecture could also potentially provide a more attractive and convenient customer experience as riders could go directly to their organization's transit coordinator to address issues or get questions answered. Smart cards also may be able to integrate with a potential future regional fare system.

A smart card system could add more flexibility to a third party pay program by allowing riders to pay for a base fare, for example, while the rider's e-purse could be used to pay for an up charge for ExpressRide.

Additionally, a smart card system is necessary to shift the bulk of fare enforcement to offboard. Shifting to offboard fare enforcement, discussed in more detail in the following section, would remove a significant source of operator-customer conflict, a major concern voiced by TheRide. It would also allow for automatic expiration of discount fares e.g. a student's reduced fare eligibility could be set to automatically expire following their 18th birthday. The student would not need to get a new smart card and TheRide would have better control over use of reduced fares.

New fare payment technology can also facilitate easier implementation of restrictions on third party payer program members, such as go!Pass usage only being valid during business hours or Exceptional Passes for students only being valid on on weekdays. These restrictions are not the established policy at

TheRide, but some operators perceive it as such and misinterpret third party pass use outside certain times of day or days of the week as fare evasion. Moving any time of use restrictions to technology means operators do not have to worry about (1) knowing these policies or (2) enforcing them. An added benefit of procuring a fare collection technology system with this capability would be that the process would require TheRide to formally discuss limitation policies with its third party payers. During conversations with TheRide staff and bus operators, it became clear that currently there is no formal policy between TheRide and the DDA and AAPS about limitations to the go!Pass and Exceptional Pass programs, respectively. Even without the procurement of new fare collection technology, Four Nines recommends that TheRide solidify the boundaries on third party payer programs in collaboration with each program's funder in the near term.

Why mobile ticketing?

Mobile ticketing has proven to be a successful way to convert cash riders to an alternative method of fare payment. While mobile ticketing tickets are typically purchased using a credit or debit (including prepaid debit) card, many mobile ticketing vendors are now offering ways for cash riders to purchase their mobile tickets and passes using cash at a transit center or through integration with an electronic cash transaction network vendor. While it will not address all barriers to mobile ticketing (i.e., rider still must have a smartphone), offering a way to purchase tickets and passes using cash solves one of the most significant barriers for low income riders.

Why smart card + mobile ticketing in an integrated system?

Though both standalone smart card systems and integrated smart card and mobile ticketing systems require large, up-front investments, all combinations of smart card and or mobile ticketing may result in lower operation and maintenance costs depending on the selected solution and penetration rate. Smart cards are less expensive to operate and maintain than magstripe and cash systems because they are entirely solid state; mobile ticketing systems require no infrastructure or a limited amount of inexpensive infrastructure (e.g. beacons). Both will help shift customers away from magstripe tickets and passes and cash, thereby reducing wear on the TRiM units and costs associated with printing magstripe passes and reconciling printed passes and cash. Additionally, the reduction in on-board cash received can extend the life of TheRide's fareboxes and possibly enable TheRide to procure less complex and less expensive fareboxes as replacements.

It should be noted that mobile ticketing will likely come with a 10% all inclusive transaction fee, and smart cards will come with a 5% credit card fee. While these fees do represent an additional financial cost to the agency, TheRide should compare these costs to the potential savings from reducing the cost of cash collection in terms of both operations and maintenance.

Integrating a smart card and mobile ticketing solution with a common Customer Relationship Management (CRM) system will allow TheRide to better support customers rather than managing two parallel fare collection systems. The common CRM could also be used to manage rider eligibility for low fare programs and to track customer interactions through phone calls, emails, and letters. Integration also provides customers with a seamless user experience and the ability to switch between media types.

Offering both smart card and mobile ticketing also gives more customers the ability to access the benefits of the new fare collection technology than would be able to access either one as a stand-alone system.

