

Fare Coordination/Integration Study and Business Case

Appendix – Business Case Findings

Draft
September 2021

Appendix – Business Case Contents

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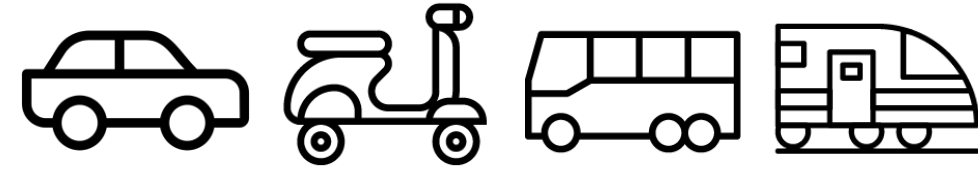
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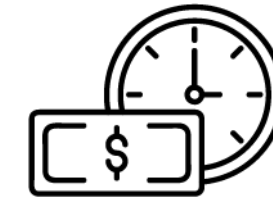
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Business Case Introduction

Network Model Overview



Network models consider all modes available to each traveler for a given trip



The model estimates the number of travellers who will choose each mode based on travel time (including reliability, wait times, access times, and time spent in vehicle) and financial costs (including fares, tolls, fees) for a given trip



The fare modeling approach holds all travel times constant but changes fares to determine how a new fare structure could lead to behavior change

What policy tools can be used to implement fare integration?

Price barriers, learnability/legibility, equity, and affordability can all be influenced through two types of fare integration policy changes.

1 Change how much customers pay for each trip

Fare policies can reprice trips to:

- Incentivize ridership in specific market segments
- Re-balance revenue across different user types- for example – today, customers paying double fares contribute a disproportionate amount of revenue compared to trips paying single fares

2 Change the amount of subsidy

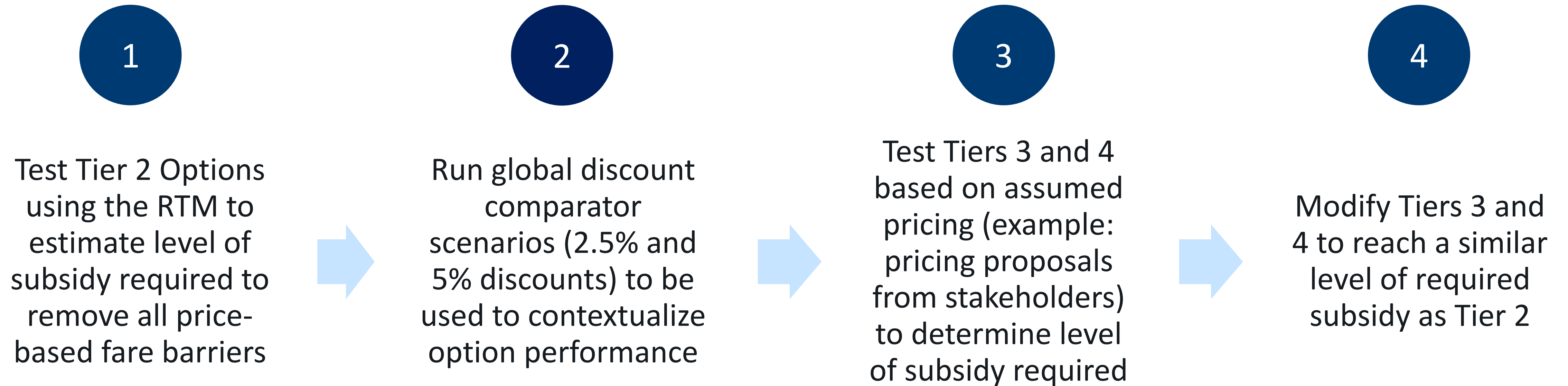
Decision makers can deploy additional subsidy to support fare integration:

- Replacing revenue lost from removing pricing barriers
- Supporting delivery of capital and operational changes required for integration

Throughout this presentation, comparator options of -1 to -2.5% and -5% to -7.5% fare revenue across the region are used to illustrate how direct investment in the existing fare structure compares to investment in the options.

Analysis Approach: Modelling Subsidy Scenarios (Tiers 2, 3, and 4)

A four step analysis process was developed to test each fare option:



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Tier 1 (Passes and Caps) Analysis

Tier 1 - Overview

Tier 1 Overlays is focused on caps and passes.

A range of passes and caps were modelled using a custom built elasticity model - this included:

- A range of price levels
- A range of trip levels (number of trips before a cap sets in)
- A single regional cap or product
- Tiered caps or products

This model uses pre-COVID Clipper data to explore the number of trips each 'card' made on each operator – either as part of a single trip or over the course of the month.

Elasticities were used to assess how different caps and pass products could impact ridership and revenue using the R programming language.

Because caps and passes were assessed with a different model than Tiers 2-4, they are discussed separately in this section.

This sub section includes:

- Overall findings
- Model outputs for:
 - Daily caps
 - Weekly caps
 - Monthly caps
 - Tiered monthly caps
 - An example 'Puget Pass' Style Product
- Recommendations for further analysis

Options Overview

Caps and passes can be defined based on the following:

- **Caps** – a product offer where customers receive a discount, or free travel, once a trip based or value based ‘cap’ has been reached
- **Value** – the dollar value applied to a cap or pass (example: \$50)
- **Trips** – the number of trips a customer could take before they receive a discount or free travel (example: 35 trips)

Tier 1 – Initial Findings

1

Trip-based products or caps tend to achieve as much ridership as a fare-based cap but with much lower revenue impacts.

2

Tiered caps (local service and all inclusive) generate similar levels of ridership but result in substantially more revenue loss. These are not recommended for further study.

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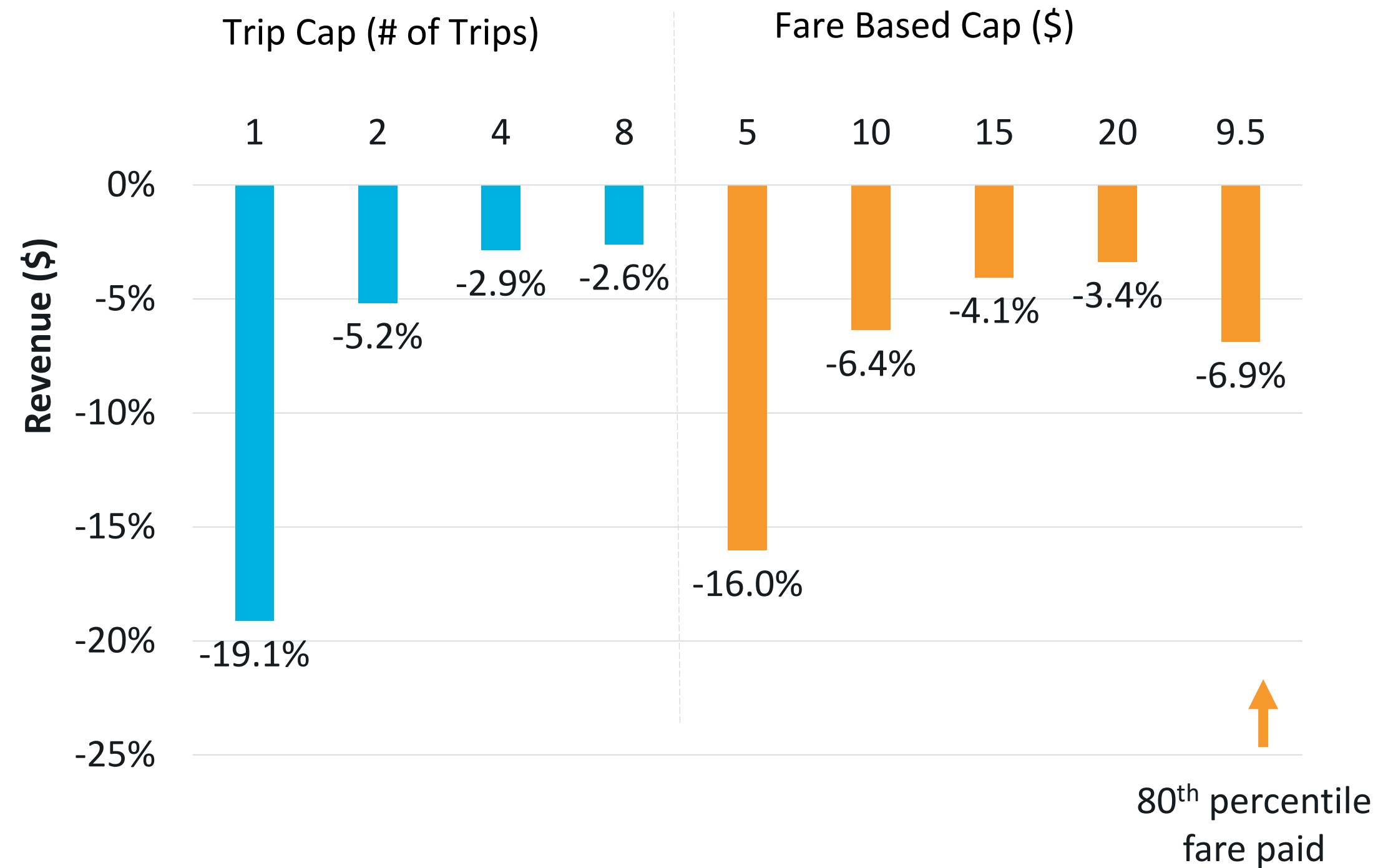
A **monthly product based on the Puget Pass** was modelled using Clipper data and included in the Business Case. In this scenario, a transit rider selects the value of their own monthly pass based on their most common/preferred trip. When using transit services that exceed this value, the transit rider only pays the difference in fare.

