Final Report
As approved by the TransLink® Management Group

TransLink® Consortium

Integrated Fare Study

Booz | Allen | Hamilton

in association with

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1.0 Executive Summary

With over 1.5 million transit trips per weekday on buses, trains and ferries, the San Francisco Bay Area has one of the most diverse and extensive transit networks in the United States. This network is arguably the most complex in the country. Over two dozen transit agencies operate in nine counties, ranging in size from fewer than ten to more than 1,000 vehicles, and fewer than 100 to nearly 700,000 average boardings per weekday. Regional travel on public transit often involves more than one system. While the physical connections between systems are typically in place, it can be confusing and is often costly for customers to transfer among systems, especially with limited regional fare coordination. Minimal or non-existent and inconsistent fare integration among agencies can present barriers to building ridership, reducing congestion, improving air quality, reducing demand for parking at transit stations, and meeting other objectives.

Regional Measure 2 (RM2), which was authorized by Senate Bill 916, was approved by Bay Area voters on March 2, 2004. The measure raised the toll on State-owned toll bridges in the San Francisco Bay Area to fund congestion relief projects, including new ferry service across the Bay, BART infrastructure, construction of the new Transbay Terminal, more express buses, and planning for better transit connections. RM2 requires the TransLink® Consortium to develop a plan by July 1, 2008 for an integrated fare program covering regional rapid transit trips funded by Section 30914.5(e) of the California Streets and Highways Code.

This draft final report for the Integrated Fare Study discusses the alternative fare programs that were evaluated, including the goals, objectives and principles that guided the development of the alternatives, constraints that impacted the pricing of each alternative, and regional ridership and revenue projections for each alternative. It concludes with a discussion of approaches to sharing fare revenue among participating operators and recommendations based on study findings.

Study Goals, Objectives and Principles

Study goals and objectives, which were defined in conjunction with the Study Task Force, reflect a combination of the legislative language and intent and the interests and concerns of the Bay Area operators who are members of the TransLink® Management Group (TMG). The broad overall goal of the study, to use TransLink® to encourage greater use of the region's transit network by making it easier and less costly for transit riders whose regular commute involves multizonal travel, and may involve two or more operators, was tempered first by the Task Force and subsequently by the TMG to reflect the agencies' concern that any integrated fare recommended by the study should be "revenue neutral." In this context, revenue neutrality is desired by transit agencies to assure that there is no decrease in operating revenues resulting from the integrated fare proposal, particularly in light of the operating and capital shortfalls the region's transit providers are already facing.

Regional Fare Alternatives and Pricing Constraints

The market for an integrated regional fare is the commuters and their commute trips that may be attracted to transit in order to meet the legislative goal of relieving congestion by encouraging greater use of the transit network, including commuters who do not currently use transit at all, commuters who use transit for part of a trip but not the whole trip (e.g., drive to a park-n-ride and then take transit), and commuters who make most of their commute trips but not all of them by transit. In addition, an integrated regional fare product may cause some current transit commuters to shift from existing fare products for reasons of convenience or price.

In the nine-county Bay Area, transit is estimated to account for approximately 10 percent of total commute trips. While some commute trips cannot be served by transit, either because service is not currently available or due to other trip-specific constraints, the Study identified several geographic markets that are served by transit, where large volumes of commute trips are concentrated but with relatively low (less than six percent) shares of the trips made by transit. Another target market is the "partial transit user" who currently drives to a park-n-ride lot or a train station and then completes the commute by transit. With an integrated fare product and connecting transit services that meet commuter needs, these riders might also be induced to use transit to access the lot or station.

In discussions with the Task Force, several integrated fare alternatives were identified and refined and then evaluated to assess their impacts on transit ridership and transit fare revenues. Four concepts (and some variations to them) were evaluated:

- Concept 1: Regional Monthly Pass – a monthly pass valid between specific zones (residence zone and work zone), including travel on local feeder services in the origin zone, the regional operator, and local distributor services in the destination zone. Variations on this concept would reduce the revenue risk by capping the number of trips allowed on the regional service or by limiting local trips to those linked to a trip on a regional provider.
- Concept 2: Regional Pass Plus – building on the BART Plus concept, the regional operator portion of this alternative could be a stored value ticket, stored trip ticket, or pass-based product. It would also provide a pass valid for local travel in specific origin and destination zones. A variation on this concept would further reduce revenue risk by limiting local trips to those linked to a trip on a regional provider.
- Concept 3: Single Ride Discount – a fare valid for a single trip between two specific zones, including travel on local feeder service(s) in the origin zone, a regional operator, and local distributor service(s) in the end zone.
- Concept 4: Trip Value Monthly Pass – a monthly pass valid for transit trips up to and including a specified cash fare, or trip value.

Pricing constraints were defined for each of the integrated fare concepts based on market data and concerns that the fare should not undercut the revenues generated by each of the transit agencies' existing fare structures, as mandated by the TMG.

Study Results and Recommendations

With the "revenue neutral" constraint, ridership and fare revenue results were similar for each concept. Although transit users are price sensitive, the requirement to maintain revenue neutrality for the transit agencies means that prices of regional integrated fare products must be set at levels that offer minimal savings over existing fares. In addition, despite the absence of a comprehensive integrated fare option in the Bay Area, there are cases where individual operators have developed integrated pass or transfer agreements. For example, SFMTA's Fast Pass is valid on BART within San

Francisco and generates 12 million boardings per year; on the Peninsula, agreements between Caltrain, SamTrans and SCVTA enable Caltrain riders who have passes for trips of two or more zones to travel free on SamTrans and SCVTA. Many of those agreements will migrate to TransLink® as more transit agencies implement the system. For reasons like these, ridership levels are unlikely to increase substantially as a result of implementing a revenue neutral integrated fare.

The analysis of integrated fare alternatives projects regionwide ridership increases on the order of 300 to 500 boardings per weekday and very small negative impacts on annual regional fare revenues ($160,000 to $340,000). Compared to current average Bay Area weekday boardings of approximately 1.5 million, ridership would increase less than 0.2%. Consequently, if revenue neutrality is an unavoidable constraint, it is the recommendation of this study that no further steps be taken to develop a regional integrated fare product.

However, the Integrated Fare Study did develop and evaluate several regional fare products that could be viable if revenue neutral pricing were not a constraint. In particular, the Trip Value Monthly Pass is attractive for reasons such as the following:

- It is simple, making it easy to understand, explain and use. In fact, the concept has been implemented successfully in the Seattle area.
- It does not require transit operators to make any changes to their fare structures. For operators that do not currently offer a monthly pass, the pricing strategy could address concerns about introducing a pass-based product.
- It does not require the creation of geographic zones across the region, which can be complicated to explain, understand and use, but uses the implicit zones that are already in place based on each operator's service area and fare structure, including BART's 43x43 station fare matrix, and the geographic zones that Caltrain and Golden Gate Transit have defined. Customers avoid paying extra because the pass is priced to the cash fare of the service used instead of the most expensive trip possible among different operators by zone pair.
- It avoids some zone-based pricing in the Monthly and Regional Pass Plus alternatives that is counterintuitive (e.g., a monthly pass from San Francisco to Peninsula is more expensive than a monthly pass from San Francisco to Silicon Valley because taking BART to SFO is more expensive than taking Caltrain to Redwood City).