Mobile ticketing on its own, while in some cases a low cost solution that can be implemented quickly, provides only a fraction of the benefits of an integrated smart card and mobile ticketing system. Stand alone mobile ticketing applications offer limited options in terms of third party pass programs and would not inherently be capable of delegating management over these programs to transit coordinators at employers or other organizations. Very few of the current mobile ticketing offerings provide significant administrative capabilities. This is both because the industry is relatively young (compared to ride matching, for example) and because mobile ticketing is not inherently well suited to the types of fares generally associated with third party programs (lengthy period passes, or electronic purses with regular deposits). Adding these to the requirements in a solicitation would limit the number of vendors capable of responding and/or increase the capital cost due to non-recurring engineering costs.

For those vendors that do respond, their cost quotes to build a mobile ticketing system that is capable of handling third party partners would be almost as expensive as a smart card system. There are two primary drivers of the expense. First, the accurate and lower risk handling of lengthy period passes such as monthly, semester or annual passes, requires real-time electronic validation. This involves both readers on board (NFC or barcode) and real-time communications such as a mobile access router. This hardware costs the same for a smart card or mobile system and is the lion's share of the cost of a smart card system. The second expense driver is a back-end capable of handling bulk transactions, such as an upload of cards that are valid for the next semester or cards that are no longer valid. This along with administrative capabilities for the back end, through which a single person can manage multiple accounts, are not common features of a mobile system. Again the cost is the same as for a smart card system. With these capabilities the system capital costs would be the same for a smart card and a mobile ticketing system.

Since many employers and schools already use contactless IDs that could be used as the identifier for a smart card system, a smart card system is preferable to a mobile ticketing system capable of handling third party partners. Additionally, since mobile ticketing requires riders to have a smartphone, an integrated smart card and mobile ticketing system is fairer as it allows all riders to access the benefits of the improved fare collection technology regardless of smartphone ownership.

If the procurement of an integrated system is not possible, a valid option would be to continue to use the existing mag stripe system for third party partners and then add a mobile ticketing system without third party capabilities. This would be much less expensive, but would not support off board validation or a significant expansion of the third party programs, particularly employer programs. It would however provide a convenient option for less frequent riders and may capture riders who currently pay cash, load change cards for future use, or pay using tokens.

Fare Enforcement

Recommendation: Shift enforcement to offboard

We recommend that TheRide shift enforcement for reduced fare programs offboard by determining eligibility at the time of purchase and not at the time of boarding. This policy change would address a number of issues that were identified earlier in this project by TheRide staff.

This policy change would remove the burden placed on operators to memorize all the types of fare discount IDs and the looks and discount levels associated with each. During conversations, operators indicated that not only is it difficult to memorize each of these IDs, it can also be difficult to read the details on the IDs once the cards are presented. Some IDs become worn over time and make the writing on the cards, such as expiration dates or names, difficult to discern. Additionally, offboard enforcement would reduce rider/operator conflict and shift operators to more of a customer service role. Many staff members expressed a desire to shift operators to a customer service role as a way to make bus service more inviting to current customers and as a way to attract new riders to the service who may be unsure of how the system works.

Offboard enforcement, because of the technology improvements it requires, would simplify administration of discount fares, including the deactivation of lost/stolen cards and the monitoring of suspicious discount fare use. Staff and operators alike are currently worried about fare evasion; publicizing the ability to control discount fare use would help assuage these concerns and minimize the perception of fare evasion on TheRide's services, which in itself can hurt the agency's image. The new technology required for offboard enforcement would also enable TheRide to assign eligibility to rider accounts that expires after a certain amount of time (e.g. youth or temporary disability).

Offboard enforcement policies and technologies would enable TheRide to obtain better data on discount fare usage rates and prevalence, creating a trove of information that would serve as a better resource for planning and financial analyses into the future. This would represent a significant improvement from the status quo regarding discount fare data. Conversations with staff and operators as well as analyses of farebox data compared to survey data show that operators quite often press the wrong key when recording a discount fare rider boarding, meaning TheRide likely cannot currently rely on its farebox data for accurate discount fare use information.