Daily Trip-based and Fare-base Caps

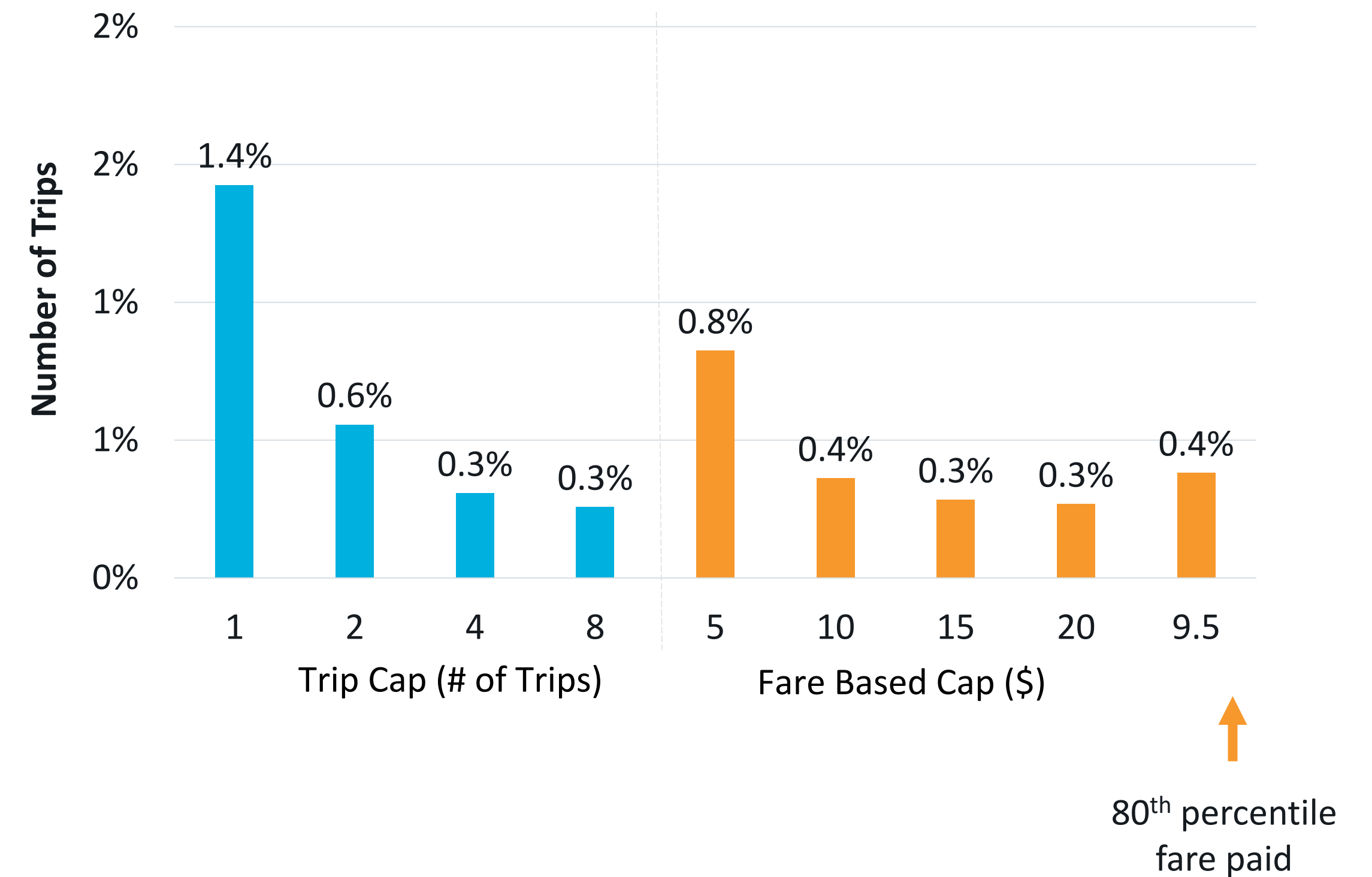
Trip-Based Cap

Fare-Based Cap

Change in **Daily** Clipper Revenue by Cap Type



Change in **Daily** Clipper Trips by Cap Type

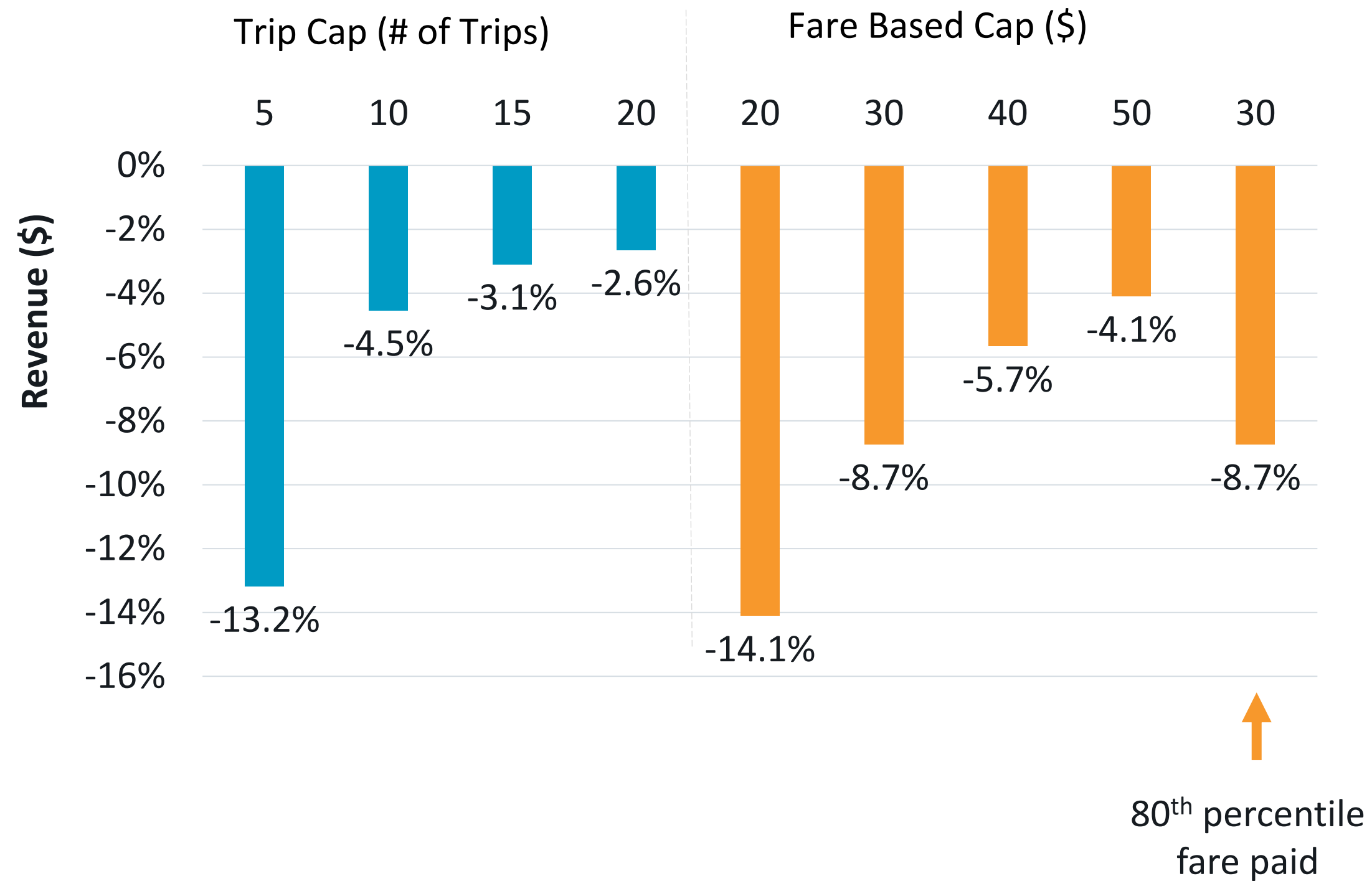


Weekly Trip-based and Fare-base Caps

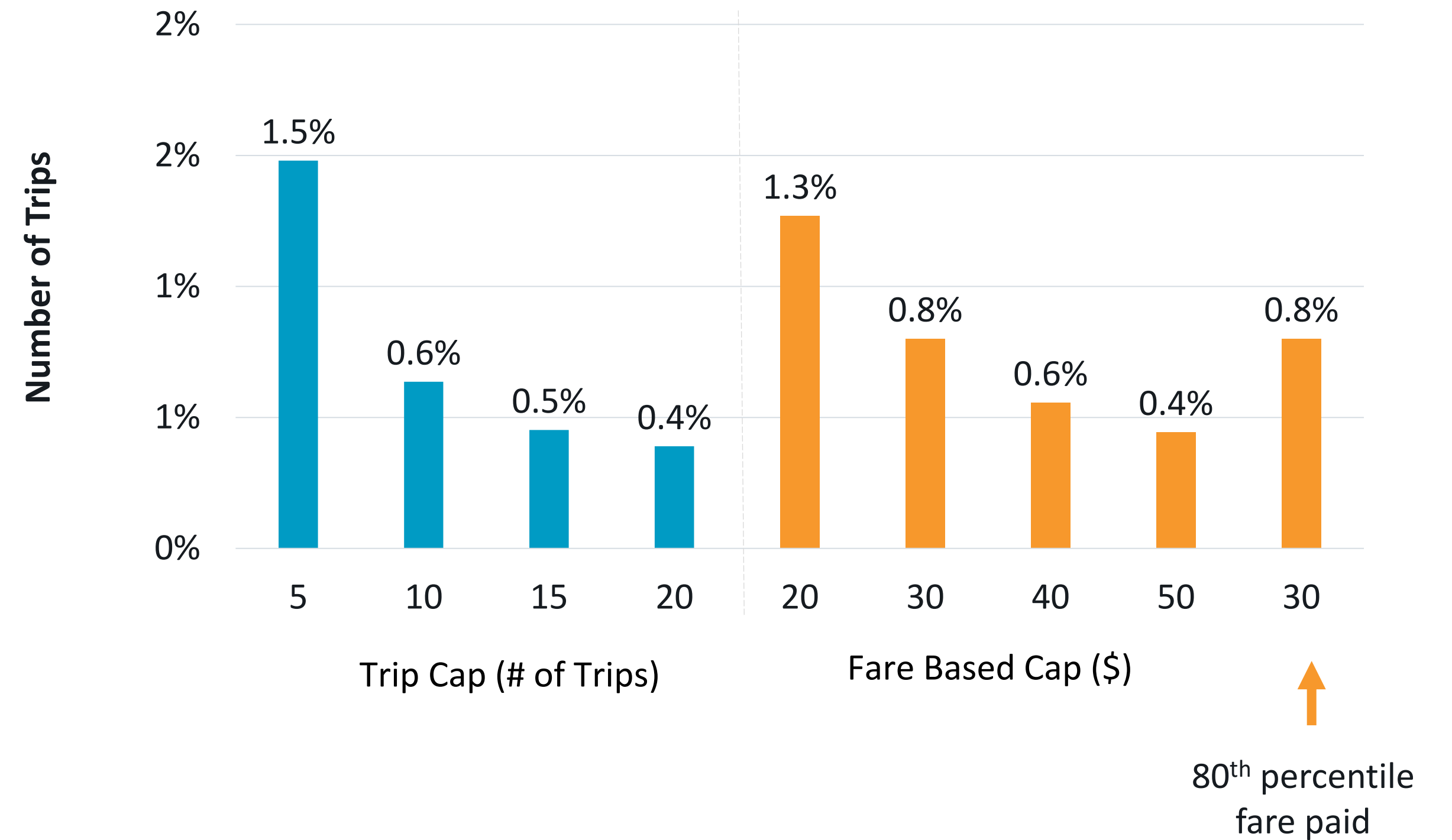
Trip-Based Cap

Fare-Based Cap

Change in **Weekly** Clipper Revenue by Cap Type



Change in **Weekly** Clipper Trips by Cap Type



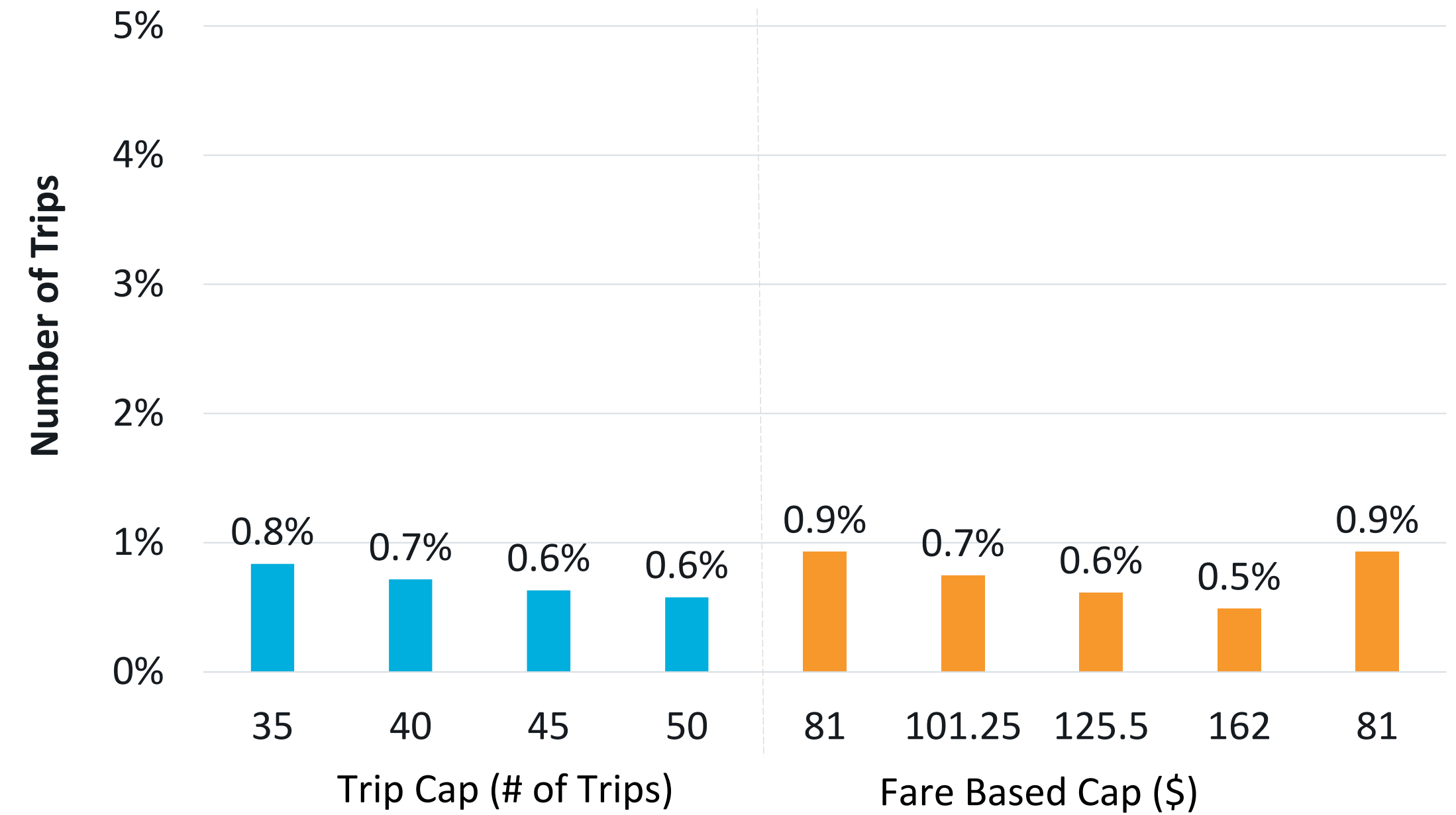
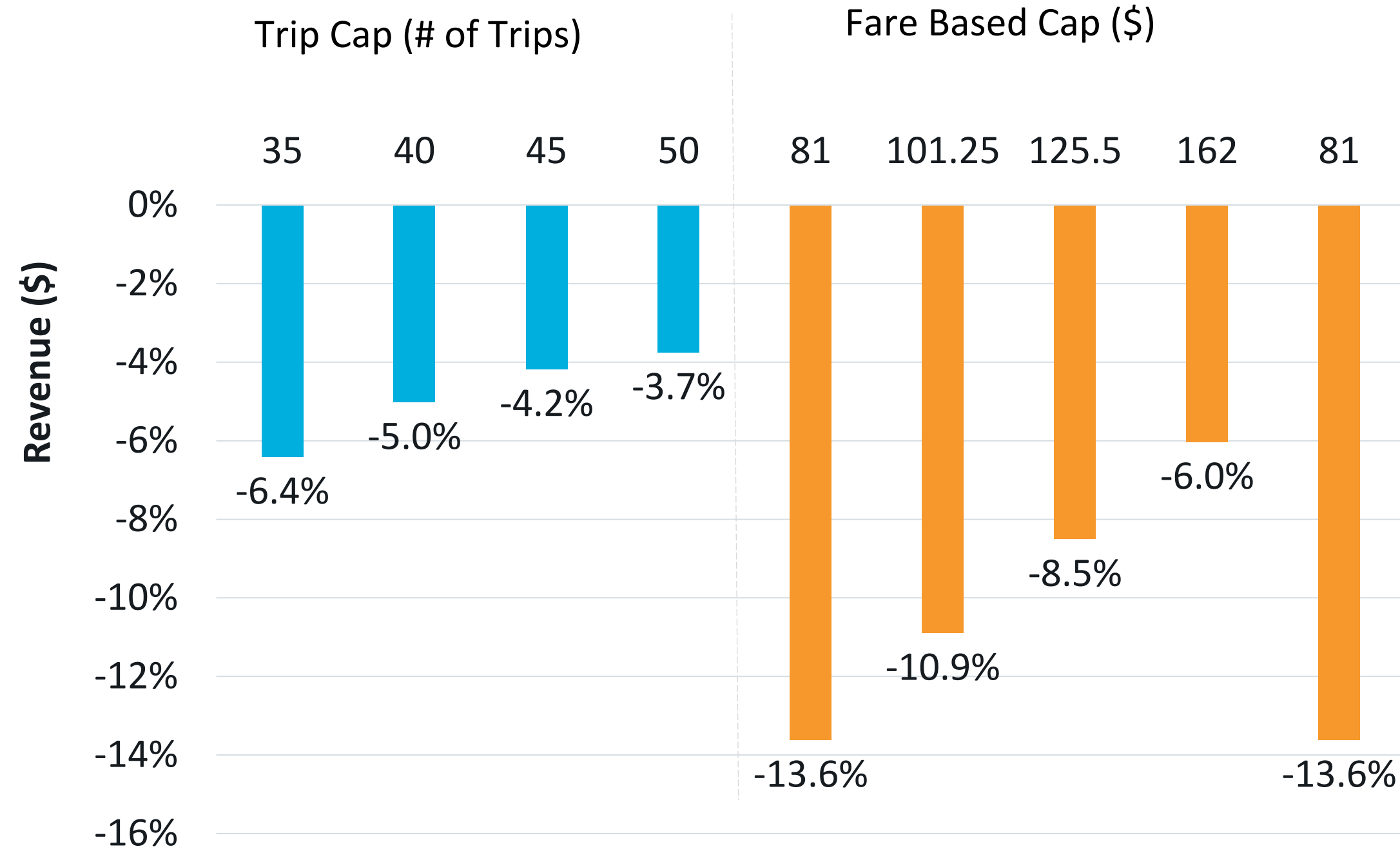
Monthly Trip-based and Fare-base Caps

Trip-Based Cap

Fare-Based Cap

Change in Monthly Clipper Revenue by Cap Type

Change in Monthly Clipper Trips by Cap Type



1

Trip-based caps generate similar levels of ridership with less revenue loss, most visible in the monthly comparison.

Puget Pass Styled Monthly Product

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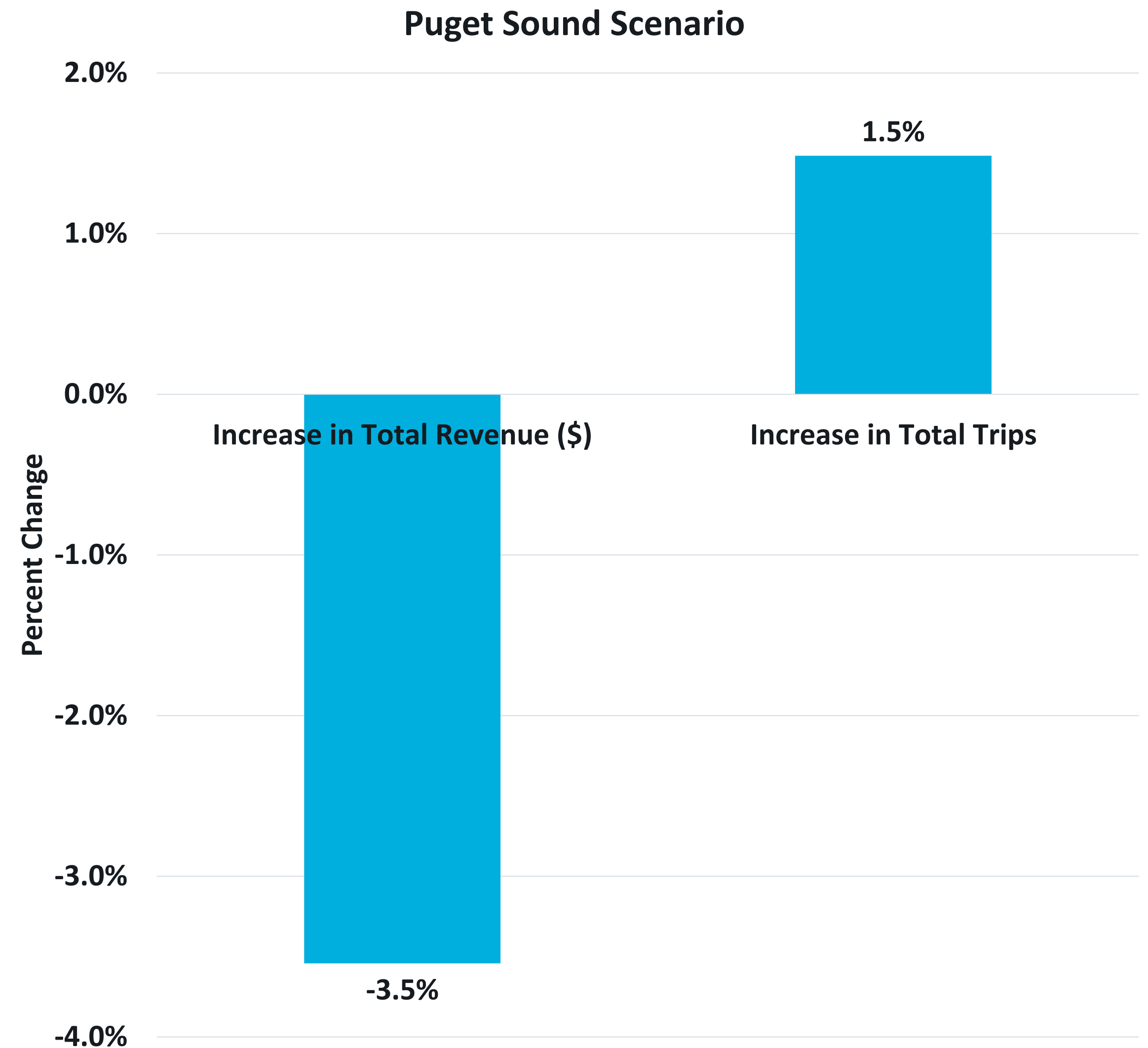
The Puget pass system allows the user to specify their most common trip, which is then capped at 36 trips. Transit riders only pay the additional fare for trips valued more than the most common trip.

Monthly Clipper data was used to model an approximation this product using two factors to determine the most common trip for each Clipper card:

- 1) most used transit agency
- 2) most common transfer pair

Additional fare is charged for trips that exceed this common trip amount. The transit rider pays the difference between the additional fare and the common trip value.

Based on comparative performance to value and trip based caps, the Puget Pass style product was included in the business case analysis.