- It provides a monthly pass, consistent with RM2 requirements.
- It is flexible and will accommodate changes in operator fare structures (e.g., introduction of peak/off-peak fares, or services that are priced at a premium or a discount).
- Its flexibility will also readily accommodate changes in cash fares. Unless a specific face value did not already exist, users would simply purchase a pass with the appropriate face value.
- Its flexibility would also easily accommodate additional rider groups and their associated price structures, such as seniors, persons with disabilities and youth.
- It could be implemented prior to a full TransLink® rollout, although the effectiveness of the program would increase as more of the regional operators and the larger feeder/distributor operators participated.

However, given the revenue neutrality constraint, the Trip Value Monthly Pass approach cannot be pursued further at this time because it would require pricing the fare at a level that would not result in meaningful ridership gains.
In conclusion, although Bay Area transit agencies are experiencing increased ridership as a result of gas prices, the creation of a *revenue neutral* integrated fare in and of itself is not likely to increase ridership. In fact, because the cost of the pass will be high in order to maintain revenue neutrality, it is likely that investments in marketing, promotions, service, and service connectivity improvements will attract additional transit riders more effectively than a revenue neutral integrated regional monthly pass.

However, in evaluating alternative pricing structures to determine those that would be revenue neutral, a broad range of prices was evaluated, including some that yielded non-revenue neutral results. If revenue neutrality were not a constraint (e.g., if transit agencies were able to accommodate a limited impact on fare revenue or if a funding source could be identified to subsidize the cost of implementation), some alternatives such as the Trip Value Monthly Pass may merit further consideration. Transit agencies in other cities have implemented non-revenue neutral approaches to regional fare integration and similar alternatives could be considered for the Bay Area.

2.0 Background

With over 1.5 million transit trips per weekday on buses, trains and ferries, the San Francisco Bay Area has one of the most diverse and extensive transit networks in the United States. This network is arguably the most complex in the country. Over two dozen transit agencies operate in nine counties, ranging in size from fewer than ten to more than 1,000 vehicles, and fewer than 100 to nearly 700,000 average boardings per weekday. Regional travel on public transit often involves more than one system. While the physical connections between systems are typically in place, it can be confusing and is often costly for customers to transfer among systems, especially with limited regional fare coordination. Minimal or non-existent and inconsistent fare integration among agencies can present barriers to building ridership, reducing congestion, improving air quality, reducing demand for parking at transit stations, and meeting other objectives.

Despite the absence of a comprehensive integrated fare option in the Bay Area, there are cases where individual operators have developed integrated pass or transfer agreements. SFMTA's Fast Pass is valid on BART within San Francisco and is a popular program that generates 12 million boardings per year. On the Peninsula, agreements between Caltrain, SamTrans and SCVTA enable Caltrain riders who have passes for trips of two or more zones to travel free on SamTrans and SCVTA. Fare agreements like these are particularly beneficial for the customer and for overall regional mobility, but have financial impacts on the participating transit agencies. Historically, these concerns have impeded expansion of fare integration throughout the region.

Over the long run, however, integrated fare structures can build ridership and fare revenue depending on the level of discount offered. Historically, New York City Transit riders using both buses and the subway system paid two fares and did not have a monthly pass option. In 1997, New York City Transit introduced MetroCard and with it free transfers between bus and subway. A year later, 7-day and 30-day passes valid for unlimited travel on buses and subways were introduced. During the seven-year period between 1996 and 2002, fare revenues (not adjusted for inflation) increased by over $80 million (4%), although base fares did not change. Annual ridership grew by over 680 million rides (33%), or more than two million trips per weekday.

Regional Measure 2 (RM2), which was authorized by Senate Bill 916, was approved by Bay Area voters on March 2, 2004. The measure raised the toll on State-owned toll bridges in the San Francisco Bay Area to fund congestion relief projects, including new ferry service across the Bay, BART infrastructure, construction of the new Transbay Terminal, more express buses, and planning for better transit connections. Additionally, the provisions of RM2 require the TransLink® Consortium to develop a plan by July 1, 2008 for an integrated fare program covering regional rapid transit trips funded by Section 30914.5(e) of the California Streets and Highways Code. This report is part of the **Regional Zonal Integrated Fare Study** ("Study") that is being conducted for that purpose. In the following discussion, text in italics is quoted from the Streets and Highways Code.

As an element of legislation that is designed to ease congestion and reduce emissions, the Study as well as the resulting integrated regional fare program are intended to support those goals. The stated purpose of the integrated fare program is *to encourage greater use of the region's transit network by making it easier and less costly for transit riders whose regular commute involves multizonal travel and may involve the transfer between two or more transit agencies, including regional-to-regional and regional-to-local transfers.* **This stipulation requires a discounted fare product to be designed specifically for regular commuters whose trips are multizonal and may involve transfers between two or more transit agencies.**

The regional transit trips targeted by the legislation and the resulting integrated regional fare are trips made on *long-haul transit services that cross county lines, and operate mostly in dedicated rights-of-way, including freeway high-occupancy vehicle lanes, crossing a bridge, or on the bay.* "Interregional rail services, originating or terminating from outside the bay area" are specifically excluded from the definition of regional transit services. **This language targets transit trips that cross county lines and operate in dedicated rights of way, including bus services operating in HOV lanes or across bridges and rail and ferry services.**

RM2 also specifies that the integrated fare product should be a zonal, monthly pass. The zonal fare system is required *for the sole purpose of creating a monthly zonal pass allowing for unlimited or discounted fares for transit riders making a minimum number of monthly transit trips between two or more zones. To the extent practical, zone boundaries for overlapping systems shall be in the same places and shall correspond to the boundaries of the local transit service areas. A regional rapid transit zone may cover more than one local service area, or may subdivide an existing local service area.*

The legislation requires the regional fare product to be a monthly pass and further states that:

- *The integrated fare program shall not apply to fare structures that are not purchased on a monthly basis.*
- *The number of minimum trips* [per month] *shall be established by the plan.*
- *The monthly pass shall be created in at least the following two forms: (1) for the use of interzonal regional rapid transit trips without local transit discounts and (2) for the use of interzonal regional rapid transit trips with local transit discounts.*

The legislation's author was Ezra Rapport, who was Senator Don Perata's Legislative Policy Analyst at the time the Senator introduced the legislation. In November 2007, soon after the Integrated Fare Study was initiated, Mr. Rapport provided clarification on wording in the legislation, confirming that the integrated regional fare should be a TransLink® product and noting that:

- The objective is to develop a "highly marketable product of broad applicability that is similar to other metro regions that support high volumes of inter [sic] regional travel"
- "An interzonal incentive based system [is] proposed using TransLink® as the central revenue splitting model."
- A monthly pass is included in the study, and alternative structures may also be proposed "with demonstration of superior benefits"
- There is no exclusion for operators that do not presently have monthly passes. However, creative options could be considered for accumulating charges in a regional integrated monthly pass for those systems.