To enable the technology benefits named above, offboard eligibility enforcement is best done using an account-based smart card system. TheRide could choose to place names and/or photos on the smart cards tied to a discount fare account as an extra layer of enforcement if desired. To address equity concerns and protect sensitive personal information, it is recommended that TheRide document in its policy and ID card distribution instructions that only first initials will be placed on these cards if the agency does choose to print names on them. This practice could also help reduce the discomfort of transgender riders who do not identify with their given first name, and has already been informally implemented by staff at TheRide for current Fare Deal ID cards. (TheRide could choose to implement this part of the policy recommendation with or without the change to offboard enforcement and begin printing all future Fare Deal ID cards with only a first initial.)

As mentioned in the options overview in Part 1, the level of financial investment necessary to enable offboard enforcement would depend on the number of offboard sites available for distribution of the reduced fare media, the details of the technology, and whether riders' photos were printed on the cards. Based on the decisions made related to each of these considerations, the capital cost for a reduced fare media distribution network could range from a few hundred dollars to a few thousand dollars per location. Considering that TheRide currently handles almost all of its reduced fare ID distribution at AAATA Headquarters without too much of an issue, the agency could probably function with just the one central reduced fare media distribution site, which would minimize the required capital investment costs. TheRide could then explore alternative distribution locations to help accommodate high-volume application times, such as before Art Fair each July. The supplies used to set up these temporary locations could also be used during the debut of the new smart card reduced fare system to help process current reduced fare ID card holders into the new system.

A number of transit agencies have used the implementation of smart card technologies as an opportunity to shift fare enforcement offboard. The potential for offboard enforcement is even regarded within the industry as a driving factor behind agencies' decisions to implement smart card technology, and in general smart card implementation combined with the switch to offboard enforcement is strongly recognized as an industry trend. In the San Francisco Bay Area, the debut of the Clipper card coincided with a shift of youth fare enforcement to offboard; bus drivers no longer ask to see an ID upon boarding for a rider to receive a youth discount fare when a Clipper card is used. AC Transit also coordinated its smart card implementation with shifting its youth program enforcement offboard. RTD in Denver enforces all of its pass programs and associated discounts through its MyRide smart cards and an accompanying offboard enforcement program, and CTA in Chicago does the same with its Ventra smart cards.

Third Party Pass Programs

Recommendation 1: Do not incorporate discounts into pricing of per-ride rates for pass programs; this is not common industry practice

It is very uncommon for transit agencies to incorporate reduced fare discounts into third party payer agreements. The only exceptions to this are third party payer programs where all program participants are eligible for the same reduced fare, such as with the Exceptional Pass program. To better align itself with industry standards and to create greater consistency across third party payer contracts, Four Nines recommends that TheRide eliminate the reduced fare discount from all third party payer program rate calculations except Exceptional Pass. This means contract pricing would only incorporate a transfer rate discount, ideally specific to each third party, and a bulk purchase discount, which is currently set at 10%. This policy should be codified within the formal fare policy documents recommended in the next section of this document to give the policy permanency and to insure it is followed in future contract negotiations.

If TheRide decides to eliminate the seniors 60-64 discount, this would be an ideal time to make the contract rate pricing change to current programs since the reduced fare discount rates for MRide and

go!Pass - the third party payer programs currently benefiting from a reduced fare discount - would change anyways. The new contract pricing, as outlined above, would include only a transfer rate discount and bulk purchase discount. Assuming the current transfer rate discounts stay the same, the new pricing would increase the MRide rate from $1.19 to $1.22 and the go!Pass rate from $1.03 to $1.13. Using ridership numbers from FY2017, this would have increased the MRide contract amount from $3,011,784 to $3,087,711 and the go!Pass contract amount from $2,606,838 to $2,859,929. These are not insignificant increases in contract amounts for these entities, and TheRide may experience pushback from the University of Michigan and the Ann Arbor DDA when implementing this recommendation. It is important though to recognize that by writing this policy into formal fare policy documents that will undergo review and approval by the Board, TheRide demonstrates that this change to contract pricing is founded in forward-thinking that considers the agency's financial health, that seeks to remove any perception of arbitrary negotiation of contracts, and that thus opens future possibilities to introduce new third party pass programs. TheRide can fall back on this agency-wide consensus and the weight of having these changes codified within a formal policy if negotiations become difficult. Other transit agencies across the country have had to go through similar contract renegotiations with third party payers. AC Transit renegotiated its contract with UC Berkeley to comply with their adopted pass program policies. This was also critical in helping the University explain the changes to the student body, who were required to vote on changes to student fees associated with this program. RTD in Denver is currently in the process of reviewing its contracts with local institutions as part of a holistic review of their entire landscape of pass programs. In all cases, change will result in difficult negotiations because any change from the status quo creates perceived winners and losers. TheRide's key tools in approaching this change will be strong justifications for its decisions, which policies and analysis can provide.