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Business Case Analysis

Strategic Dimension – how do the options support policy objectives?

The **Strategic Dimension** evaluates each option based on the stated policy goals for Fare Coordination and Integration.

Four focused metrics, derived from the problem statement and broader local/regional/State policies, have been used to assess strategic performance.

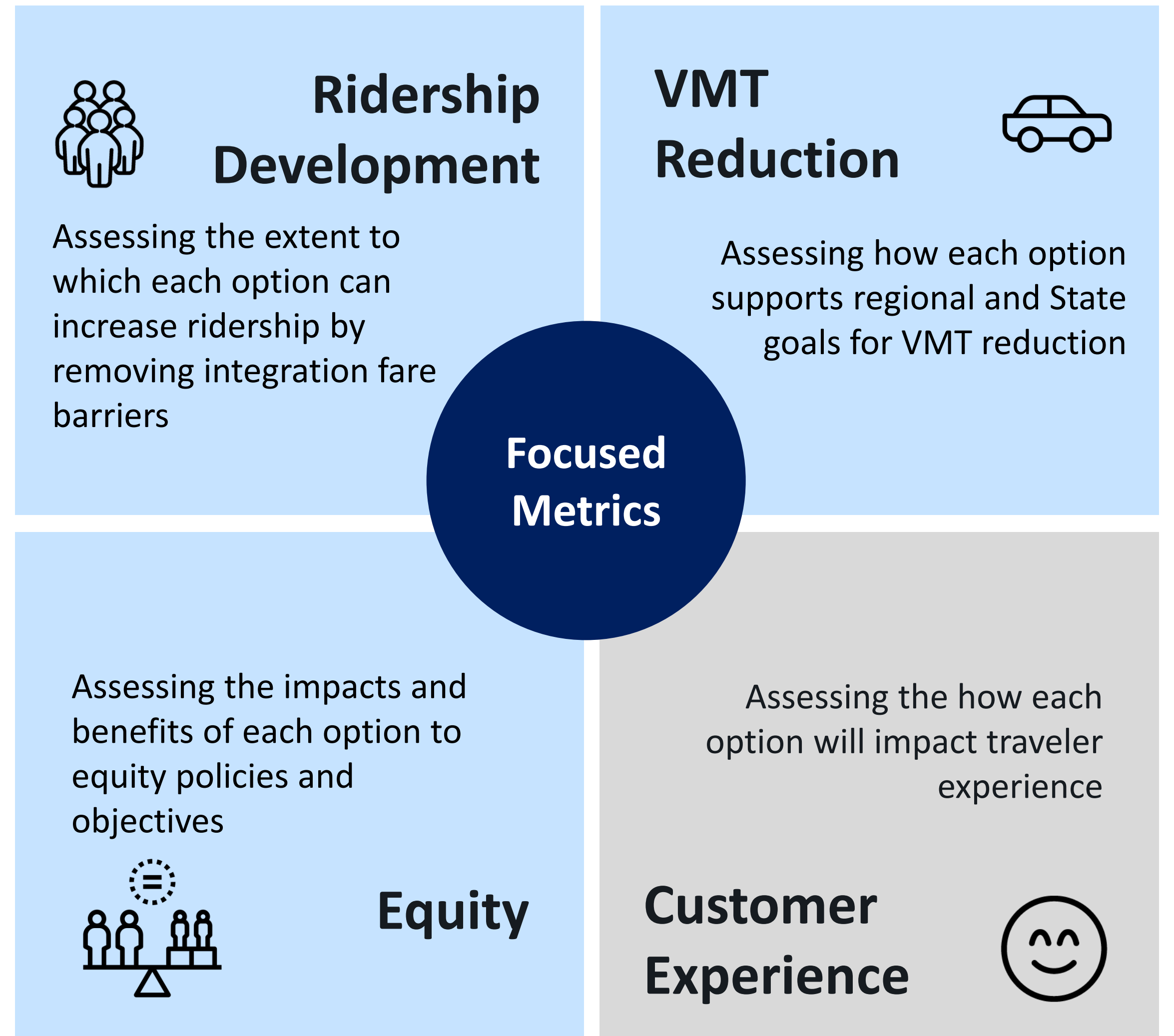
Combined these metrics answer the questions:

- *Can Fare Integration address the problem statement?*
- *What are the trade offs between options for addressing the problem statement?*

Legend

Analyzed with model

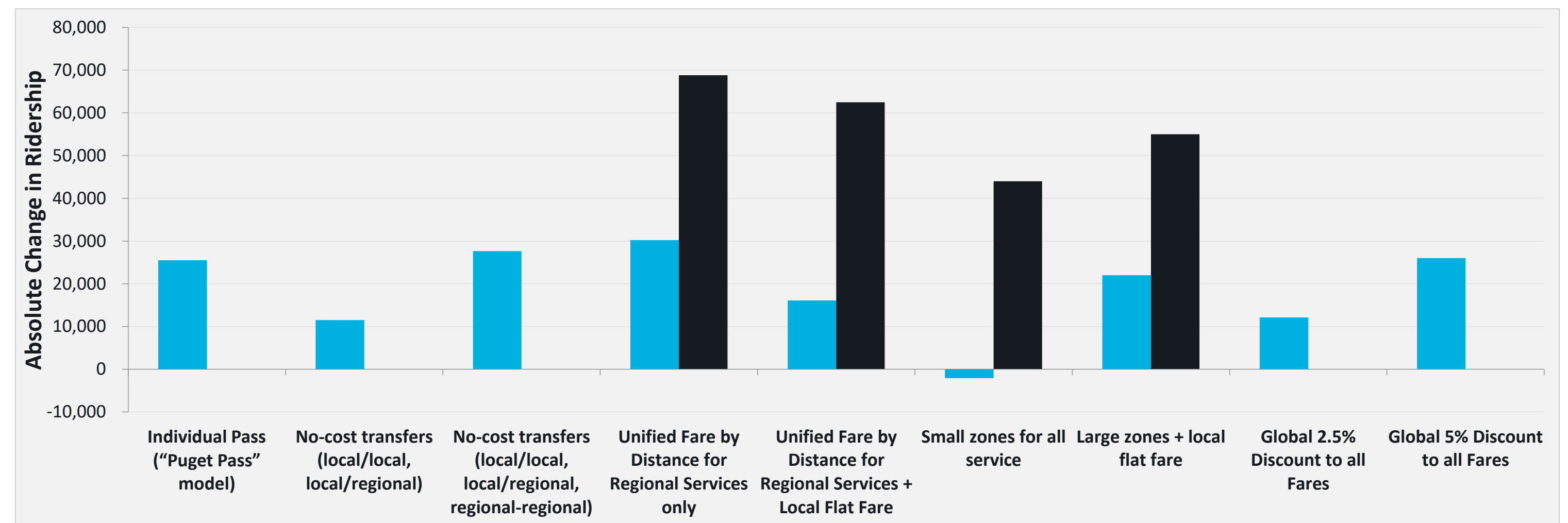
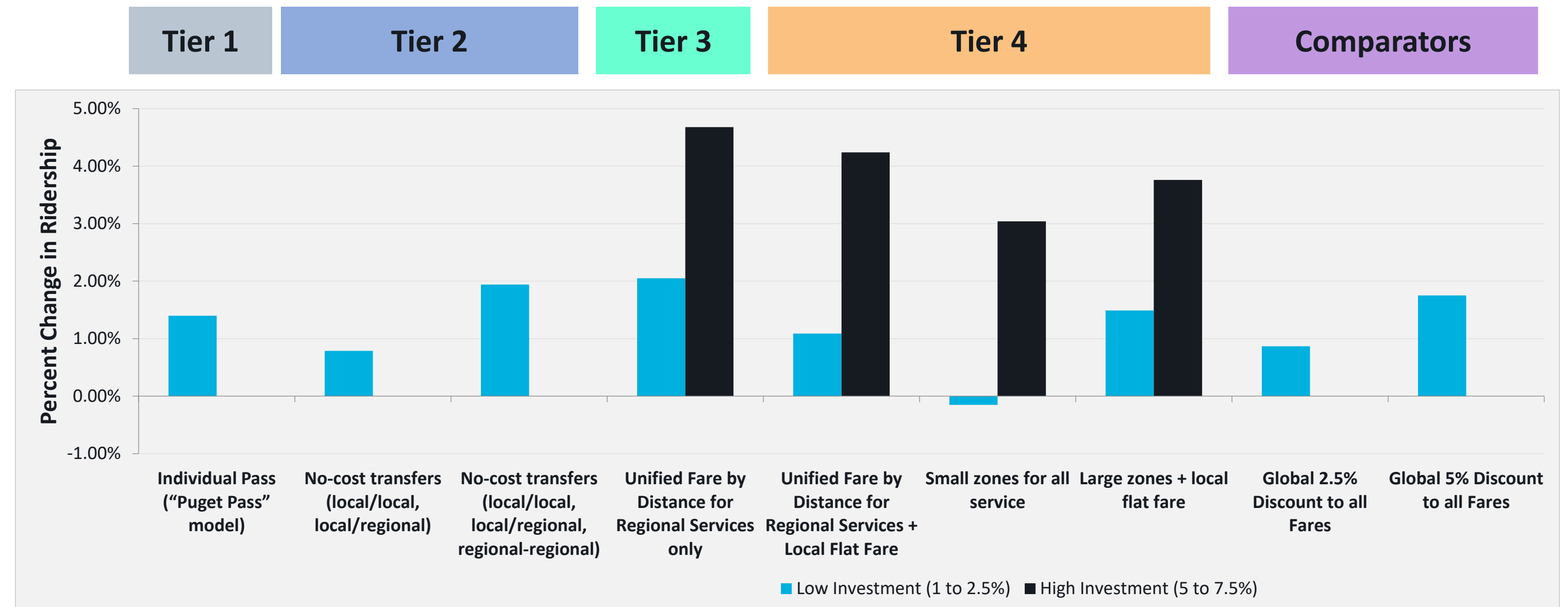
Analyzed with Customer Research



Strategic Metric 1 – Ridership Development – Bay Area Wide Perspective

The figures to the right illustrate overall ridership impact in the Bay Area at different levels of subsidy and notes the following findings:

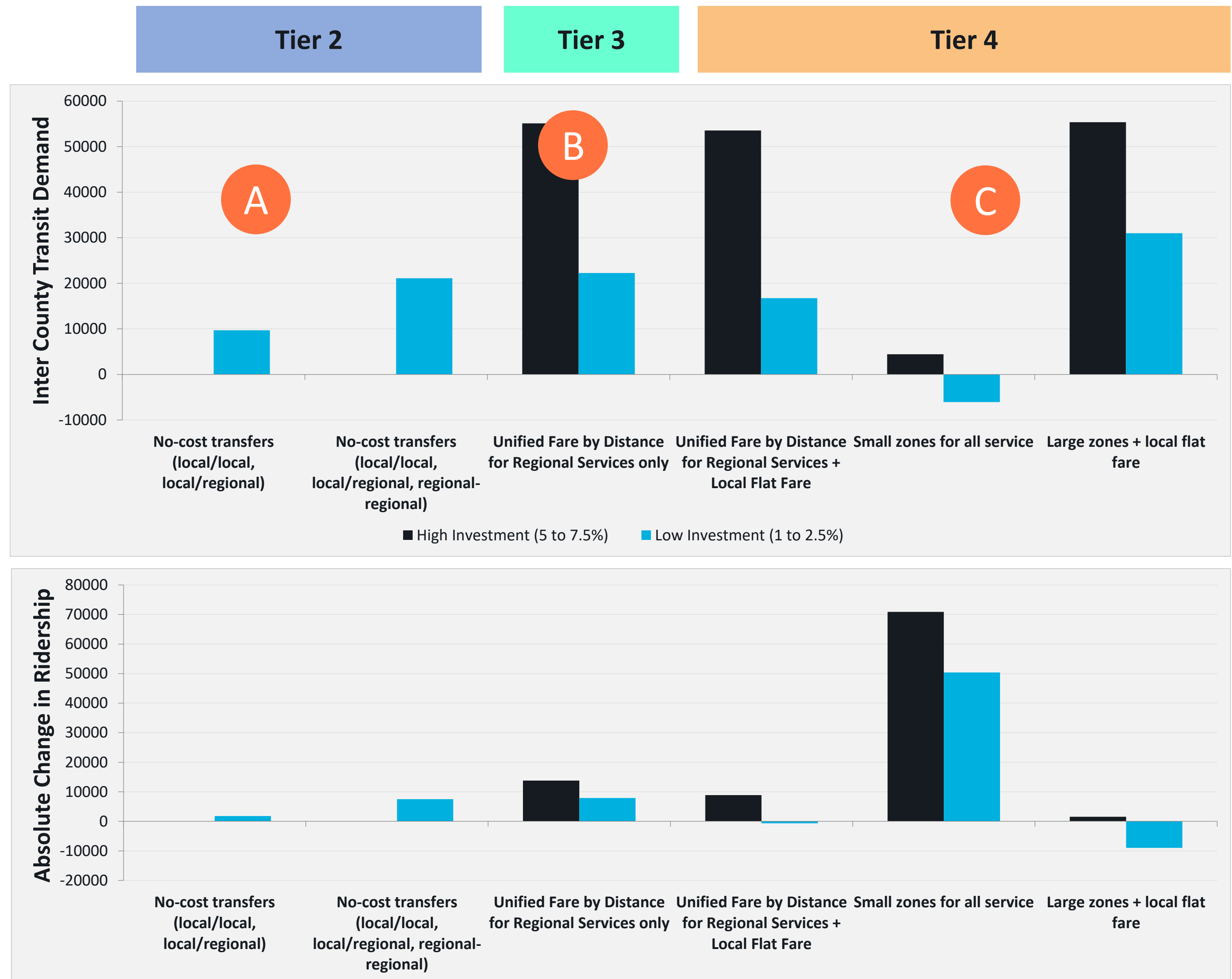
- Options in Tiers 1 and 2 only impact customers who face an integration price barrier and can generate between 0.75% to 2% more ridership with a low level of investment
- Options in Tiers 3/4 have greater ridership generation potential with higher subsidy with a unified fare by distance for regional services only offering the greatest ridership potential at high levels of investment and comparable ridership to no-cost transfers at low level of investment



Strategic Metric 1 – Ridership Development – Inter and Intra County Trips

Key Findings

- A** No-cost transfer options promote inter-county ridership (~11,000 to 25,500 passengers per day) with limited intra-county gains
- B** At a high level of investment, Tier 3 generates nearly 69,000 new riders per day of which 55,000 are inter-county trips, with low investment it can generate 30,000 trips a day of which 22,000 are inter-county
- C** At \$70m per year of new subsidy, small zones for all services generates intra-county/single operator ridership (~50,000 trips per day). This option loses ridership at lower levels of subsidy, and with high subsidy gains intra-county but loses inter county ridership



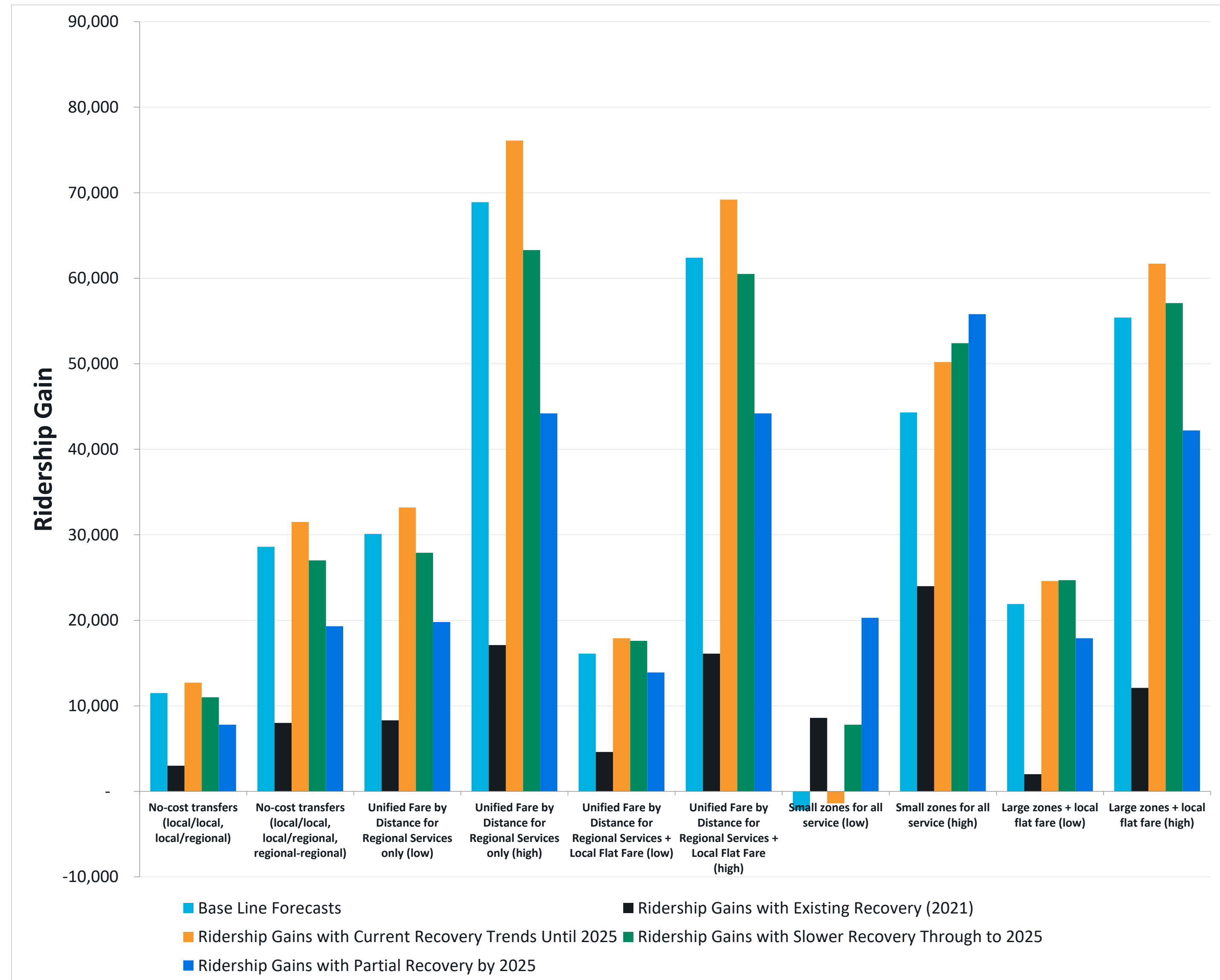
COVID Recovery and Integration Ridership

A set of COVID Recovery scenarios were developed to explore how different extents of recovery by 2025 could impact option ridership gains.