The Study has been guided by a Task Force that includes representatives of the members of the TransLink® Management Group (TMG): the Metropolitan Transportation Commission (MTC), Alameda-Contra Costa Transit District (AC Transit), Bay Area Rapid Transit District (BART), Golden Gate Bridge Highway and Transportation District (Golden Gate Transit), Peninsula Corridor Joint Powers Board (Caltrain), San Francisco Municipal Transportation Agency (SFMTA), San Mateo County Transit District (SamTrans), Santa Clara Valley Transportation Authority (SCVTA), and Livermore Amador Valley Transit Authority (LAVTA), which represents the smaller transit agencies.

The study was initiated through meetings with each of these agencies. Working with the Task Force, agreement was reached on goals and objectives for the study:

Goal:

Use TransLink® to encourage greater use of the region's transit network by making it easier and less costly for transit riders whose regular commute involves multizonal travel, and may involve two or more operators

Objectives:

- The integrated fare product should be revenue neutral and should not adversely affect revenue, expenses or service quality of any of the participating agencies[1]
- Integrated fare product pricing should not encourage migration from existing fare products or services or erode fare revenue (unless desired by the individual operator)
- Despite the language of the legislative mandate, the study should be expanded to include fare product alternatives beyond a monthly pass, such as per trip options and accumulators
- The integrated fare product should be customer friendly, and easy to understand and administer
- The market and demand, both existing and new, for the integrated fare product should be clearly identified
- The investment required to implement and sustain the integrated fare product as well as the impact that the integrated fare product will have on the market should be considered
- The study should lay the groundwork for further simplifying and integrating fares in the region
- Implementation of the integrated fare product should increase transit ridership
- Subsidy sharing opportunities across operators should be considered and highlighted
- The study should result in enhanced and standardized data collection and data sharing among operators

[1] *The Goals and Objectives are stated as they were accepted by the Task Force. In response to a request for clarification on guiding principles for the study, in March 2008 the TransLink® Management Group stipulated that the integrated fare product should be revenue neutral. The guiding principles are discussed further in Section 3 of this report.*

The study team next examined the market for an integrated regional fare and alternatives for implementing a product consistent with the legislative requirements and the study goals and objectives. Inasmuch as the context of the legislation is "commuters" and "commute trips," this is the target market and the focus of the study. Several approaches were identified, but their market potential was constrained by previously agreed study objectives. As a result, the study team met with the TransLink® Management Group (TMG) on April 16, 2008 to discuss three key guiding principles for developing the integrated regional fare alternatives:

1. Should the study consider alternatives that address all the identified market segments?
2. Should the study be open to options that are not revenue neutral?
3. Should the study consider fare products that would be offered in lieu of existing inter-operator fare products?

The TMG agreed that the potential market for an integrated regional fare product should be expanded to include current transit users who might be induced to increase their transit trips and that the study should consider the possibility of eliminating existing, competing inter-operator fare products, but stipulated that the recommended fare product must provide revenue neutrality for the participating operators.

Like most U.S. transit agencies, revenue recovery is an issue for Bay Area transit agencies, particularly at a time when the agencies are facing both capital and operating shortfalls. On average, the transit providers in the Bay Area recovered 26.1 percent of operating costs through fare revenue in FY 2007[2], ranging from a low of 9.9 percent to a high of 57.0 percent. MTC's most recent update to the Regional Transportation Plan projects a $20 billion capital shortfall over the next 25 years. Proposed cuts in State funding for public transit may further aggravate the revenue situation next year. In the face of shortfalls like these, transit providers are particularly cautious about safeguarding fare revenues – hence, the concerns for revenue neutrality articulated by both the Task Force and the TMG.

[2] *Statistical Summary of Bay Area Transit Operators (March 2008).*

The following documents, which were prepared as part of the Study, provide further detail on the results of the initial outreach to the transit operators, existing transit services and fare policies, and regional commute markets and travel patterns in the Bay Area:

- Integrated Fare Study: Goals and Strategies (December 4, 2007)
- Integrated Fare Study: Background Report (January 18, 2008)
- Integrated Fare Study: Background Report Addendum (February 5, 2008).

This report identifies integrated fare alternatives that meet the study requirements, as well as some that meet the intent of RM2, and provides the results of the evaluation of each alternative, including the market segments affected and estimated ridership and revenue impacts, as well as the Study recommendations. The remainder of this report is organized as follows:

- **3.0 Guiding Principles –** discusses the implications of the guidance provided by the TMG for the integrated regional fare study.
- **4.0 Regional Fare Alternatives –** identifies strategies for developing an integrated fare program that is consistent with the study requirements and merits further analysis based on discussions with Bay Area transit operators.
- **5.0 Pricing Constraints –** Identifies the appropriate product pricing for each of the integrated fare concepts presented in Section 4.0.
- **6.0 Ridership and Revenue Impacts –** provides the ridership and fare revenue projections for each of the evaluated integrated fare program alternatives.
- **7.0 Revenue Distribution Considerations –** describes considerations with respect to revenue distribution among participating transit operators.
- **8.0 Recommendations for Integrated Fare Program –** provides recommendations for the integrated fare program.

Appendices to this report provide additional information on regional transit fare programs in place among peer agencies and a glossary of the terms used in this report.

3.0 Guiding Principles

On April 16, 2008 the study team met with the TMG to clarify and reach agreement on the three key guiding principles for developing the integrated fare alternatives. The TMG was asked to respond to the three following questions:

1. Should the study consider alternatives that address all the identified market segments?
2. Should the study be open to options that are not revenue neutral?
3. Should the study consider fare products that would be offered in lieu of existing inter-operator fare products?

The TMG's response to and implications of these three key guiding principles are discussed in this section.

3.1 IDENTIFIED MARKET SEGMENTS

The TMG agreed that the target market for the integrated regional fare product should not be limited to commuters who do not currently use transit. Instead, partial transit users (those who use transit to complete part of a trip) and frequent transit users (those who commute by transit frequently but not always), as well as non-transit users (those who currently do not use transit), are all potential targets for opportunities to increase transit ridership and addressing all three markets expands the utility and reach of integrated fare products.