If TheRide decides it is not in their best interest to remove reduced fare discounts from the MRide and go!Pass contract rates, Four Nines still recommends that TheRide document this policy going forward and adhere to it in pricing any new third party payer contracts. This will remove some uncertainty around pricing new programs by letting organizations interested in a third party payer contract as well as TheRide staff know what to expect. If TheRide moves to smart cards, the data from these cards would help TheRide determine more accurate transfer rates, which would also contribute to greater certainty around contract pricing.

Recommendation 2: The MRide data agreement does not need any modifications unless the University would like to cooperate in moving to contactless cards

Because the MRide agreement is a substantial source of TheRide's ridership and revenue, Four Nines does not recommend any modifications to the agreement, besides the potential change to rate pricing outlined above, at this time. In the future, TheRide may want to discuss moving the the MRide program to the contactless capabilities already embedded in MCards, especially if the transit agency decides to move forward with a smart card program. The move would hopefully help TheRide obtain better data on MRide usage and create more consistency across rider experiences. If UM affiliates are familiar with the contactless card boarding experience, they may feel more confident in migrating to an agency smart card after their affiliation with UM terminates.

Recommendation 3: Develop a methodology for pricing new third party pass programs without pre-existing ridership data

We recommend that TheRide develop a methodology to establish third party pass programs that can be adapted to situations where ridership by employer may be difficult or impossible to assess. In the past, this lack of ridership data has made TheRide hesitant to bring in new third party pass programs because of concerns regarding the impact of new programs on agency costs and, related to this, an uncertainty regarding how to price the first year of the program. There are several ways in which peer agencies establish new third party pass programs that do not rely on pre-existing ridership data for an institution's members; TheRide could build on these examples to develop their own methodology for pricing new third party pass programs where little to no ridership data is available.

In the San Francisco Bay area, AC Transit established the EasyPass program for employers to induce ridership to employers or developments on bus routes with existing capacity. Their program is a Universal Pass Program, where employers provide passes for all employees in the defined pool regardless of current or anticipated use. The employer's cost is based on transit service levels, size of the participant pool (employees), and some pass production and management costs. In this way, employers pay an annual per-participant price which can either subsidize the cost of the pass to the employer (in part or in whole) or pass the cost on to employees as a group benefit. However, employees must provide passes for all employees in the defined pool regardless of current or anticipated use. The cost matrix AC Transit uses for pricing its employer pass programs is shown below:

		Number of Program Participants (Annual Price per Participant)				
		100-500	501-1,000	1,001-5,000	5,001-10,000	10,000+
Transit Level of Service	1	$134	$115	$96	$76	$57
	2	$120	$104	$86	$71	$54
	3	$104	$91	$77	$64	$50
	4	$90	$78	$69	$58	$48

These costs were developed using a Transit Level of Service (TLS) score that reflects the frequency and concentration of service that is available within ¼-mile of the worksite. Specifically, this TLS score incorporates two factors:

- Number of trips during peak morning and midday service,
- Then downward or upward adjustments to the score for less frequent afternoon service and unserved peak, short turns/modified service, and premium service

To calculate the TLS score for a specific potential employer, each bus line within ¼ mile of the plotted employer location is analyzed and given a point score based on the two factors above. The sum of the scores determines their TLS score, with Level 1 representing the highest service and Level 4 representing the lowest service:

- Level 1- 45 points or more
- Level 2- 25-44 points
- Level 3- 10-24 points
- Level 4- 1-9 points

If a score falls just inside or outside of a LTS by one point or less, the pass program coordinator at AC Transit has the option of making an adjustment to a Client's TLS that they deem appropriate, with final approval from the marketing manager. As transit service increases and a particular employer's TLS score changes, AC Transit renegotiates an employer's program costs.