The figure to the right illustrates ridership gains for five scenarios:

- Baseline ridership forecasts (see previous slides)
- Ridership gains if the option was delivered with existing extent of recovery
- Ridership gains if recovery continued on a similar trajectory as today until 2025
- Ridership gains with a slower recovery (recovery rates are 50% what has been observed)
- Ridership gains with a partial recovery (no area in the Bay Area is 100% at 2019 levels by 2021)

This assessment illustrates that lower levels of recovery has more severe impacts to performance for options with higher intercounty travel (Unified fare by distance, large zones)



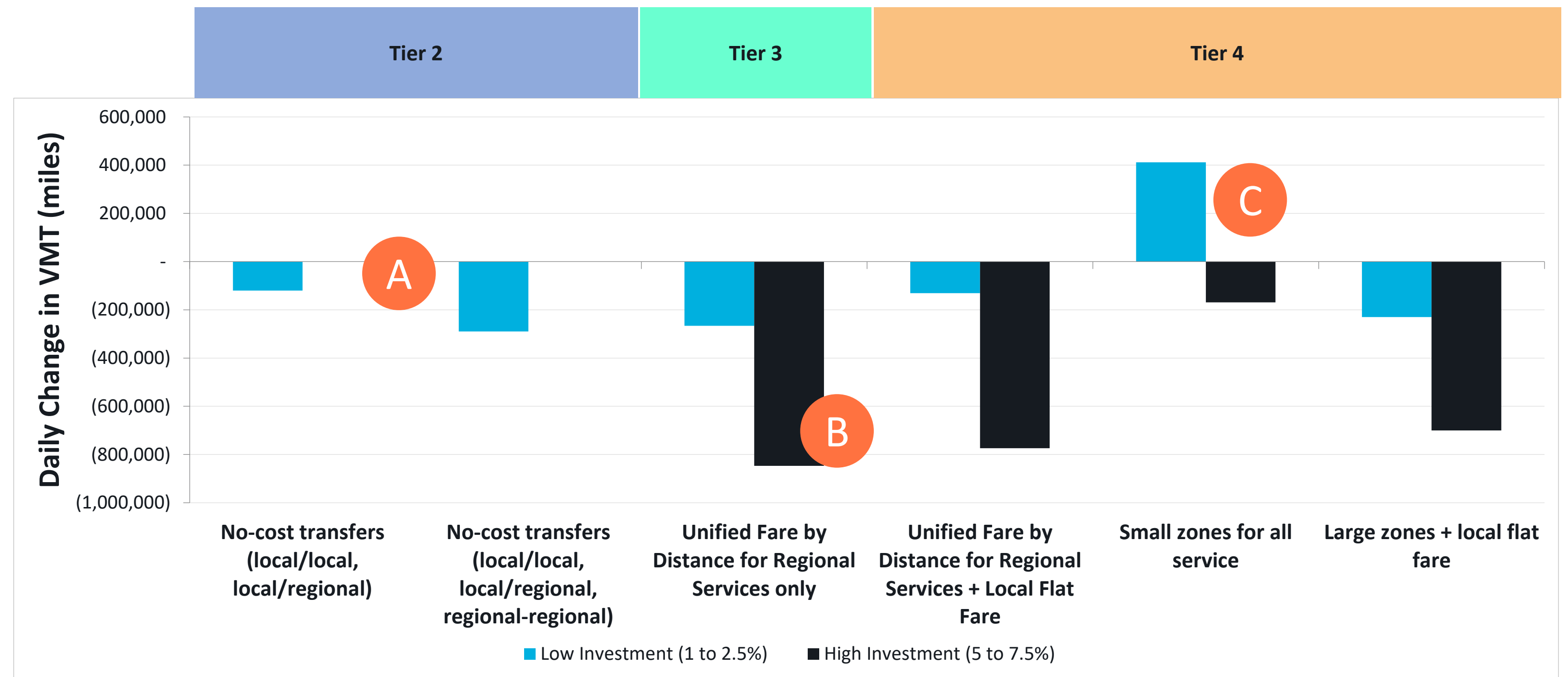
Strategic Metric 2 – VMT Reduction



Reducing **vehicle miles travelled (VMT)** is a key policy theme at the local, regional, and State level.



VMT reductions vary between options based on the types of trips that are generated by fare policy changes.



Note - Tier 1 - Individual Pass ("Puget Pass" model) was not included in this analysis as it was not modelled in the regional travel model

Key Findings

- A** Tier 2 and Tier 3 tend to have higher VMT reduction per new trip because the majority of trips are longer distance trips using a combination of regional and local modes
- B** Unified fare by distance options have the highest VMT reduction as their ridership growth is focused on the regional network and includes longer distance travel
- C** Small zoners generates mostly shorter distance Muni trips and has a net loss of ~6,000 inter-county trips, so its impact on VMT is lower

Strategic Metric 3 – Equity

The Strategic Business case focuses on the quantitative data provided by the TM 1.5 model outputs, specifically how travel behavior varies by household income groups:

- How would **new subsidy** be distributed between household income groups?
- How are **fare increases** distributed between household income groups?
- How are **fare decreases** distributed between household income groups?
- Do the **fare structures** change the modes used by travellers based on household income?

Equity implications of fare policy change are multi-dimensional. This study incorporated both quantitative and qualitative analyses to better understand impacts of fare policies on low-income and priority populations in the Bay Area.

These include:

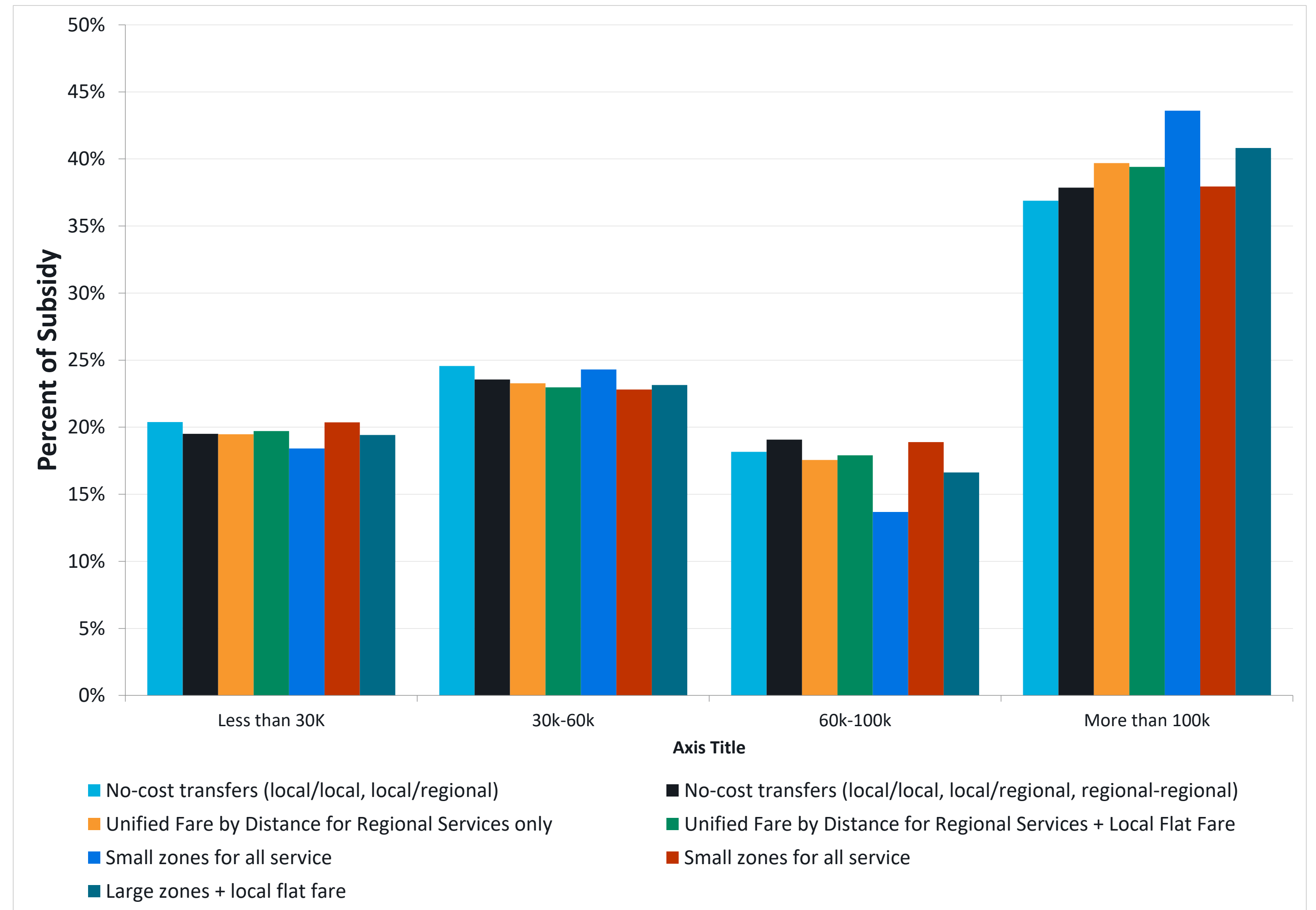
1. Impacts on costs/affordability and access to modes based on income data in the **TM 1.5 Outputs**.
2. Alignment or conflict with existing policies concerning equity in the region through **stakeholder engagement and policy review**.
3. Barriers to travel experienced by transit riders in the region expressed through **User Research**.

Strategic Metric 3 – Equity Impact (Share of subsidy: share of ridership)

Model outputs were analyzed to understand how dollars invested in lower fares were distributed among income groups.

The following general conclusions were identified:

- Level of subsidy invested in each income band only varies slightly between options
- Generally level of subsidy aligns with proportion of riders in each income category, with the exception of \$60k-\$100k, where investment is lower than the proportion of riders in this category



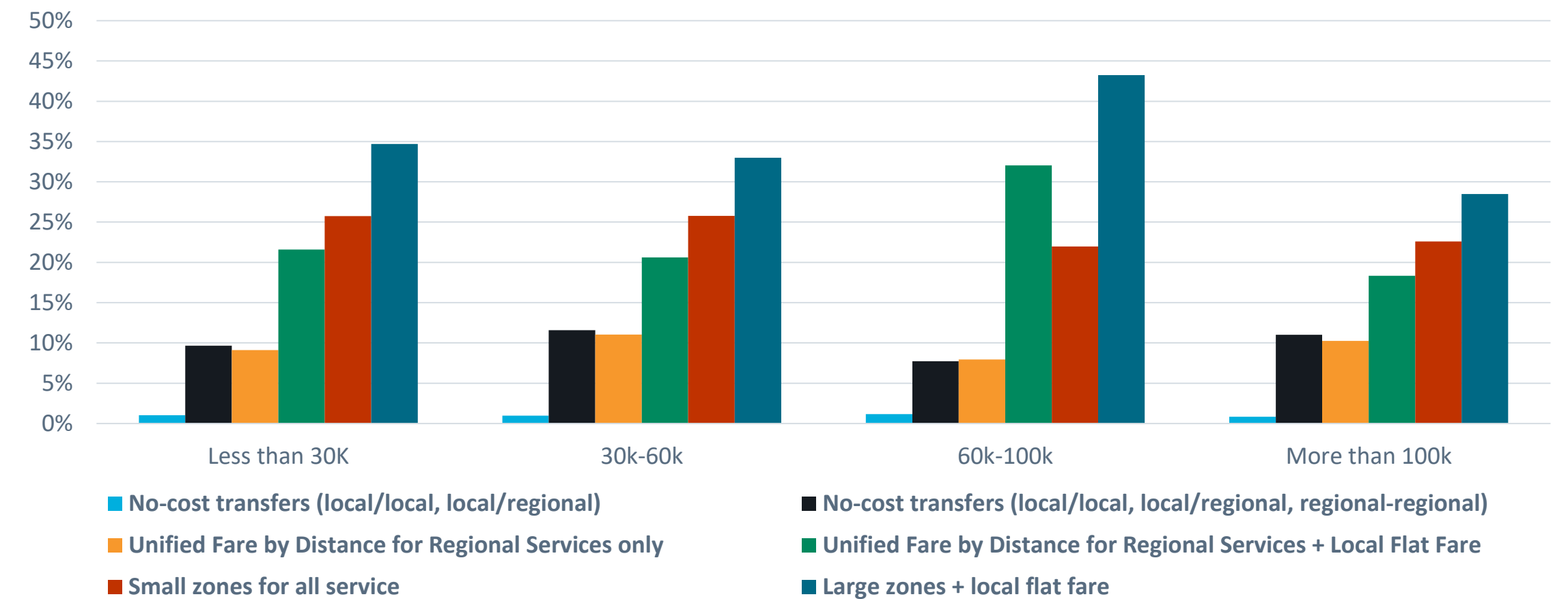
Equity Assessment: Fare increases across income groups

This assessment focused on the number of customers paying more under each option and their average fare increases.