Attracting current non-transit users to use transit is of interest, particularly for regional trip geographies with high regional travel volumes and low transit market shares. To help understand these geographies, a regional fare zone map was developed that divides the Bay Area into the twelve geographic fare zones[3] shown in Figure 3-1 on the next page.

[3] *Fare zones are a requirement of the RM2 legislation. The bases for the 12 geographic fare zones were discussed in the Integrated Fare Study: Background Report dated January 18, 2008. The zones are roughly based on current regional travel patterns, county boundaries, fare structures for transit agencies with distance-based fares, and service areas for both regional and local transit providers. All of these will be considerations in designing a zone-based integrated regional fare.*

Figure 3-1: Regional Fare Zone Map

Table 3-1 shows the total travel volumes and current transit mode shares between the geographic fare zones identified in Figure 3-1.

Table 3-1: Zonal Pairs by Total Travel Demand and Transit Mode Share

	Central Alameda	West Contra Costa	East Contra Costa	Napa/ Solano	Tri-Valley	South Alameda	Penin-sula	Silicon Valley	San Jose	Marin	Sonoma
San Francisco											
Central Alameda	-										
W. Contra Costa		-									
E. Contra Costa			-								
Napa/Solano				-							
Tri-Valley					-						
South Alameda						-					
Peninsula							-				
Silicon Valley								-			
San Jose									-		
Marin										-	

- The yellow cells represent zonal pairs that have high travel demand (50,000 or more trips per weekday) and high transit mode shares (6 percent or more).
- The red cells represent zonal pairs with high travel demand and low transit mode shares (less than 6 percent). These are the target geographic markets of non-transit users for this study.
- The blue cells represent zonal pairs with low travel demand (less than 50,000 trips per weekday) and high transit mode shares.
- The gray cells represent zonal pairs with low travel demand and low transit mode shares.

Another way to think about key geographic markets for non-transit users are the zonal pairs that have the highest number of non-transit trips, as shown in Table 3-2, as these represent possible markets for increased transit usage if transit services are available to meet the needs of these potential users.

Table 3-2: Zonal Pairs by Number of Non-Transit Trips

	Central Alameda	West Contra Costa	East Contra Costa	Napa/ Solano	Tri-Valley	South Alameda	Penin-sula	Silicon Valley	San Jose	Marin	Sonoma
San Francisco											
Central Alameda	-										
W. Contra Costa		-									
E. Contra Costa			-								
Napa/Solano				-							
Tri-Valley					-						
South Alameda						-					
Peninsula							-				
Silicon Valley								-			
San Jose									-		
Marin										-	

- The four dark green cells represent zonal pairs with 200,000 or more trips per weekday not made by transit but on other modes such as automobiles, carpools, bicycles, etc. These cells are the target geographic markets of non-transit users for this study using this metric.
- The 14 medium green cells represent zonal pairs with between 50,000 and 200,000 non-transit trips per weekday.
- The 16 light green cells represent zonal pairs with between 20,000 and 50,000 non-transit trips per weekday.

- The gray cells represent zonal pairs with less than 20,000 non-transit trips per weekday.

Non-transit users may also include people who might otherwise take transit were it not for parking capacity limitations at transit stations, particularly at many BART and Caltrain stations. These non-transit users might be attracted to transit if it was more financially advantageous to use feeder services to access stations.

Partial transit users are commuters who use transit for part of the trip and drive for part of it (e.g., drive to/from a park-and-ride lot). The two largest potential markets are riders who commute on BART and Caltrain.

Among BART riders, there are an estimated 42,000 partial transit users per day:

- BART has about 46,000 parking spaces systemwide and reports that the vast majority of these spaces (~90 percent) are filled each weekday. This represents a potential market of about 42,000 partial transit users who could find value in an integrated fare product.
- The estimated breakdown of these potential riders by fare zone is as follows:

Fare Zone	Riders
East Contra Costa	13,000
South Alameda	9,100
Peninsula	8,700
Central Alameda	4,900
West Contra Costa	3,200
Tri-Valley	2,700

- Monthly reserved parking fees at these BART stations currently range from $30 to $115.50. Fourteen of BART's 32 station lots charge daily parking fees ranging from $1 to $5 per day.

Among Caltrain riders who are commuters, the estimated number of partial transit users is 4,100 per day:

- Caltrain has about 7,100 parking spaces systemwide. Based on data from a study completed in 2003, about 60 percent of these spaces fill up each weekday, although the percentage varies greatly by station. This represents a potential market of about 4,100 partial transit users.
- The estimated breakdown of potential Caltrain riders by fare zone is as follows:

Fare Zone	Riders
San Jose	1,800
Peninsula	1,400
Silicon Valley	900

- Monthly parking fees at these stations are $20. Daily parking fees are approximately $2 (parking is free south of the San Jose Diridon station).

Frequent transit users are commuters who use transit frequently but not always (e.g., use transit some days and drive other days). These riders may be enticed by a monthly pass that pushes them to reach a threshold number of trips. Data for this market segment are available for a subset of Bay Area operators:

Transit Operator	Trip Frequency Distribution (% of ridership traveling x days per week)			
	5+ days	3-4 days	1-2 days	< 1 day
BART	58%	14%	9%	19%
Caltrain	53%	24%	9%	14%
AC Transit	72%	17%	7%	3%
SamTrans	75%	12%	7%	6%
County Connection	57%	21%	22%	0%
Fairfield-Suisun (local)	45%	26%	18%	11%
Fairfield-Suisun (intercity)	58%	21%	9%	12%
Vacaville	49%	28%	15%	8%
Vallejo (intercity)	43%	20%	18%	20%
Wheels	65%	20%	10%	6%

3.2 REVENUE NEUTRALITY

Being constrained to revenue neutral options does not necessarily limit the concepts that can be considered, but it does limit the level of discounts that can be provided and the overall additional ridership potential of an integrated regional fare. Any product that provides a discount to an appreciable number of existing riders will result in fare revenue loss, and results of previous fare studies indicate that the additional fare revenue received from new riders will not cover this shortfall (i.e., transit fare elasticities tend to be inelastic; discounted fare products tend to increase ridership and decrease fare revenue). As a result, providing discounted fares as alternatives to current inter-operator transfer agreements (e.g., BART-SFMTA, which has about 51,000 transfers per weekday; BART-AC Transit, with about 20,000 transfers per weekday; and Caltrain-SFMTA, with about 15,000 transfers per weekday) is not an option due to the high number of existing riders involved, unless sufficient additional revenue is generated through other fare policy changes.