Similar "Universal" programs exist at other agencies such as SamTrans and Caltrain, which provide employer pass programs that are based on employee counts rather than ridership or usage. For both of these agencies, passes are set at a per-employee basis, with a minimum cost needed to participate (based approximately at 100 employees). Employers pay an annual fee for every eligible user regardless of whether the users take advantage of the pass benefit. Their pass program also includes Residential Developments. How the employers of residential developments recoup their costs for the program is left to the organization.

TheRide could use a similar scoring program to those outlined above in order to create first-year pricing for new employer programs when no current ridership data is available. This type of scoring methodology prices programs in a defensible way that can be explained to new organizations while ensuring that the price covers the program's ridership and potential associated administrative costs. Establishing these types of pass program parameters also opens the opportunity to target more pass programs towards employers in areas where service may be rich, but still underused. Codifying the price methodology also provides the structure to ensure fairness between employers along with ensuring consistency in administrative functions associated with payment collection and pass distribution. While TheRide would still need to understand route-level ridership to plan where they would target more employer pass program market penetration, it would not be needed for their pass program pricing methodology if a pricing methodology similar to the examples above is established.

Recommendation 4: Expand business program (similar to go!Pass program) to other businesses in the service area located near transit service

We recommend that TheRide expand the business pass program in areas where it makes sense. Expansion of the business program could (1) help attract new customers to TheRide and (2) diversify the portfolio of pass programs bringing revenue into the agency, a concern that was expressed by staff specifically related to MRide pass holders accounting for approximately 40% of current local fixed route

ridership.

While it may be attractive to offer a pass program everywhere, priority should be for areas that already have rich service that is not currently at capacity. For areas that do not have transit service, or areas where the buses may be at capacity, it would be necessary for businesses to contribute to the cost of transit service in addition to any pre-established pass program costs. By strategizing in this way, TheRide can achieve economies of scale in their pass program without being hampered with additional service delivery costs. Should TheRide decide to expand into areas without existing transit service, it would be necessary to determine how costs of new service would be shared. However, we recommend keeping service related costs separate from pass program costs in order to avoid unnecessary complexity and confusion. Because service related costs are fixed based on the service provided, agencies often have a good sense of the cost-sharing arrangement that would be necessary to meet the financial objectives of the agency. For pass programs, on the other hand, agencies have wide latitude in determining the cost-sharing arrangement, based on existing capacity and service availability. Further, decisions related to service design and operations are rarely made with fare payment in mind. Creating a cost-sharing formula for new service allows an agency to investigate potential partnerships with businesses outside of the pass program model, at the same time understanding that it's rare that the revenue generated from a pass program would be enough to fund new service. While cost sharing arrangements for service or pass programs can be sequential, we recommend establishing a cost-sharing model for service outside of any cost-sharing model in the development of pass programs.

Formal Fare Policy

TheRide currently does not have any formal fare policy. As such, staff have no formal guidelines to direct them as they make decisions related to fares and no blueprint for implementing new and innovative programs and services or for integrating those new programs and services with existing ones.

Establishing a fare policy is one of the most significant ways an agency can take control of their future and establish good will with their customers. It can create an orderly, transparent, and rational process for fare increases, providing stability for riders and agency alike. Rather than relying on ad hoc fare decisions that do not adhere to any predictable policy and can lead to to rider anxiety or agency uncertainty, a comprehensive fare policy provides a clear trajectory for the agency that can be easily understood and followed by both internal and external stakeholders. A comprehensive fare policy can also support other agency goals and helps the agency remain compliant with regulatory mandates such as Title VI and ADA.

There are several good reasons for transit agencies to develop policies and fare tariffs:

1. It presents a single repository of fare-related operating procedures that can include everything from the amount of time that transfers are valid to the conditions under which a fare increase would occur.
2. It provides transparency to the public and the agency for issues that may be complex or open to multiple interpretations
3. It offers the agency discipline in establishing new fare products, discounts, or corporate

relationships so that all agency staff are working toward the same organizational goal.