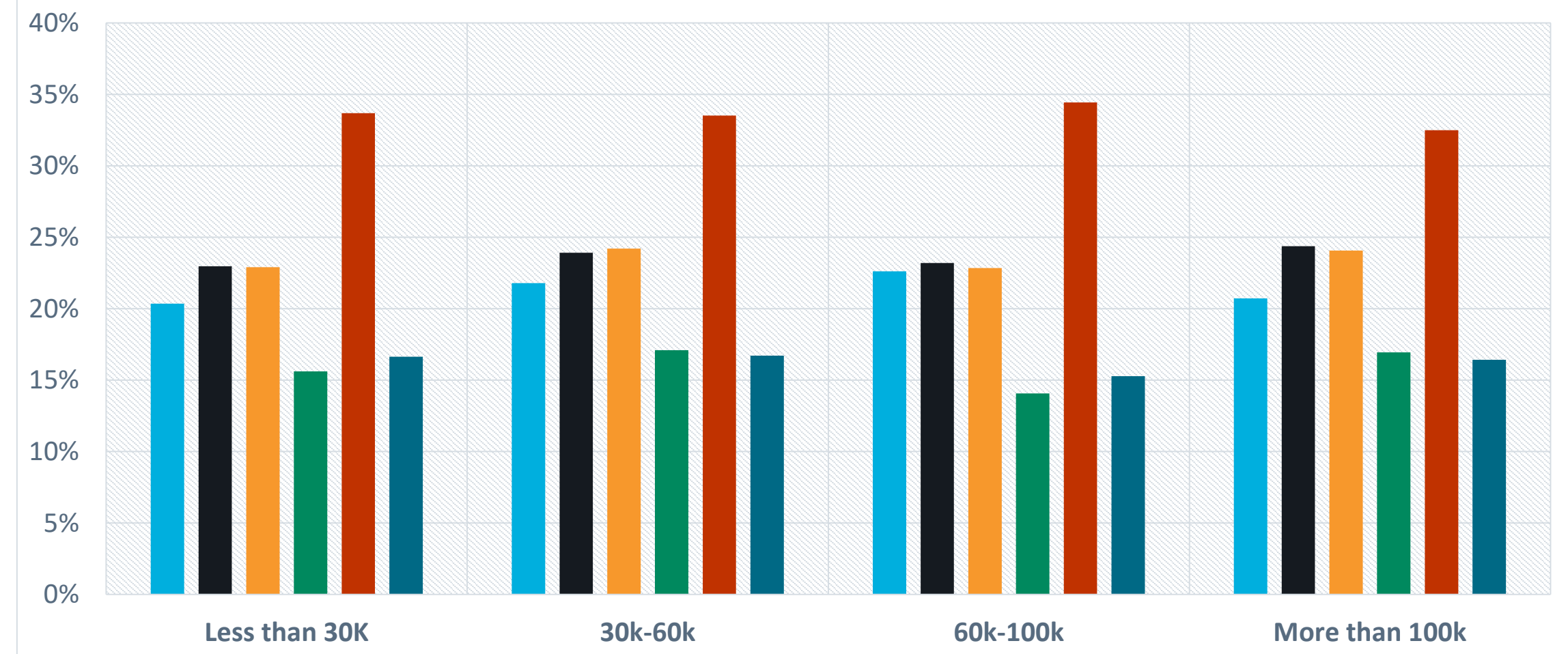
This assessment notes that:

- Tier 4 options tend to have more customers paying more, however unified fare by distance with a local flat fare and large zones with a local flat fare have lower average fare increases than lower tiers and small zones
- Tier 4 options tend to have more customers paying more in the lower income bands than the higher income bands
- Tier 3 results in fewer customers than Tier 4 paying more, with impacts that are generally consistent across the income groups

Percent of Riders Experiencing Increase in Fares



Percent Change in Average Fare Increases



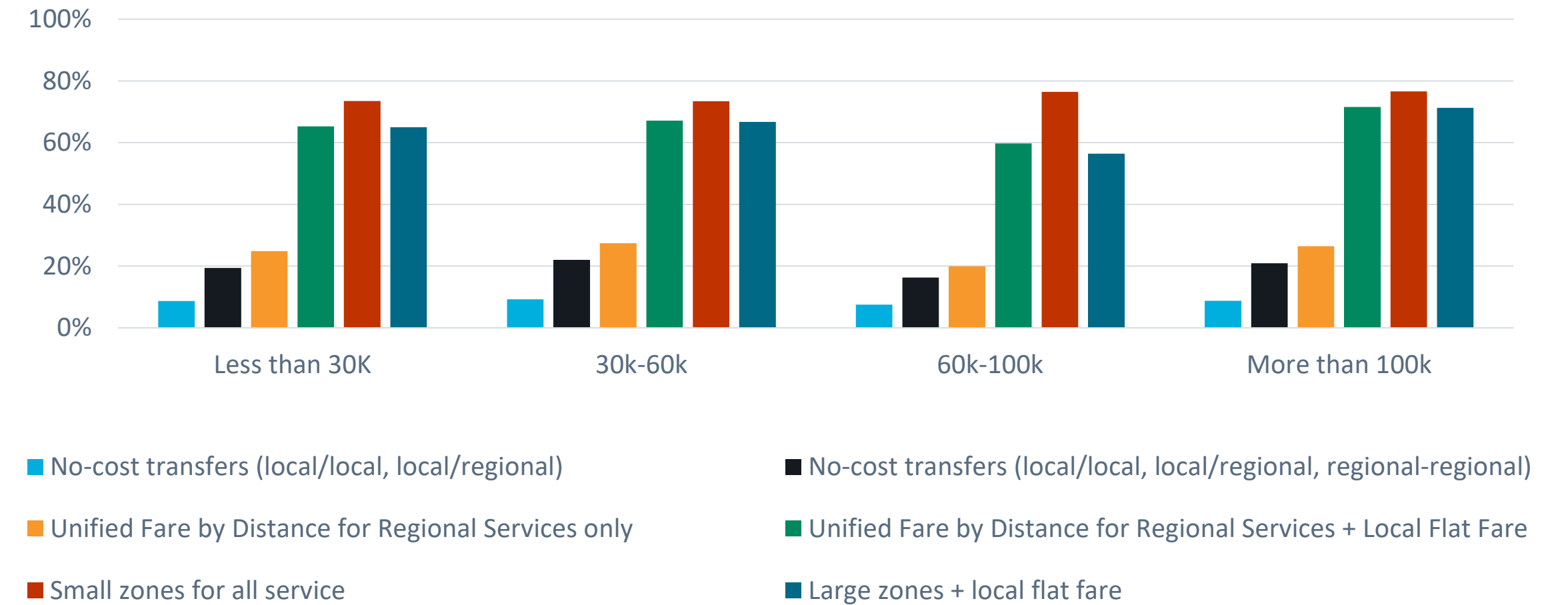
Equity Assessment: Fare decreases across income groups

This assessment focused on the number of customers paying less under each option and their average fare decreases.

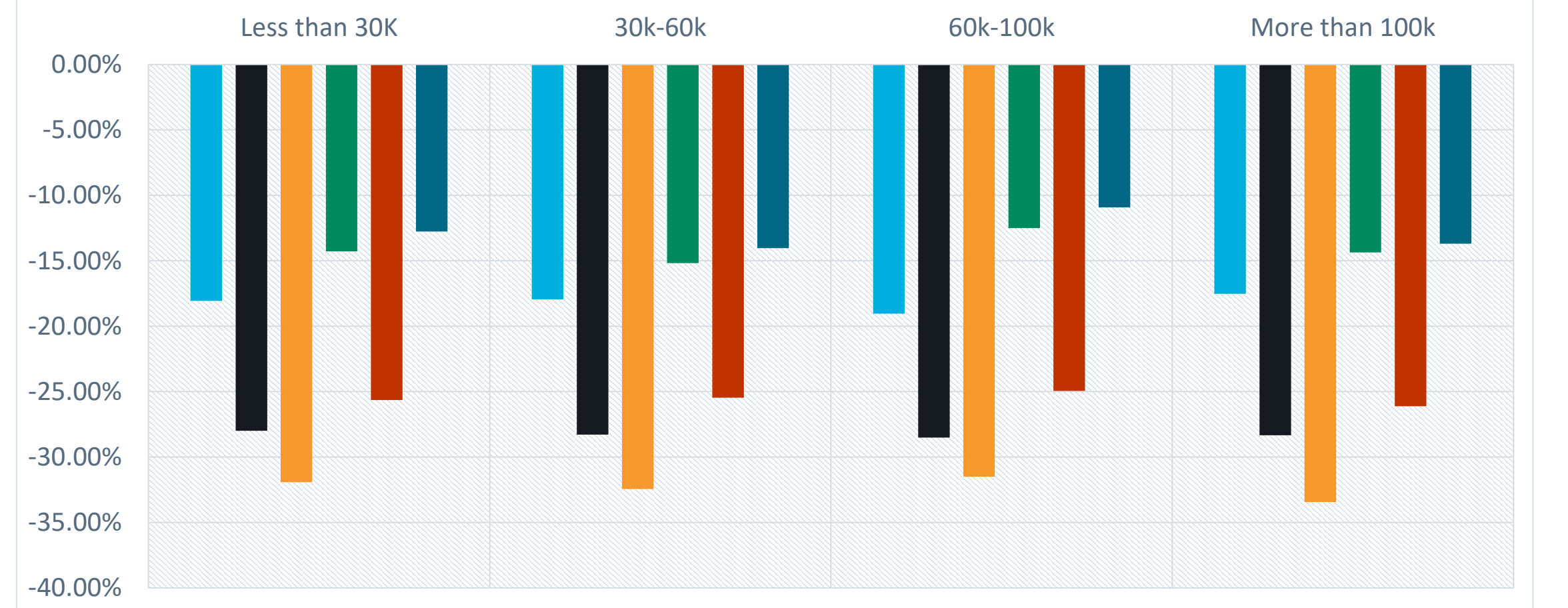
This assessment notes that:

- Tier 4 options tend to have more customers paying less, with the number of customers paying less equally distributed between income levels
- Tier 2 and Tier 3 have fewer customers paying less but offer greater fare reductions than Tier 4

Percent of Riders Experiencing Decrease in Fares



Percent Change in Average Fare Decreases



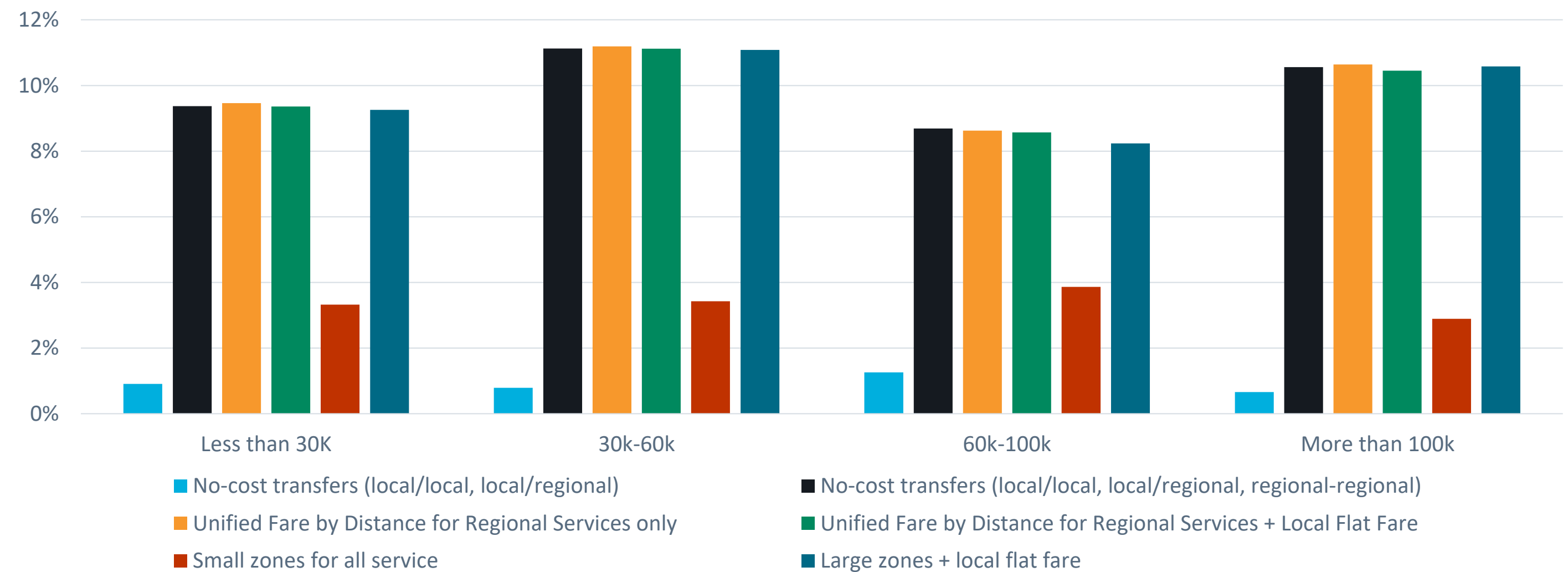
Mode shift across income groups

Additional analysis was conducted to understand how mode choice changed as a result of fare policies, specifically whether changes made rail services more accessible to lower income riders.

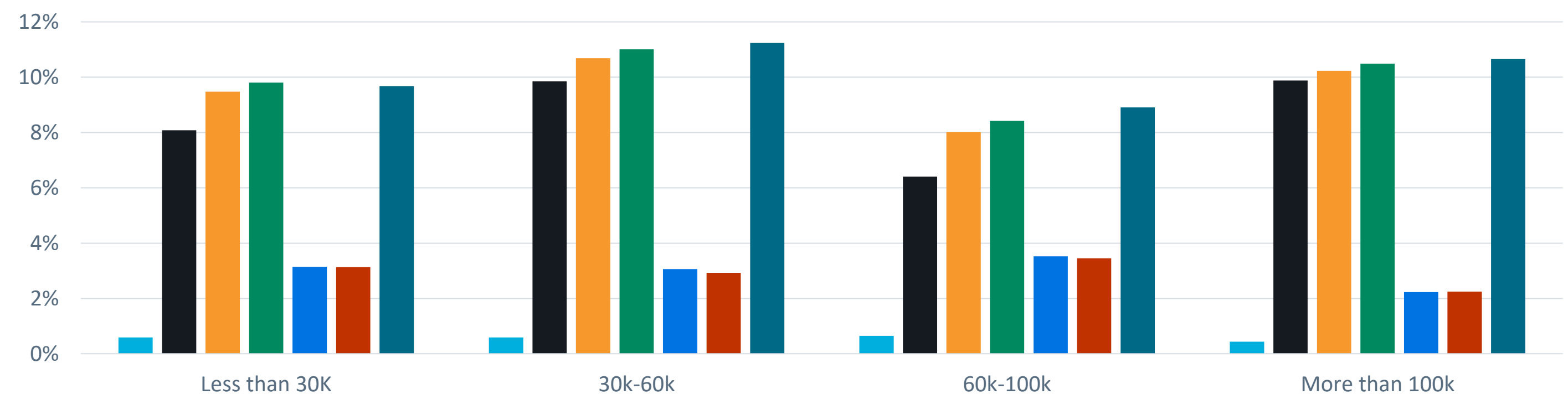
Key Findings

- For Tier 2, more people switched from using bus to rail than from rail to bus across all income groups.
- This pattern continues for Tiers 3-4, with the exception of the lowest income group.
- For options Tiers 3-4, the “Less than \$30k” were slightly more likely to switch from rail to bus (.01% to .40% more switching to bus).

Percent of Transit Riders Switching Modes (Bus to Rail)



Percent of Transit Riders Switching Modes (Rail to Bus)



Strategic Metric 4 – Customer Experience

The problem statement for the FCIS identified **customer experience** as a key integration barrier.

The FCIS team worked extensively with travelers to identify how this barrier impacts their use of multiple operators (either for one trip or for different trips over the course of a week/month) and how they perceived each option.

Customers were asked to review each option under a range of scenarios and provide rankings and qualitative feedback on its value, fairness, and legibility.

This metric synthesizes this customer research to define:

- The likely impacts that each option will have to traveler experience and traveler willingness to use multiple operators
- Key customer identified pros and cons of each option

1 Customer Experience - Overlays



Overall Lessons

For new or infrequent riders, this option may be easier to understand compared to other options as one rule applies to all services.

- Riders perceive caps as greater value than a pass, especially amongst those whose transit trips were random while passes were preferred when the travel routine was predictable and involved frequent trips.
 - Cap: Flexible, feel good about taking extra trips (over the cap) knowing they're "free".
 - Pass: Convenient, peace of mind, assume or expect a significant discount for paying upfront
- Riders' preferred cap/pass duration depend on how they plan and budget (e.g. weekly, monthly)
- Rolling duration for cap/pass maximizes its value, but can be challenging for riders to
- remember the start and end of the duration.

Value

- Good value as it always guarantees a discount of some sort

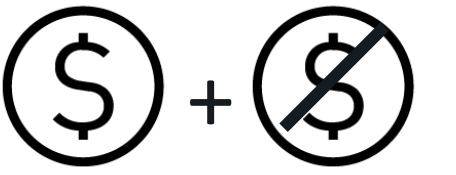
Fairness

- Deemed as most fair most often, including low-income participants.

Legibility

- Cap:** participants had issues understanding or had a different understanding of how caps work
- Pass:** while not as challenging as caps, some participants did misunderstand or have a different understanding of what passes offered

2 Customer Experience - Transfer Discounts



Overall Lessons

- Riders perceive value in getting part of their trip for free but may feel that the discount is small in comparison to the total trip cost (e.g. paying for a long trip on a regional service).
- While it can be easy to understand conceptually, it may not be easy for a rider to know what to pay unless they know which service is the most expensive.

Value

- Cap: value comes in free trips after cap and its perceived flexibility
- Pass: provides peace of mind, but deep discounts expected

Fairness

- Users did not provide specific input on fairness of transfer discounts

Legibility

- Conceptually easy to understand but may be impacted if in the future it isn't "only paying for the most expensive part of the trip"

3 Customer Experience - Regional Change



Overall Lessons

- While riders may find it fair to pay by mileage, they also feel fares may be expensive for long trips, even when there is a distance-based cap in place.
- With the cap, riders know their fare will not exceed a certain price, but fares for trips that don't reach the cap may fluctuate more based on distance changes.
- Framing transfers to local services as “free” gives riders a sense of value.

Value

- May feel expensive but cap and free transfers to local services are good value

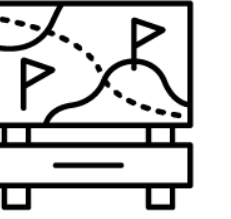
Fairness

- Deemed as most fair after no-cost transfers, but this view is not shared by low-income participants

Legibility

- Conceptually easy to understand, but will need tools to determine distance/price

4 Customer Experience - Regional + Local Change Zones on All Modes



Overall Lessons

- It is easy to understand and remember the price of fares for local services.
- There are concerns that the single flat fare is higher than current local service prices, making it unfair to some riders in the Bay Area.
- Framing transfers to local services as “free” gives riders a sense of value.
- While riders claim this option is easy to understand, they often don’t consider what happens for regional services or misunderstand that regional services are also a flat fare.