Since BART and Golden Gate Transit do not offer monthly passes, any integrated monthly pass product accepted on some portion of either of these systems and used by an appreciable number of existing BART or Golden Gate Transit riders is likely to result in ridership gains but fare revenue losses. To maintain revenue neutrality, alternatives for integrated fare products involving BART and Golden Gate Transit may be to use a relatively high monthly pass breakeven point (i.e., price the monthly pass at roughly 44 times the cash fare less currently-offered discounts), cap the number of regional trips that can be made per month on a regional pass, base the monthly pass price on cash fares for the maximum distance a rider could travel in two fare zones, and/or leverage the "BART Plus" approach to limit the risk of fare revenue loss for BART and Golden Gate Transit, the regional operators that do not offer monthly passes. However, with regard to the BART Plus approach, it is important to note that RM2 specifies that the regional fare product is to be a monthly pass.

3.3 EXISTING INTER-OPERATOR FARE PRODUCTS

The primary rationale for changing or eliminating existing inter-operator fare products (i.e., transfers or passes) is to simplify them and reduce inconsistencies in the discounts provided across operators and geographies. Another reason would be to eliminate existing products (such as the Caltrain/SamTrans/SCVTA agreement) that could undercut a

regional product. However, making wholesale changes to existing products will not keep each operator revenue neutral (even if the region overall is revenue neutral), unless a regional fund is created to keep operators whole.

Eliminating all or most existing inter-operator fare products, introducing a discounted regional fare product, and creating a regional fund that can be used to keep operators whole, would require significant changes to existing fare policies in the Bay Area and is described further in Section 4 - Ridership and Revenue Impacts. Other regions with multiple transit providers have introduced regional pass programs, using various models as discussed in the appendix to this report. Two of particular interest for the Bay Area are Los Angeles' EZ Transit Pass and Seattle's PugetPass, both of which are accepted by transit operators throughout the respective regions[4] and have explicitly addressed operators' concerns for retaining revenue neutrality by guaranteeing that operators would be reimbursed at the rate of an average fare per boarding for each regional pass boarding. Both programs are based on a monthly pass and in Seattle, operators restructured their fares so that all cash fares are denominated in $0.25 increments. PugetPasses are available for each cash fare increment and are priced at 36 times the cash fare (e.g., Sound Transit's 2-zone cash fare is $2.50 – the applicable PugetPass is the $2.50 pass, which is priced at $90: $2.50 x 36). In addition, funds were created for both the Los Angeles and Seattle programs to ensure that revenue would be available to back the guarantee in the event that revenues from regional pass sales were insufficient. In Los Angeles, pass sales have generated sufficient revenues to keep participating operators whole. In Seattle, the fund was used to provide $14 million in reimbursements over four years, but the operators have adopted a new revenue sharing model and now share only the revenue available from pass sales.

[4] *Los Angeles' EZ Transit Pass is accepted by 24 operators throughout Los Angeles County, including the Los Angeles County Metropolitan Transportation Authority and 11 of the 16 municipal operators. The Seattle region's PugetPass is accepted by five transit operators in the three-county area that is served by Sound Transit, the regional provider .*

4.0 Regional Fare Alternatives

In discussions with the Task Force, a number of integrated fare alternatives were identified and refined and were deemed to merit further analysis. Three concepts (and variations on them) were evaluated:

- Concept 1: Regional Monthly Pass – a monthly pass valid between specific zones (residence zone and work zone), including travel on local feeder services in the origin zone, the regional operator, and local distributor services in the destination zone. Variations on this concept would reduce the revenue risk by capping the number of trips allowed on the regional service or by limiting local trips to those linked to a trip on a regional provider.
- Concept 2: Regional Pass Plus – building on the BART Plus concept, the regional operator portion of this alternative could be a stored value ticket, stored trip ticket, or pass-based product. It would also provide a pass valid for local travel in specific origin and destination zones. A variation on this concept would further reduce revenue risk by limiting local trips to those linked to a trip on a regional provider.
- Concept 3: Single Ride Discount – a fare valid for a single trip between two specific zones, including travel on local feeder service(s) in the origin zone, a regional operator, and local distributor service(s) in the destination zone.
- Concept 4: Trip Value Monthly Pass – a monthly pass valid for transit trips up to and including a specified cash fare, or trip value.

Table 4-1 shows the advantages and disadvantages of each of these alternatives, based on work prepared by the Booz Allen team as well as direct input from and discussions with Bay Area operators and the Task Force.

Table 4-1: Regional Fare Alternatives

Product	Operator Applicability			Advantages	Disadvantages
	Feeder	Regional	Distributor		
Concept 1A: Unlimited Regional Monthly Pass, Unlinked Trips	Unlimited rides	Unlimited rides between two zones	Unlimited rides	▸ Convenient ▸ No counting for riders ▸ Easy to administer ▸ Savings for very frequent transit users ▸ More flexible for riders than other pass options	▸ Relatively expensive, compared to other options, because it is flexible ▸ Risky for regional operators that don't offer a monthly pass ▸ Risky for high volume operators ▸ Customers may pay extra because pass is priced for the most expensive trip possible among different operators by zone pair
Concept 1B: Unlimited Regional Monthly Pass, Linked Trips	Unlimited rides linked to regional ride	Unlimited rides between two zones	Unlimited rides linked to regional ride	▸ Accommodates commuters ▸ Low risk for local operators	▸ Does not cover ancillary (e.g., mid-day) trips ▸ Still risky for regional operators that don't have a monthly pass ▸ Linked trip requirements may be confusing
Concept 1C: Limited Regional Monthly Pass	Unlimited rides	Rides capped for commute (e.g., 40-44 trips per month)	Unlimited rides	▸ Less expensive than monthly pass ▸ Easy travel in home and work zones	▸ Potentially complex revenue distribution ▸ All risk with local operators ▸ More restrictive than unlimited regional monthly pass options ▸ Riders risk exceeding cap on regional operator trips

Product	Operator Applicability			Advantages	Disadvantages
	Feeder	Regional	Distributor		
Concept 2A: Regional Pass Plus, Unlinked Trips	Unlimited rides	Could be stored value or trip- or pass-based	Unlimited rides	▸ Builds on existing BART Plus concept[5] ▸ Avoids complexities associated with geographic zones	▸ Not consistent with RM2 legislation (not based on a regional zone structure; may not be a monthly pass) ▸ Does not tie products into a single regional scheme ▸ Riders risk exceeding cap on regional operator trips
Concept 2B: Regional Pass Plus, Linked Trips	Unlimited rides linked to regional ride	Could be stored value or pass-based	Unlimited rides linked to regional ride	▸ Avoids complexities associated with geographic zones[6] ▸ Low risk for local operators	▸ Not consistent with RM2 legislation (not based on a regional zone structure; may not be a monthly pass) ▸ Does not tie products into a single regional scheme ▸ Doesn't cover ancillary (mid-day, etc.) trips ▸ Potentially confusing to riders ▸ Riders risk exceeding cap on regional operator trips