Many agencies have a variety of documents that contain fare-related information, from board policies to operating procedures. The problem arises when new fares are established or when fares or fare procedures change, and it becomes necessary to change two or three documents in order for everything to be consistent. To combat this, many agencies have established fare tariffs—a codified fare structure—that delineates fare prices, fare media, fare-related operating procedures, and other fare-related issues. Valuable to riders and agency staff alike, fare tariffs can provide information on existing fares that can be used across a range of functions, from marketing to driver training. Fare tariffs can also contain information related to parking and transit center operations, or the establishment of Charter Service, insofar as they relate to fares and fare-related procedures. Many agencies have their codified fare tariff in their driver handbooks as standard operating procedures for the collection of fares, fare enforcement, and discount fare eligibility.

A comprehensive Fare Policy can include the rationale for and timing of fare increases as well as the more procedural elements of a tariff. This way all the fare-related issues can be kept within one policy document, eliminating the need to change other related documents that may exist within the agency along with the confusion and contradiction that can often occur when updates do not happen across the board.

Recommendation 1: Establish a fare tariff

Establishing a fare tariff takes time in order to ensure that all the conceivable elements associated with fare payment, fare enforcement, fare structure, and other fare related procedures are included. However, at the end of the process, the agency is left with a document that is useful to the agency and provides a solid basis for communicating fare issues to the public.

At the very least, the Fare Tariff should include:

- Fare Structure (media and ticket types, fare categories, discounts, rates, etc.)
- Fare Enforcement Protocol
- Transfers/Upgrades
- Pass Programs
- Specialized Discounts and/or Promotional Fares

As stated above, fare tariffs can also contain information related to any parking or transit center operations, advertising practices or the establishment of Charter Service, insofar as they relate to fares, fare-related procedures, or revenue-related issues. While the breadth and depth of the fare tariff can vary from agency to agency, the best fare tariffs are those that provide the most clarity to agency staff regardless of the department.

Recommendation 2: Establish a fare policy

A fare policy can be a few paragraphs, or it can be a comprehensive compendium of all fare-related items. One thing all fare policies have in common is that they anticipate the future and provide a blueprint for getting there by establishing principles and goals aimed at guiding the agency's revenue-related decisions. While these typically include broad pronouncements such as "Increase Ridership" or

"Improve Farebox Ratio," they also may include other more specific goals related to technology, partnership opportunities, equity, and the process for evaluating the need for fare increase. While goals included in a Fare Policy may be qualitative, such as "Fares should be easy to use," the principles may be more quantitative, such as "Price a monthly pass at 38 times the base cash fare."

Because a fare policy is typically adopted by the governing board, agencies strictly adhere to the policy; as such, the policy should be written with clarity and process in mind. This can be a double edged sword for agencies that have not considered the consequences of their proposed policies. However, if undertaken adequately, the fare policy can act both as a sword and a shield in fare-related internal discussions by providing context and content. It also helps to explain fare-related decisions to the public by framing the decisions within the context of the policy. Issues such as fare increases, new transfer policies, pass programs, or technology changes can be directly traced to the agency's overall goals and principles and therefore the decisions made regarding these issues better defended to external stakeholders.

Additionally, if the process for increasing fares is codified in the fare policy, there would be a standing expectation of the public and the agency board as to when increases would be considered. Some agencies have instituted multi-year fare increases within their fare policy that includes a "kill switch" based upon the financial health of the agency. If TheRide decides to institute budget-driven fare increases or fare increases related to internal indicators, the process for evaluating fare increases would be included in the fare policy along with the standards or conditions under which fare increases would occur. In all cases, standard protocols for outreach should be included in order to provide internal guidance to staff as well as to help the public understand how to become involved in the decision making process.

It should be understood, as previously mentioned, that a fare policy is only of benefit if the agency adheres to it. In fact, adopting a fare policy that is not followed may engender public mistrust, especially if the public was involved in drafting the policy. However, if done with sincerity, the fare policy can provide a structure and discipline to an agency by eliminating ambiguity within its fare structure and clearly stating goals and principles.