Value

- Good value for local-service-only trips, free transfers are good value

Fairness

- Concerns about local service fares increasing in certain areas

Legibility

- Conceptually easy to understand for trips only pertaining to local services, but erroneously apply the same rule to regional services

Customer Impacts: Summary

Tier	Option	Value	Legibility	Fairness
1	Caps and Passes	Generally positive	Mixed feedback – some passes may be more complicated to understand than others	Generally Positive
2	Unified Fare by Distance for Regional Services only	Generally positive	Generally positive, some concern about learning multiple fares and figuring out which one is discounted	Generally Positive
3	Unified Fare by Distance for Regional Services + Local Flat Fare	Generally Positive	Mixed feedback – stated need for tools to interpret structure (similar to BART today)	Generally Positive
4	Small zones for all service	Mixed feedback, trending negative – concerns on how zones may raise fares for local services and for travellers who do not use multiple agencies	Mixed feedback – some recognition of improved understandability, however general concerns about the number of zones and ability to determine fare	Mixed feedback, trending negative – concerns on zones will impact fares that are flat today or use fare by distance (BART)
4	Unified Fare by Distance for Regional Services + Local Flat Fare and Large zones + local flat fare	Generally positive	Generally positive	Mixed feedback– some concerns about fare increases

Strategic Dimension – Summary

Tier	Option	Daily Ridership Growth		Equity Impacts	Customer Experience
		High Investment	Low Investment		
1	Individual Pass (“Puget Pass” model)		25,500	Requires mitigation	Generally Positive
2	No-cost transfers (local/local, local/regional)		11,500	Investment is balanced across income levels, with least low income travellers paying more	Generally Positive
2	No-cost transfers (local/local, local/regional, regional-regional)		27,610	Investment is balanced across income levels, with least 10% of low income travellers paying more and 20% paying less	Generally Positive
3	Unified Fare by Distance for Regional Services only	68,800	30,200	Investment is balanced across income levels, with least 10% of low income travellers paying more and 25% paying less	Generally positive with some issues to resolve
4	Unified Fare by Distance for Regional Services + Local Flat Fare	62,500	16,100	Investment is balanced across income levels, with 20% of low income travellers paying more but 65% pay less	Generally positive with some issues to resolve
4	Small zones for all service	44,000	-2,100	Investment is balanced across income levels, with 25% of low income travellers paying more but 73% pay less	Mixed feedback
4	Large zones + local flat fare	55,000	22,000	Investment is balanced across income levels, with 35% of low income travellers paying more but 65% pay less	Generally positive with some issues to resolve

Legend

Weaker performance	Moderate performance	Stronger Performance	Not Applicable
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Economic Dimension – what is the social value of each option?

The **Economic Dimension** evaluates each option based on the social value they can realize for local communities and the broader region.

These benefits include:

- **Traveler benefits** – including reduced travel time
- **Externalities** – including reduction in pollution, congestion, and collisions and improved health

Combined these metrics answer the questions:

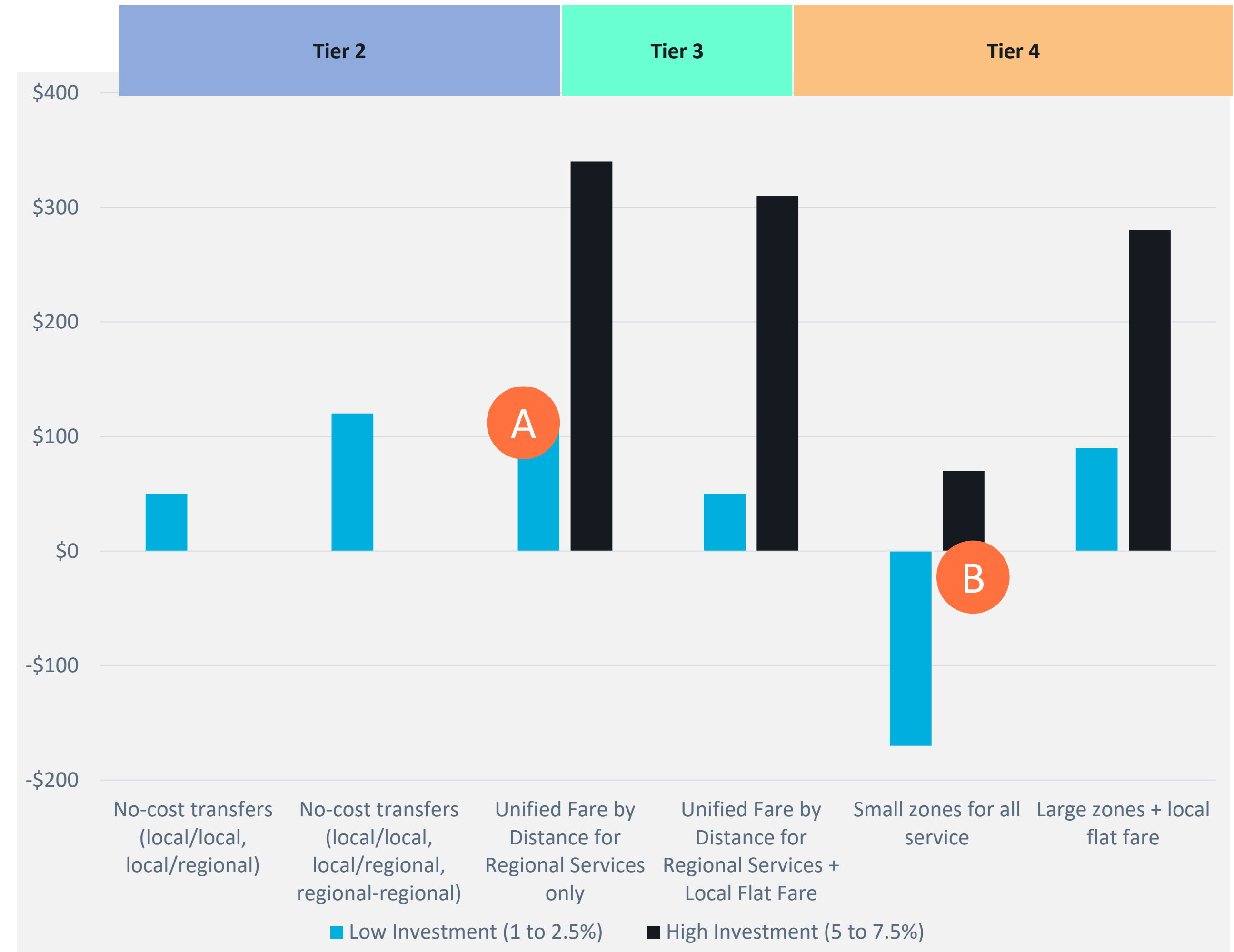
- What are the social benefits of Fare Integration over the next five years in discounted 2021 USD?
- Is the level of social value of the option appropriate for the risk and change management required to deliver it?

Economic Evaluation Summary

Overall, fare integration is likely to generate significant economic benefits to the region

Key Findings


- A** Of the low investment options, Tier 2 has the highest benefits over the first five years of integration – this is because it does not raise the price for any traveller (while Tier 3 and 4 options may require some increase at this level of subsidy) which results in higher VMT reduction
- B** Small zones has net negative economic performance at low levels of investment because it has a net increase in VMT due to a decrease in long distance inter county trips
- Increasing investment leads to higher benefits as it allows for generally lower fares and higher ridership compared to lower investment options




Financial Dimension – what is the financial impact of each option?

The Financial Dimension evaluates each option based on its impact to funding for transit.

It is focused on the following impacts:

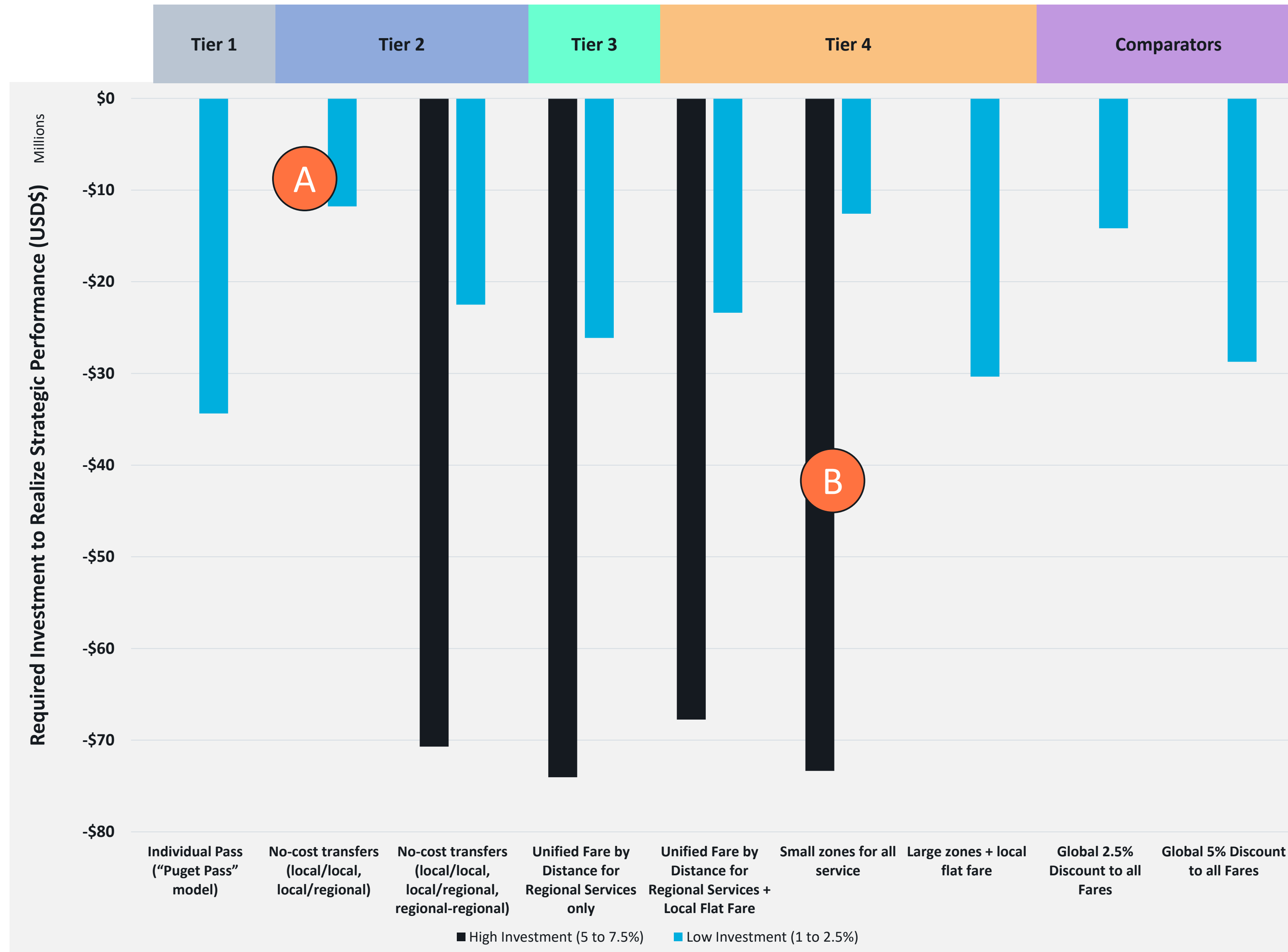
 **Required subsidy (total)**– strategic estimates of the total lost revenue from each fare option

 **Cost per new rider** – the level of subsidy required for each new trip

Combined these metrics answer the questions:

- What level of financial commitment is required to deliver integration?
- How cost effective is each option?
- How does the subsidy required for fare integration compare to other investments?

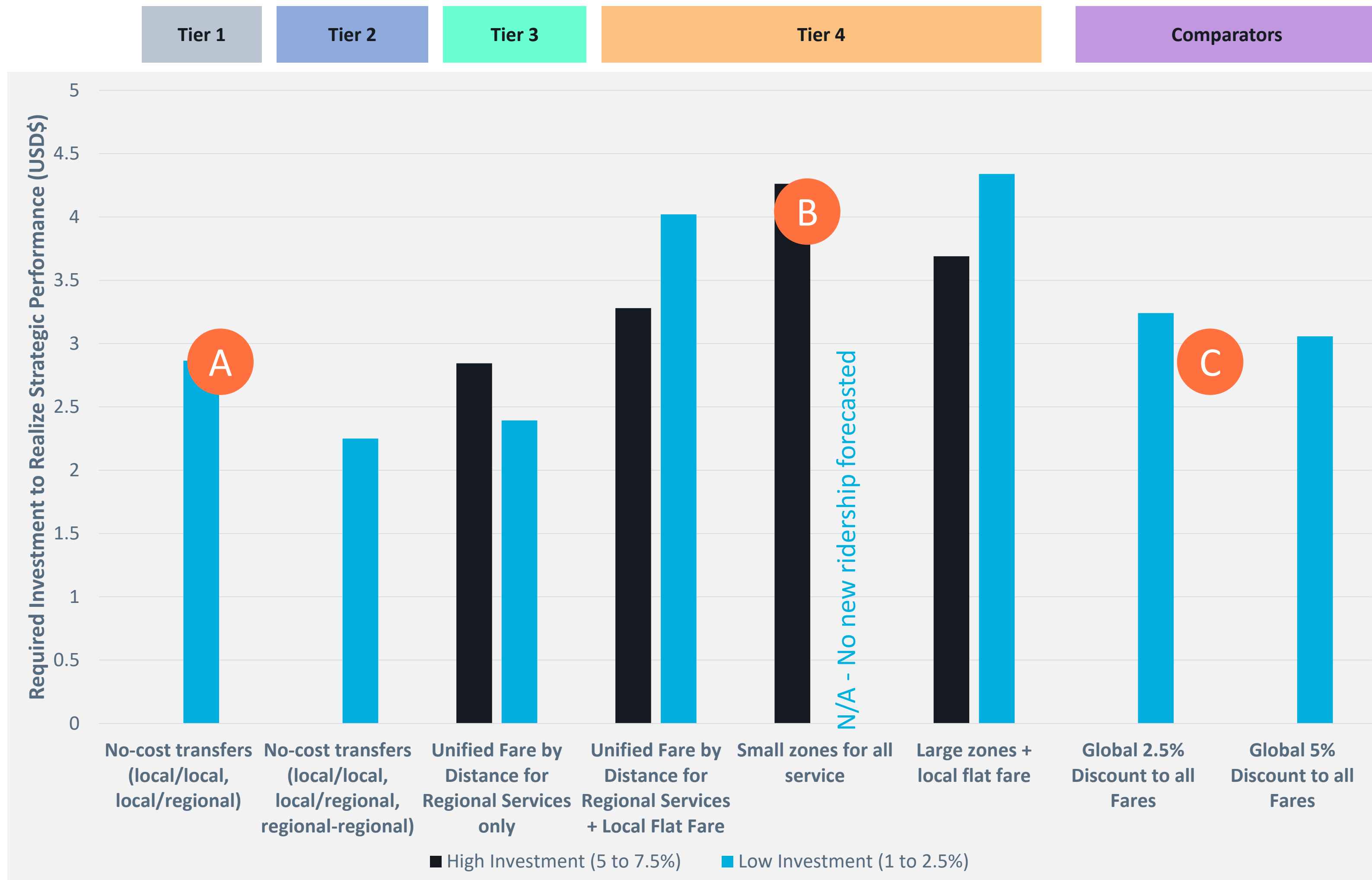
Financial Metric 1 – Required Subsidy



Findings

- A** The cost of transfer discounts between all services ranges between \$11-\$25 million per year based on initial estimates
- B** Broader standardization regional standardization of fares requires either significant new subsidy or raising fares for many customers to offset lost revenue – lower investment variants of Tiers 3 and 4 will have some fare increases to offset these losses, while high investment variants of fare by distance with flat local fares, zonal, and zonal with flat local fares options also have fare increases