[5] *BART Plus enables integrated fare payment by providing a stored value BART ticket combined with a flash pass valid on connecting Bay Area operators.*

[6] *Limiting local trips to those that are linked to the regional trip may help to reduce the complications of geographic fare zone, which may give rise to confusion among riders. Some of the potential sources of confusion include: (1) since fares will be purchased between specific zones, riders will need to understand that eligible trips are restricted to travel between specified zones; (2) stops in intermediate zones (which are currently permitted on Caltrain) may not be allowed; (3) fare zones cut through some local service areas (e.g., Silicon Valley and San Jose cut through SCVTA service area) and may create complications for travel on local operators.*

Product	Operator Applicability			Advantages	Disadvantages
	Feeder	Regional	Distributor		
Concept 3: Single Ride Discount	One ride linked to regional ride	One ride	One ride linked to regional ride	▸ Rider doesn't need to choose in advance ▸ Marketable convenience	▸ Not consistent with RM2 legislation (application broader than regular commuters; not a monthly pass) ▸ May not provide net financial savings for regular commuters
Concept 4: Trip Value Monthly Pass	Unlimited rides for specified trip values	Unlimited rides for specified trip values	Unlimited rides for specified trip values	▸ Convenient ▸ No counting for riders ▸ Easy to administer ▸ Easy to understand ▸ Savings for very frequent transit users ▸ Customers avoid paying extra because pass is priced to the cash fare of service used instead of the most expensive trip possible among different operators by zone pair ▸ Riders can "upgrade" by paying cash fare difference	▸ Risky for high volume and regional operators that don't offer a monthly pass ▸ Numerous trip values used in Bay Area ▸ Technically not consistent with RM2 legislation (not based on a regional zone structure), but preserves current zone structures of regional operators

In addition:

- Two of the original concepts described in the Background Report Addendum (February 5, 2008) were discarded from further consideration. The Accumulator was believed to be too complex given the number of transit operators in the region. The High Load Bonus was not believed to be equitable for riders.
- Another concept, which would allow stops on regional providers in intermediate zones, can be evaluated as a variation of other concepts.
- Another concept, a Universal Pass, could also be implemented in conjunction with other concepts but is not a focus of the alternatives analysis.

Table 4-2 provides a high level comparison of the four basic concepts and their variations.

Table 4-2: Comparison of Integrated Fare Concepts

Concept	Simplicity; Ease of Marketing	Appeal to Regular Commuters	Appeal to Infrequent Riders	Appeal to Potential New Riders	Overall Ridership Potential (a)	Revenue Risk: Regional Operators	Revenue Risk: Local Operators	Overall Risk of Revenue Loss (a)
1A: Monthly Pass, Unlimited Unlinked Trips	●	●	◔	◕	●	**M**	**M**	**M**
1B: Monthly Pass, Unlimited Linked Trips	◑	◕	◔	◑	◕	**M**	**L**	**L**
1C: Limited Regional Pass	◕	◕	◔	◑	◕	**L**	**M**	**L**
2A: Regional Pass Plus, Unlinked Trips	◕	●	◔	◕	●	**L**	**M**	**L**
2B: Regional Pass Plus, Linked Trips	◑	◕	◔	◑	◕	**L**	**L**	**L**
3: Single Ride Discount	◕	◑	●	◕	◕	**M**	**M**	**M**
4: Trip Value Monthly Pass	●	●	◔	◕	●	**M**	**M**	**M**
Most Applicable ● Least Applicable ○						**H = high**	**M=medium**	**L = low**

Notes:

(a) Because transit riders are sensitive to price and changes in price, overall ridership and fare revenue impacts can be controlled through specific product pricing. Reducing prices can be expected to increase ridership and vice versa; increasing fares can be expected to reduce ridership. It is therefore possible to use pricing to manage revenue risk to operators.

Each of the alternative regional fare concepts carries with it some implied pricing constraints, as described below. For the pass-based concepts (1A, 1B, and 1C), these constraints were defined in the Background Report:

- **Floor Pricing Constraint:** A pass should be priced no lower than the lowest fare on the most expensive of the component operators. This ensures that the integrated fare product will not be purchased instead of an existing fare product at a lower cost. For example, a monthly pass for trips between Livermore and Balboa Park should not be priced lower than the amount a daily commuter could expect to pay in a month for the BART portion of that trip, or $5.50 (one way fare) * 44 (average monthly one way trips for a commuter) – 6.25% "high value" discount = $226.90.
- **Ceiling Pricing Constraint:** A pass should be priced no higher than the sum of the least expensive fares of all the component operators. This ensures that it provides a financial advantage for riders to use it when transferring. The least expensive fare for a component operator will typically be a monthly pass product, with the primary exceptions of BART and Golden Gate Transit which do not offer monthly passes. For example, a monthly pass for trips between Livermore and Balboa Park should not be priced higher than ($53.00 [Wheels monthly pass] + $5.50 * 44 [BART fare] – 6.25% "high value" discount + $45.00 [SFMTA monthly pass]) = $324.90.
- **Effective Ceiling Pricing Constraint:** A third consideration is the effective ceiling, which is the sum of the lowest possible monthly commute costs for the regional portion plus the cheapest local portion. In the case of trips between Livermore and Balboa Park, this would be the BART fare ($5.50 * 44 - 6.25% "high value" discount = $226.90) plus an SFMTA (Muni) monthly pass ($45.00) for a total of $271.90. If the integrated fare product is priced higher than this level it will make it uneconomical to a large portion of riders transferring between two of the operators.

In certain cases, a product already exists that provides riders with financial savings relative to the sum of the component operators' passes. For example, for trips between Livermore and San Francisco, riders may use BART Plus which is accepted as a monthly flash pass on both Wheels and SFMTA. For BART Plus riders who purchase $15.00 to $50.00 of BART stored value per half-month, the incremental cost of the monthly pass on participating connecting operators ranges from $21.00 to $23.00 per half-month (or $42.00 to $46.00 per month) depending on the amount of BART stored value purchased. The value of the BART Plus "Last Ride Bonus" on BART varies, but is approximately eight percent – and for analysis purposes, is roughly the same as the BART high value discount of 6.25 percent. Therefore, the ceiling and

effective ceiling pricing constraint could actually be as low as $268.90 per month, or $226.90 in BART fares + $42.00 for the flash pass.