Financial Metric 2 - Cost Per New Rider



Findings

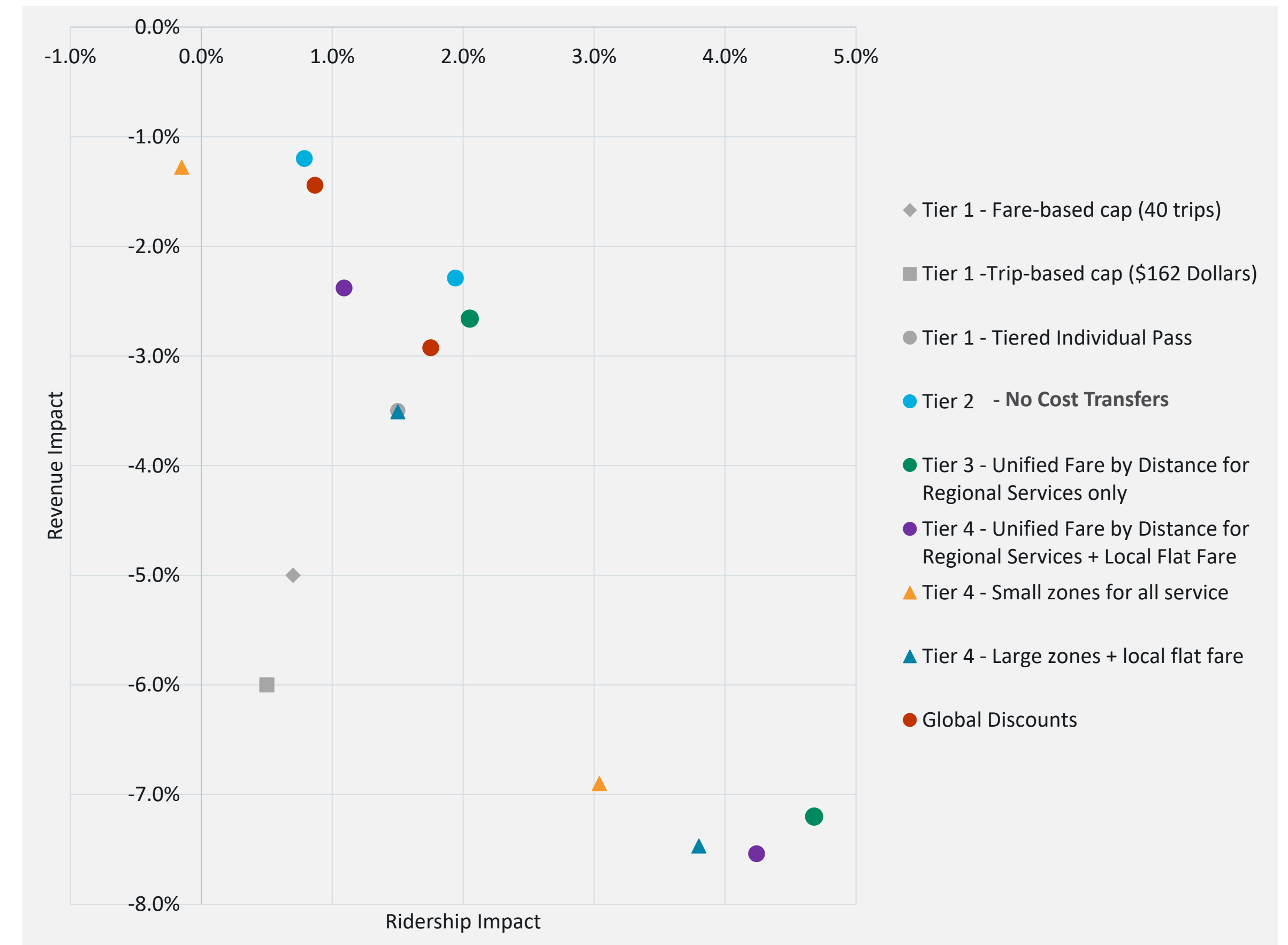
- A** Tier 2 has the lowest cost per new rider, while Tier 3 has a similar cost per new rider at low levels of investment
- B** Widespread changes proposed under Tier 4 are more expensive as they lose ridership in some markets and also generate growth in others – as level of subsidy applied to small zones decreases the cost per rider increases as there are more ridership losses in key regional markets
- C** Comparator tests illustrate that at a regional scale, direct discounts to the existing structure are likely to have greater value for money than Tier 4 as they do not raise/lower fares in a structured – but arbitrary – manner

Relationship Between Ridership and Subsidy for Each Option

The graph to the right illustrates the relationship between revenue change (or required subsidy) and ridership impacts for each option.

This graph can be used to explore comparative option performance for a set level of subsidy:

- **Low Investment (1-2.5%)** - Tier 2 and Tier 3 generate the most ridership, Tier 4 (small zones) loses ridership
- **High Investment (5% to 7%)** – Tier 3 has the highest ridership gain and exceeds Tier 4 options and 5 (small zones)
- **Ridership gains increase with level of investment as do cost per new, suggesting there is a diminishing return on investment but higher overall gains to be realized with more subsidy**

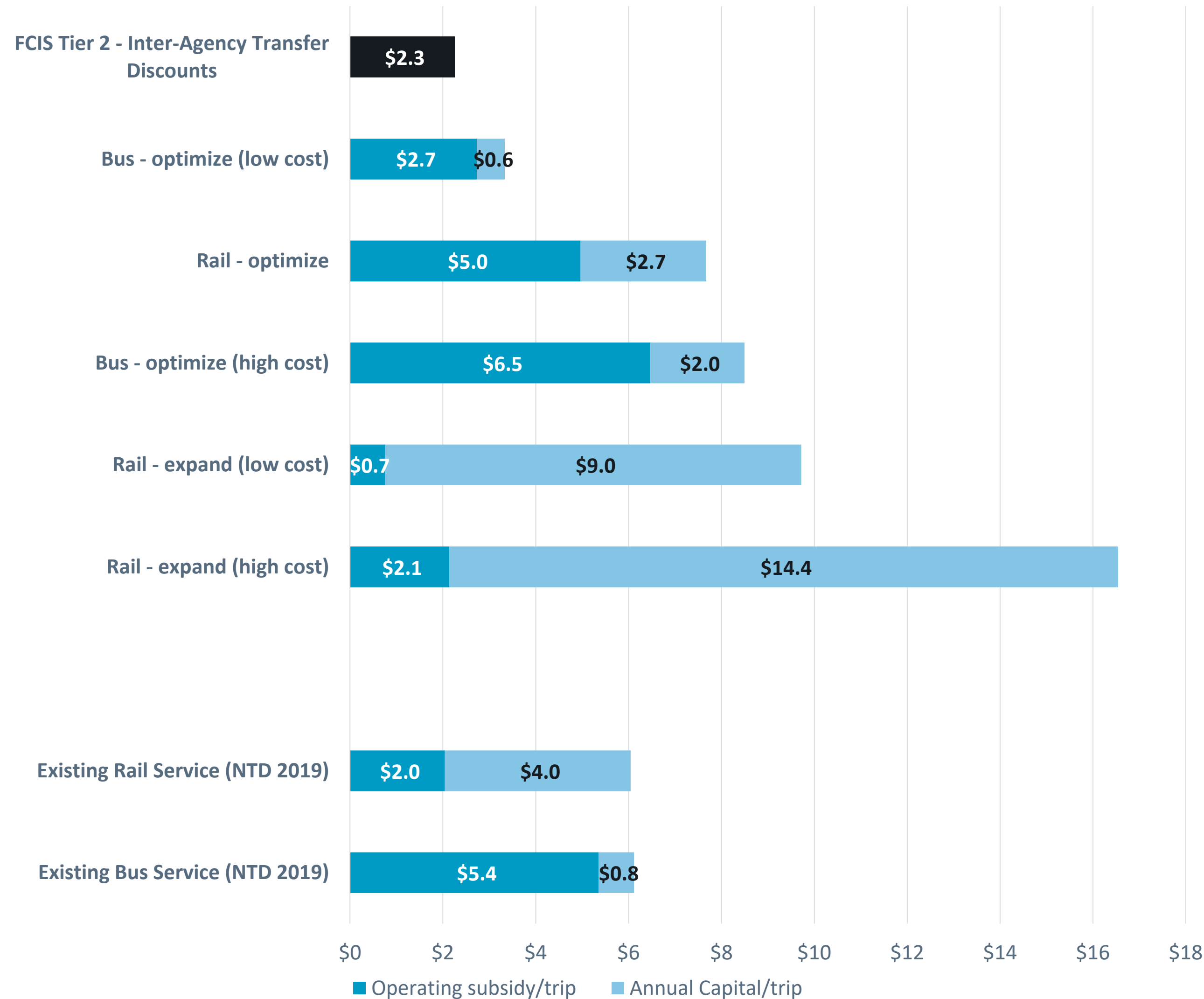


Financial Evaluation Summary

Options	Revenue Impacts (million USD/year)		Cost Per New Rider	
	High Investment (5 to 7.5%)	Low Investment (1 to 2.5%)	High Investment (5 to 7.5%)	Low Investment (1 to 2.5%)
Individual Pass (“Puget Pass” model)	-\$34		\$4.35	
No-cost transfers (local/local, local/regional)	-\$12		\$2.86	
No-cost transfers (local/local, local/regional, regional-regional)	-\$23		\$2.25	
Unified Fare by Distance for Regional Services only	-\$70	-\$26	\$2.84	\$2.39
Unified Fare by Distance for Regional Services + Local Flat Fare	-\$74	-\$23	\$4.02	\$3.28
Small zones for all service	-\$67	-\$13	\$4.26	
Large zones + local flat fare	-\$73	-\$30	\$4.34	\$3.69

Fare Integration Cost Efficiency vs Other Investment Options

Fare Integration - Cost Per New Trip vs Other Investment Types



Required subsidy for FCIS Tier 2 – Transfer Discounts - local/local, local/regional and regional/regional) has an estimated cost of \$2.25 per new trip.

This revenue impact is less than the estimated cost-per-trip of most proposed Bay Area transit projects (as modelled in Plan Bay Area 2050 using RTM 1.5)

The revenue impact is also less than the average cost-per-trip of the existing Bay Area transit system as of 2019.

Notes:

Other transit projects include 18 transit projects in Plan Bay Area selected for this analysis because they are likely or possible uses of regional funds. Only projects proposed by transit agencies and actively under development are included. Estimated fare revenue is subtracted from operating expense calculate operating subsidy.

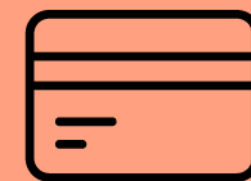
Operating subsidy of the existing system is based on operating expense minus fare revenue as reported to NTD in 2019. Capital cost is based on the average of capital expenditures as reported to NTD between 2010 and 2019 expressed in 2019 dollars.

Delivery and Operation Dimension – what is required to successfully deliver each option?

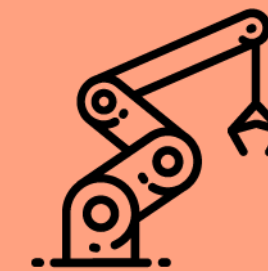
Delivery and Operation Dimension assesses each option based on the key changes required across the following dimensions:



Management – how will issues, risks, challenges, and changes will be managed over time?



Technology – how is it implemented and procured?



Operations and Infrastructure – how it will ‘run’ on a day to day basis and what infrastructure is required?



Customers – what level of change management is required for customers?

1 Overlays – Delivery Requirements



Management – low impact

- Can be delivered with agency to agency agreements
- or
- Can be delivered and managed centrally across the region
→ increased revenue allocation and pricing complexity

Technology – low impact

- Can be delivered with existing technology or with C2

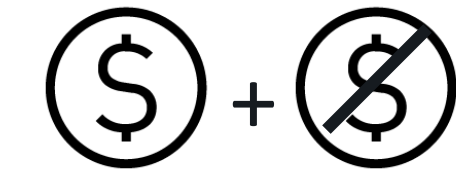
Agency Infrastructure and Operations – low impact

- Minimal changes – can be rolled out with operator training on the passes with some investment in marketing and communications
- Could also be marketed and communicated centrally

Customers / change management – low impact

- If a pass, it is opt in and will require marketing advertising
- Or
- If a cap, the cap should be advertised broadly but will automatically apply to customers and will not require additional action to access

2 Transfer Discounts – Delivery Requirements



Management – low impact / medium impact

- Can be delivered with agency to agency agreements
- or
- Can be delivered and managed centrally across the region
- Will require a formula for revenue allocation – either centrally or on agency pair basis

Technology – low impact

- Can be delivered with existing technology on a limited basis or completely with C2 under the initial roll out

Agency Infrastructure and Operations – low impact

- Minimal changes – can be rolled out with operator training (to message the discounts) and supporting advertising material
- Could also be marketed and communicated centrally

Customers / change management – low impact

- Only customers using multiple agencies are impacted – change management would focus on explaining the discount, although it is applied automatically
- If a general region-wide discount rule is applied (example: only pay highest fare, only pay regional fare) change management is simpler to roll out

3 Regional Change – Delivery Requirements



Management – low impact / medium impact

- Can be partially delivered with agency to agency agreements – for example, two regional operators making a single fare structure

or

- Can be delivered centrally across the region → one manager is responsible for setting fares and developing a formula for revenue allocation

Technology – medium impact

- Requires C2 and new fare setting approaches for one or more agencies

Agency Infrastructure and Operations – medium impact

- Requires new fare collection infrastructure, marketing materials, and staff training for all agencies that are integrated
- This could be done on an agency by agency basis or centrally

Customers / change management – medium impact

- End fare structure will either be fare by distance or zones across all regional operators – all operators already use a form of fare by distance or zones, so the change management process would focus on helping a select set of customers understand the new structure and make best use of it

4 Regional + Local Change Zones on All Modes – Delivery Requirements



Management – high impact

- ❑ Fare setting authority would need to be transitioned from local agencies and regional agencies to a central manager to ensure sustainable change (agreements are unlikely to sustain a regional fare structure over the long term)
- ❑ Requires an overhaul of revenue allocation and/or subsidy/funding allocation

Technology – medium impact / high impact

- ❑ Requires C2 and new fare setting approaches for all agencies
- ❑ Region wide zones would require tap off or a 'check out' function on buses

Agency Infrastructure and Operations – high impact

- ❑ Requires a range of new fare collection infrastructure, marketing materials, and staff training for all agencies across the region – likely requires a centralized approach
- ❑ Check out function on buses could have boarding / alighting impacts and operational impacts over the short to medium
- ❑ As fares change, some operators will require additional funding to cover shortfalls in fare revenue while maintaining level of service

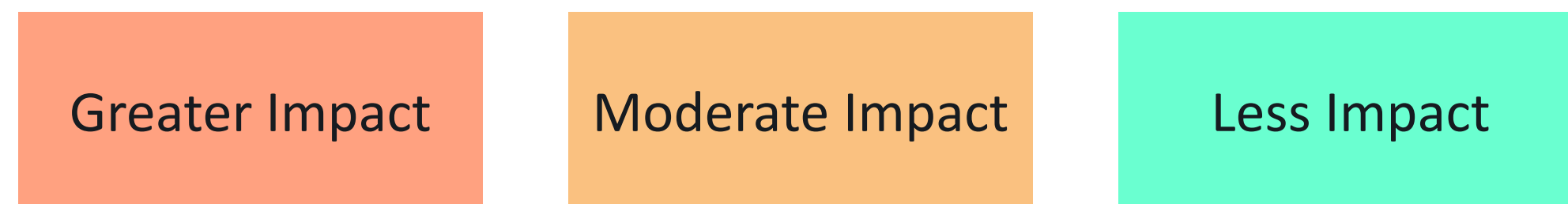
Customers / change management – medium impact / high impact

- ❑ Customers will have to learn fare by distance/zones for regional (see previous slide)
- ❑ Customers will either learn a flat fare for local (limited impact) or a zone structure which is more complex and will have wide-ranging changes for trips that used to be under an operator flat fare

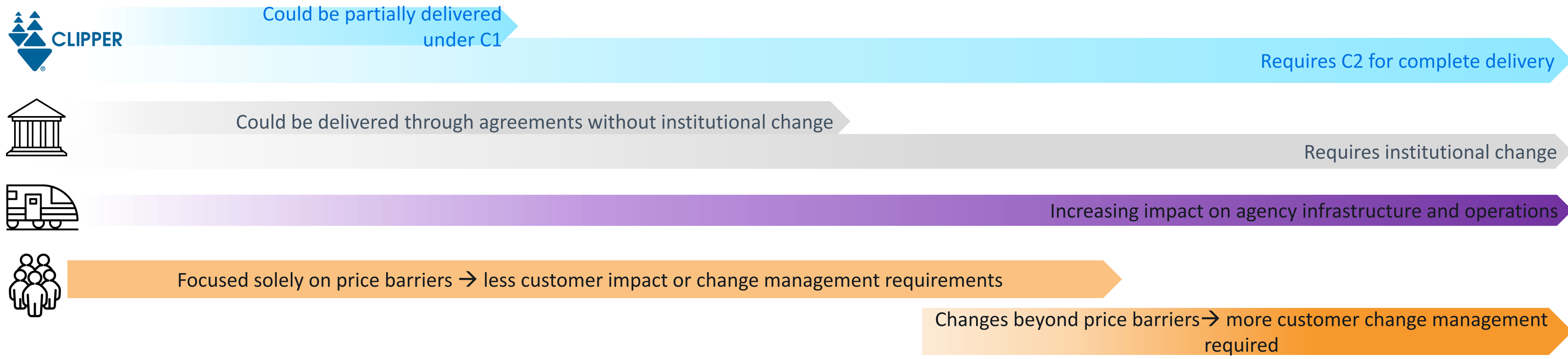
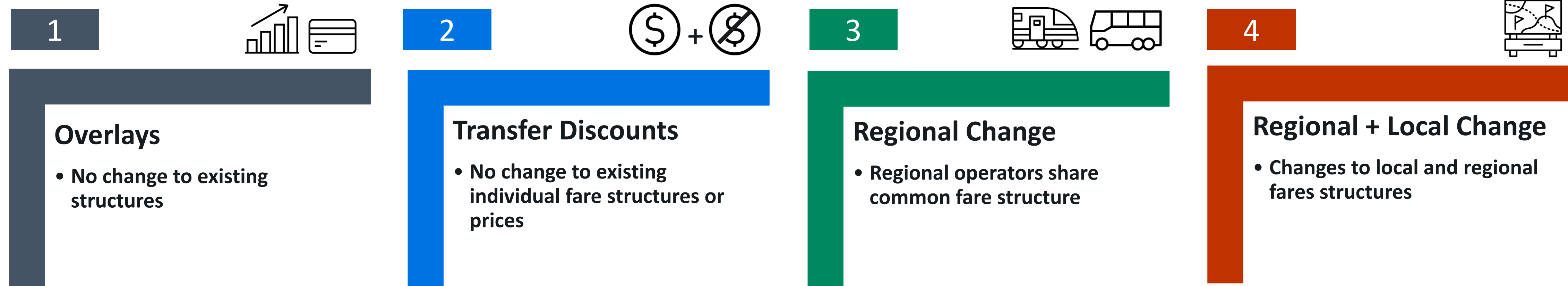
Delivery and Operation Dimension Evaluation Summary