In other cases, particularly taking into consideration existing discounted products, the Floor Pricing Constraint might be above the Effective Ceiling or Ceiling Pricing Constraints. A key example is the trip between Millbrae and San Francisco. The Floor Pricing Constraint for this trip would be the BART cash fare at 44 trips per month, with the 6.25% high value discount ($4.00 * 44 – 6.25% high value discount = $165.00). The Effective Ceiling Pricing Constraint would be the Caltrain 2-zone pass, which includes local fare credit on Samtrans ($106.00). The Ceiling Pricing Constraint would be the Caltrain 2-zone pass plus the SFMTA monthly pass at a $5 discount ($106.00 + $40.00 = $146.00). A monthly pass priced below $165.00 would undercut the current single-agency BART fare. Yet if the pass was priced above $106.00, it would be more expensive than what a daily Caltrain/SamTrans commuter currently pays. This is just one of several examples throughout the Bay Area where it may not be practical to introduce a new regional fare product that adheres to Effective Ceiling or Ceiling constraints.

One of the fare study objectives defined by the TMG and the Task Force is that "the integrated fare product should be revenue neutral and should not adversely affect revenue, expenses or service quality of any of the participating agencies." The broad implication of this objective is that the integrated fare product should not be designed to provide discounts to a large number of existing riders. Because transit fare elasticities tend to be inelastic (i.e., discounted fare products tend to increase ridership and decrease fare revenue), providing discounted fares rarely brings enough fare revenue from new riders to compensate for the revenue loss from existing riders shifting to the lower fares. If an existing market of riders who use both a regional operator and a local operator is relatively large, this market should be recognized as one of the pricing constraints, even if this market is the most expensive of the components. A key example is the estimated 20,000 weekday riders who use both BART and AC Transit. AC Transit, which is not currently a BART Plus participant, has a local monthly pass price of $70.00 – significantly higher than BART Plus pricing.

To minimize fare revenue loss from the regional fare product (as clarified by the TMG on April 16, 2008), the Effective Ceiling Pricing Constraint and Ceiling Pricing Constraint are revised as follows:

- **Effective Ceiling Pricing Constraint:** The Effective Ceiling Pricing Constraint is equal to the monthly cost of making trips on the regional operator and the single most expensive feeder/distributor operator, taking into account existing inter-operator fare discounts. For example, a monthly pass for trips between Oakland Coliseum and Balboa Park should not be priced higher than ($3.90 * 44 [BART fare] - 6.25% "high value" discount + $70.00 [AC Transit monthly pass]) = $230.90.
- **Ceiling Pricing Constraint:** The Ceiling Pricing Constraint is equal to the monthly cost of making trips on the regional operator, the single most expensive feeder operator, and the single most expensive distributor operator, taking into account existing inter-operator fare discounts. For example, a monthly pass for trips between Oakland Coliseum and Balboa Park should not be priced higher than ($3.90 * 44 [BART fare] – 6.25% "high value" discount + $70.00 [AC Transit monthly pass] + $42.00 [BART Plus cost to include SFMTA]) = $272.90.

In this particular example, the Effective Ceiling and Ceiling Pricing Constraints could be reduced by about $4.00 since AC Transit riders paying cash fares would pay $1.50 per trip, or about $1.50 x 44 = $66.00 a month (taking into account existing BART-to-bus and bus-to-BART cash fare transfer discounts) instead of $70.00 for the local monthly pass. As such, the Effective Ceiling Constraint would be $226.90 and the Ceiling Constraint would be $268.90.

The Ceiling Pricing Constraint may be disregarded in most cases if only a small number of riders use a feeder operator, a regional operator, and a distributor operator to complete their trips. As such, the Effective Ceiling Pricing Constraint will generally serve as a good estimate for a monthly pass price that is roughly revenue-neutral. The Effective Ceiling Pricing Constraint could be undercut without appreciably impacting fare revenue only if the existing ridership base for that market is quite low or if the potential for new riders as a result of providing the discount is particularly strong. This would need to be assessed on a case-by-case basis.

Given the number of Bay Area transit operators and the variety of rider travel patterns, one of the key challenges in evaluating each of the alternatives is to define the pricing constraints for each concept. This process is described in the next section.

5.0 Pricing Constraints

This section describes the pricing constraints for the integrated fare concepts defined in Section 3.0:

- Concepts 1A, 1B, and 1C: Regional Monthly Pass.
- Concepts 2A and 2B: Regional Pass Plus.
- Concept 3: Single Ride Discount.
- Concept 4: Trip Value Monthly Pass.

It is noted that since commuters comprise the target market and the focus of the study, pricing has been based on adult fares and it is assumed that the integrated fare product will be priced for the full fare adult market. An integrated fare product for seniors, youths and persons with disabilities is also possible, but is beyond the scope of this study. Approximately 92 percent of inter-operator trips are made by adults. Therefore, the ridership data used in the analysis have been reduced by eight percent to eliminate other rider categories for which other discounts are already available.

5.1 REGIONAL MONTHLY PASS PRICING CONSTRAINTS

The pricing constraints for this product are specific to each regional operator:

- BART as Regional Operator – Markets with BART serving as the regional operator
- Caltrain as Regional Operator – Markets with Caltrain serving as the regional operator
- Golden Gate Transit as Regional Operator – Markets with Golden Gate Transit serving as the regional operator
- Other Agency as Regional Operator – Markets with other agencies (AC Transit, SamTrans, ferry service) serving as the regional operator.

Pricing for each integrated fare concept is based on information from each market segment. While SFMTA qualifies as a regional operator[7], it is highly unlikely that a new integrated fare product could be priced to have any value for riders who use SFMTA as a regional service. With the $1.50 cash fare and the $45.00 monthly pass, SFMTA's regional services are priced well below those of any other regional service. Therefore, the ridership and fare revenue implications for SFMTA will be based solely on SFMTA's role as a feeder/distributor operator.