Tier	Options	Management	Technology	Agency Infrastructure and Operations	Customer change management
1	Individual Pass (“Puget Pass” model)	Low	Low	Low	Low
2	No-cost transfers (local/local, local/regional)	Low/Medium	Low	Low	Low
	No-cost transfers (local/local, local/regional, regional-regional)				
3	Unified Fare by Distance for Regional Services only	Low/Medium	Medium	Medium	Low/Medium
4	Unified Fare by Distance for Regional Services + Local Flat Fare	High	Medium/High	High	Medium/High
	Small zones for all service				
	Large zones + local flat fare				

Legend



Delivery Evaluation Findings - Overall



1

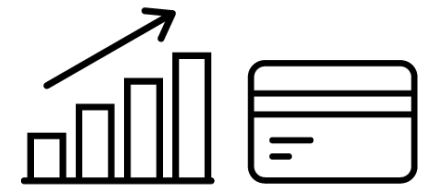
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Summary of Business Case by Tier and Dimension

1 Overlays to Fare Structure (Incremental Performance when Layered on Tier2)



What was tested?

- Trip-based caps (daily, weekly and monthly) at different trip thresholds (assuming local to regional free transfers)
- Value-based caps (daily, weekly and monthly) at various price points (assuming local to regional free transfers)
- Tiered pass product: local service only, all inclusive
- Puget Pass-styled product where transit rider's monthly pass value is based on most common trip value (multiplied by 36)

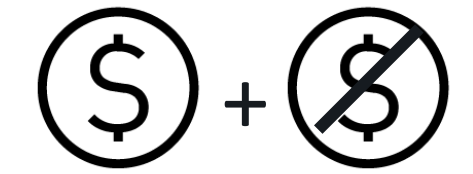
What did we learn?

- Tiered passes and caps are required to minimize revenue loss for regional operators while generating new ridership but may be more complex for customers to understand
- Customers are interested in a pass or product that applied to multiple operators
- A single trip cap or monthly pass with a set price for all travelers will either not generate ridership (if priced too high) or lose significant revenue (if priced too low)
- Further work needs to be completed to explore caps vs. passes – this work should explore balancing with ridership potential and available subsidy

Strategic	Economic
<p>Daily Trip Change: Fare Cap (\$162): +7,300 Trip Cap (35): +10,200 Individual Pass ("Puget Pass" model): +21,900</p> <p>Equity Impact: Passes require up-front payment, which may exclude lower income riders from benefits. Fare capping offers more equitable benefits.</p>	<p>Present Value of Economic Benefits: not completed due to different modelling platform (Clipper data does not include VMT) – anticipated to perform with a similar level as Options 3b high investment.</p>
Financial	Delivery
<p>Total required subsidy: Fare Cap (\$162): \$59m/year Trip Cap (35): \$49m/year Tiered Pass: \$34m/year</p> <p>Cost per new rider: Fare Cap (\$162): \$22.36 Trip Cap (35): \$13.31 Individual Pass ("Puget Pass" model): \$4.35</p>	<p>Overall Assessment: low impact – readily deliverable with some technology changes and new organizational agreements.</p>

2 Transfer Discounts

No-Cost Transfers



What was tested?

- **No-cost transfers (local/local, local/regional):** 100% discount for all local to local transfers (trips using multiple providers pay only one fare)
- **No-cost transfers (local/local, local/regional, regional-regional):** 100% discount for all local to regional transfers (trips using regional and local only pay the total regional fare)

What did we learn?

- The local to regional transfer market is the largest integration market in the Bay Area, local to local transfers are a smaller opportunity, but can support equity goals and overall fairness
- Combined, discounted transfers could generate up to 13,000 new transit trips a day with the lowest cost per new rider of Tiers 2-4
- These options are the least complex to implement and performed well in customer research, where customers valued their simplicity and reflection of fairness and value (reducing penalties to use multiple operators when required)

Strategic	Economic
<p>Daily Trip Change: No-cost transfers (local/local, local/regional): 11,500 trips per day</p> <p>No-cost transfers (local/local, local/regional, regional-regional): 25,500</p> <p>Equity Impact: Net savings for equity priority populations; some additional subsidy to higher income riders</p>	<p>Five Year Present Value of Economic Benefits: No-cost transfers (local/local, local/regional): \$50m (2021 USD)</p> <p>No-cost transfers (local/local, local/regional, regional-regional): \$120m (2021 USD)</p>
Financial	Delivery
<p>Total required subsidy: No-cost transfers (local/local, local/regional): - \$12m/year No-cost transfers (local/local, local/regional, regional-regional): \$23m/year</p> <p>Cost per new rider: No-cost transfers (local/local, local/regional): \$2.84 No-cost transfers (local/local, local/regional, regional-regional): \$2.25</p>	<p>Overall Assessment: low impact</p> <ul style="list-style-type: none"> • Readily deliverable within planned Clipper 2 • Requires multi-agency MOU

3 Changes to Regional Service Fares and Local Discounts

Unified Fare by Distance for Regional Services only



What was tested?

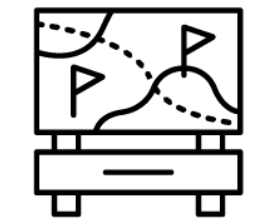
- 100% discount for all local to local transfers (trips using multiple providers pay only one fare)
- 100% discount for all local to regional transfers (trips using regional and local only pay the total regional fare)
- All regional services use a single distance or zonal structure (no transfer fees) → test used a BART structure for all services
- Subsidy of \$70 million, future tests underway to better compare to T2

What did we learn?

- Has ability to increase ridership beyond Tier 2 to up to 68,000 new trips per day (at \$70 million in subsidy) but cost per rider increases, however cost per rider is significantly lower than Tier 4 options
- Additional riders are long distance travellers making use of the combined regional network or use of re-priced regional services
- Customers identified this option is generally perceived as fair and reflects the value of a trip taken, however they noted additional tools would be required to fully understand it
- This option has moderate delivery requirements and could be delivered in stages (example: combining fares for two operators to start) or all at once

Strategic	Economic
<p>Daily Trip Change: High Investment: 68,000 Low Investment: 30,200</p> <p>Equity Impact: With significant new subsidy, some riders with lower incomes would see fares rise to achieve regional standardization</p>	<p>Five Year Present Value of Economic Benefits:</p> <p>High Investment: \$340m (2021 USD) Low Investment: \$110m (2021 USD)</p>
Financial	Delivery
<p>Total required subsidy: High investment: \$70 m/year Low Investment: \$26 m/year</p> <p>Cost per new rider: High investment: \$2.84 Low Investment: \$2.39</p>	<p>Overall Assessment: low impact/medium impact</p> <ul style="list-style-type: none"> • Requires new agreements or governance structure for regional service • Requires new technology • Requires some regional customers to learn a new structure

4 Changes to Regional and Local Fares



Unified Fare by Distance for Regional Services + Local Flat Fare

What was tested?

- FBD curve for all regional operators
- Single flat fare for all local operators – no transfer fees (100% discount to local fare) when using regional
- Subsidy of \$75m/year, future tests underway to better compare to T2

What did we learn?

- Ridership impacts similar to Tier 3 – although slightly lower as the FBD fare curve for this option must be higher to offset lost revenue from the local flat fare and maintain a comparable subsidy as T3 for comparison
- This option has higher cost per new rider than T3 but lower cost per new rider than small zones, this means it is generally more financially efficient than zones for all modes but less financially efficient than retaining individual local fares with free inter-operator transfers
- Customers noted that a local flat fare would be easier to understand than a free transfer but also noted it may lead to unfair changes in fares
- This option is more complex to deliver than Tiers 2 or 3 due to governance requirements but easier to implement than small zones because it does not require extra readers on each bus

Strategic	Economic
<p>Daily Trip Change: High Investment: 62,500 Low Investment: 16,100</p> <p>Equity Impact: Without significant new subsidy, some riders with lower incomes would see fares rise to achieve regional standardization</p>	<p>Five Year Present Value of Economic Benefits: High Investment: \$310m (2021 USD) Low Investment: \$50m (2021 USD)</p>
Financial	Delivery
<p>Total required subsidy: High Investment: \$74m /year Low Investment: \$23m /year</p> <p>Cost per new rider: High Investment: \$4.02 Low Investment: \$3.28</p>	<p>Overall Assessment: high impact</p> <ul style="list-style-type: none"> • Requires significant management and governance change for a sustainable structure • Requires significant changes to agency operations • Requires new technology on most regional operators (tap in, tap out)

4 Changes to Regional and Local Fares

Small zones for all service



What was tested?

- 81 zones
- Fares increase based on number of zones travelled
- Zonal ad-fares are the same for all modes
- Three levels of subsidy - \$100m/year, \$70m/year, \$12.5m/year

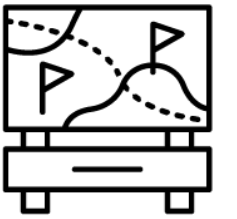
What did we learn?

- Ridership impacts are complex and vary from operator to operator due to the 'region-wide changes' (where some trips increase and other decrease in fare) included in this proposal
 - **High investment:** this option has a net loss of inter-county trips and gains 44,000 net new trips (of these 50,000 gross are in San Francisco using bus and LRT)
 - **Low investment:** this option has a region wide net loss in ridership (-2,000 trips) but it retains a net gain of 23,000 intercounty trips offset a loss of 25,000 inter-county trips
- This option has the highest cost per new rider and most challenging delivery requirements
- Customers noted that the number of zones included may be hard to understand and that the option does not inherently reflect value and fairness

Strategic	Economic
<p>Daily Trip Change: High Investment: +44,000 Low Investment: -2,000 (loss)</p> <p>Equity Impact: Without significant new subsidy, some riders with lower incomes would see fares rise to achieve regional standardization</p>	<p>Five Year Present Value of Economic Benefits: High Investment: \$70m (2021 USD) Low Investment: -\$170 (2021 USD)</p>
Financial	Delivery
<p>Total required subsidy: High Investment: \$67m/year Low Investment: \$13m/year</p> <p>Cost per new rider: High Investment: \$4.26 Low Investment: no new riders</p>	<p>Overall Assessment: high impact</p> <ul style="list-style-type: none"> • Requires significant management and governance change for a sustainable structure • Requires significant changes to agency operations • Requires new technology on all local and most regional operators (tap in, tap out) • Requires extensive change management for customers

4 Changes to Regional and Local Fares

Large zones + local flat fare



What was tested?

- 81 zones
- Fares increase based on number of zones travelled
- Zonal ad-fares are the same for all modes
- Two levels of subsidy - \$100m/year and \$70m/year, , future tests underway to better compare to T2

What did we learn?

- Ridership impacts are complex and vary from operator to operator due to the 'region-wide changes' (where some trips increase and other decrease in fare) included in this proposal
 - At \$70m per year, this option has a net loss of inter-county trips and gains 44,000 net new trips (of these 50,000 gross are in San Francisco using bus and LRT)
 - At \$10-15M per year, this option has a region wide net loss in ridership (-2,000 trips) but it retains a net gain of 23,000 intercounty trips offset a loss of 25,000 inter-county trips
- This option has the highest cost per new rider and most challenging delivery requirements
- Customers noted that the number of zones included may be hard to understand and that the option does not inherently reflect value and fairness

Strategic	Economic
<p>Daily Trip Change: High Investment: 55,000</p> <p>Low Investment: 22,000</p> <p>Equity Impact: Without significant new subsidy, some riders with lower incomes would see fares rise to achieve regional standardization</p>	<p>Five Year Present Value of Economic Benefits:</p> <p>High Investment: \$280m (2021 USD)</p> <p>Low Investment: \$90m (2021 USD)</p>
Financial	Delivery
<p>Total required subsidy: High Investment: \$73m/year Low Investment: \$30m/year</p> <p>Cost per new rider: High Investment: \$4.34 Low Investment: \$3.69</p>	<p>Overall Assessment: High impact</p> <ul style="list-style-type: none"> • Requires significant management and governance change for a sustainable structure • Requires significant changes to agency operations • Requires new technology on all local and most regional operators (tap in, tap out) • Requires extensive change management for customers

Performance Summary – Relative Performance (Tiers 2-4)

Dimension	Metric	Tier 1	Tier 2		Tier 3		Tier 4					
		Individual Pass (“Puget Pass” model)	No-cost transfers (local/local, local/regional)	No-cost transfers (local/local, local/regional, regional-regional)	Unified Fare by Distance for Regional Services only		Unified Fare by Distance for Regional Services + Local Flat Fare		Small zones for all service		Large zones + local flat fare	
Investment			Low	Low	High	Low	High	Low	High	Low	High	Low
Strategic	Change in Trips per Day	25,500	11,500	25,500	68,000	30,200	62,500	16,100	+44,000 (includes 50,000 new intra-county trips but - 6,000 inter county trips)	-2,000	+55,000	+22,000
	VMT Change per Day	N/A	-120,000	-290,000	-850,000	-265,000	-775,000	-131,000	0	+412,000	-700,000	-230,000
	Equity	Requires mitigation	Generally positive	Positive/Mixed	Mixed performance	Mixed performance	Mixed performance	Mixed performance	Mixed performance	Mixed performance	Mixed performance	Mixed performance
	Experience	Generally positive feedback	Generally positive feedback	Generally positive feedback	Generally positive with some issues to resolve		Generally positive with some issues to resolve		Mixed feedback		Generally positive with some issues to resolve	
Economic	Value of Benefits (million 2021 USD)	N/A	\$50	\$120	\$340	\$110	\$310	\$50	\$70	-\$170	\$280	\$90
Financial	Subsidy	\$34m	\$12m	\$22.5 m	\$70m	\$26 m	\$74m	\$23 m	\$67m	\$13m	\$73m	\$30m
	Cost per New Rider	\$4.35	\$2.86	\$2.25	\$2.84	\$2.39	\$4.02	\$3.28	\$4.26	No new riders	\$4.34	\$3.69
Implementation	Overall Risk and Impact Assessment	Low impact	Low impact	Low Impact	Medium impact		High impact		High impact		High impact	

Legend



Overall Summary: Tier Performance

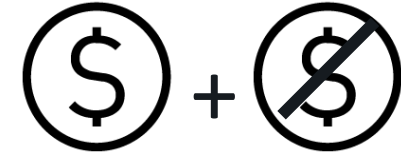
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Overlays

- **Strengths** – Readily deliverable
- **Potential Issues and Weaknesses** – Potentially high subsidy, frequency or opt-in based, does not support ridership growth outside of those who purchase the pas or hit the cap

2



Transfer Discounts

- **Strengths** – resolves integration price barriers, simple rules, complete coverage, deliverable under C2
- **Potential Issues and Weaknesses** – customers still interact with multiple structures, does not fully solve experiential barriers

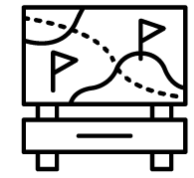
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Regional Change

- **Strengths** – same as Tier 2, however all regional trips use one structure which may augment customer experience and lead to additional ridership
- **Potential Issues and Weaknesses** – more challenging to implement and manage without governance changes

4



Regional + Local Change

- **Strengths** – one structure for region may improve customer experience
- **Potential Issues and Weaknesses** – Many riders experience fare changes (either higher prices or new subsidy) not directly related to promoting multi-agency travel
- Requires significant governance changes, expanded infrastructure, and change management at the customer and agency level