5.1.1 BART as Regional Operator

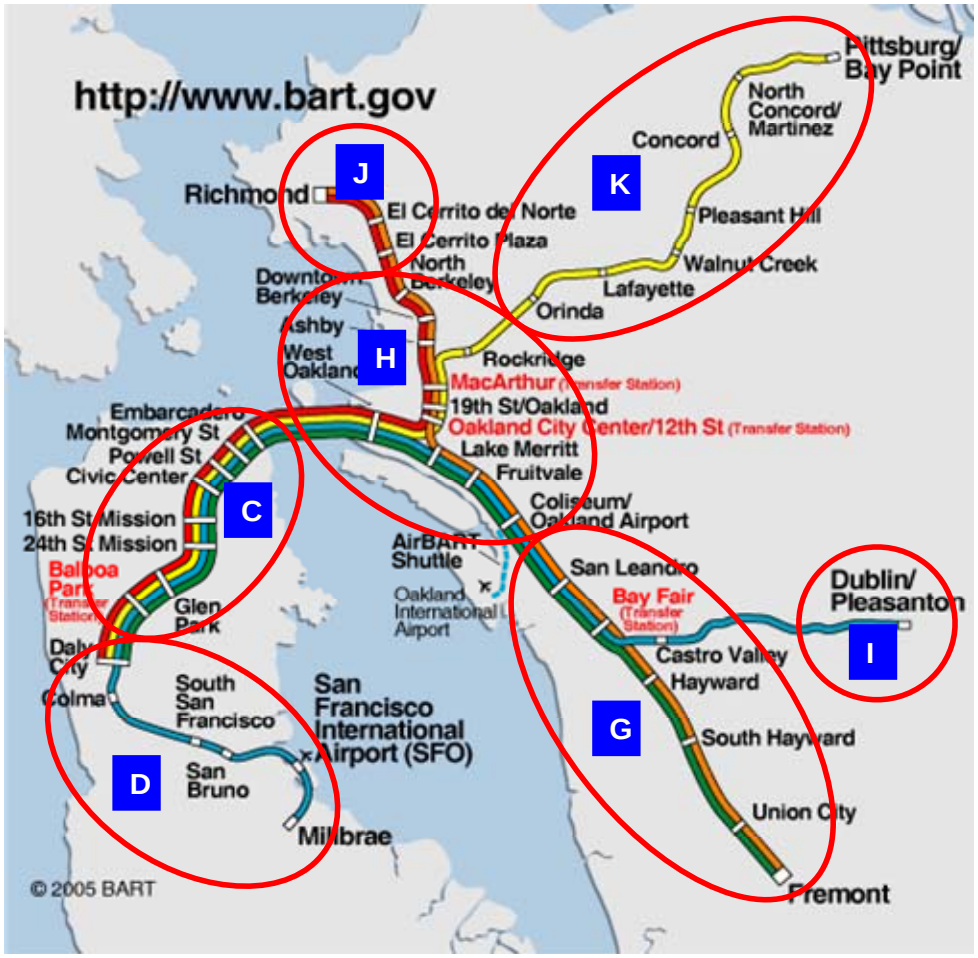
BART has the most significant regional operator role of any operator in the Bay Area. BART is estimated to carry about 219,000 (78 percent) of the roughly 279,000 daily transit trips in the Bay Area that cross county lines. BART is also estimated to be involved in about 80,000 (72 percent) of the roughly 111,000 daily inter-operator transfers that occur among transit operators in the Bay Area. In order to introduce a regional monthly pass product involving BART, it is necessary to group existing BART stations into zones. Figure 5-1 (on the following page) shows the proposed grouping of BART stations into fare zones, based on the zone map provided in Figure 3-1.

The integrated fare product should not undercut the revenue generated by the existing BART fare structure, as mandated by the TMG on April 16, 2008. The *Pass Program Background Report*, prepared by BART in September 2006, estimated that a BART-only monthly pass product based on a 40-trip multiple would result in a 1 percent ridership gain and a 2 percent fare revenue loss (a reduction of about $5.4 million annually). From BART's perspective, an integrated fare product based on a similar pricing structure would not be feasible.

The BART 2006 Customer Satisfaction Survey found that 58 percent of BART riders use BART five or more days per week, which translates to about 44 trips per month (and possibly more for a subset of riders). Therefore, to avoid the risk of fare revenue loss from existing riders who use the BART system, a zone-based regional monthly pass that includes BART should adhere to the following principles:

[7] *SFMTA qualifies as a regional operator because it provides services that crosses the county line into San Mateo County, operates rail service, and operates service over a bridge. Practically speaking, SFMTA provides an important role in facilitating regional trips as a feeder and distributor system in San Francisco, which is the destination of the majority of transit trips in the Bay Area.*

Figure 5-1: BART Fare Zones



- The regional component of the zone-based monthly pass should be priced at or higher than 44 times the cash fare, using the BART adult fare table. About 40 percent of BART riders receive the 6.25 percent "high value" BART discount, so a high percentage of existing riders taking more than 44 trips per month on BART are likely receiving that discount. Therefore, a 44-trip multiple with a 6.25 percent discount appears reasonable from the perspective of minimizing fare revenue loss.

- The regional component of the zone-based monthly pass should be priced based on BART's furthest station-to-station distance between zones. For example, an East Contra Costa (Zone K) – San Francisco (Zone C) monthly pass should use Pittsburg-Bay Point – Balboa Park as the stations for pricing the regional component.

Table 5-1 shows the pricing matrix for the regional component of the integrated fare (i.e., the floor pricing constraint) based on these principles and BART's existing fare structure.

Table 5-1: Floor Pricing Constraints with BART as Regional Operator

Zone 1	Zone 2	Maximum BART Cash Fare	Floor Pricing Constraint (44 trip multiple; 6.25% discount)
San Francisco	West Contra Costa	$4.30	$177.40
San Francisco	East Contra Costa	$5.85	$241.30
San Francisco	Central Alameda	$3.90	$160.90
San Francisco	Tri-Valley	$5.50	$226.90
San Francisco	Peninsula	$5.35	$220.70
San Francisco	South Alameda	$5.55	$228.90
West Contra Costa	East Contra Costa	$4.60	$189.80
West Contra Costa	Central Alameda	$2.90	$119.60
West Contra Costa	Tri-Valley	$4.55	$187.70
West Contra Costa	Peninsula	$6.40	$264.00
West Contra Costa	South Alameda	$4.55	$187.70
East Contra Costa	Central Alameda	$4.35	$179.40
East Contra Costa	Tri-Valley	$6.00	$247.50
East Contra Costa	Peninsula	$8.00	$330.00
East Contra Costa	South Alameda	$6.00	$247.50
Central Alameda	Tri-Valley	$4.05	$167.10
Central Alameda	Peninsula	$6.05	$249.60
Central Alameda	South Alameda	$4.10	$169.10
Tri-Valley	Peninsula	$7.65	$315.60
Tri-Valley	South Alameda	$4.10	$169.10
Peninsula	South Alameda	$7.65	$315.60

Pricing is rounded to $0.10 increments.

For particular origin-destination pairs, the floor pricing constraint may be based on an operator other than BART (i.e., ferry operators). This is discussed below in the "Other Agencies as Regional Operator" subsection.

The next step is to identify the appropriate feeder/distributor operator market segments with BART serving as the regional operator, which will determine the ceiling pricing constraints. Table 5-2 shows the local operators that connect with BART, the estimated number of inter-operator transfers per weekday, and the current discount levels provided to riders who make inter-operator transfers (separately for cash riders and pass riders, and for BART and the local operators).

Table 5-2: Feeder/Distributor Operators with BART as Regional Operator

Local Operator	Zone	Estimated Weekday Transfers	Existing Discount: Cash Riders (per round trip)		Existing Discount: Pass Riders (per month)	
			Savings on Regional	Savings on Local	Savings on Regional	Savings on Local
AC Transit	Multiple	20,000	none	$0.50	none	none
Benicia	East Contra Costa	48	none	none	BART Plus (limited; upgrade required)	
County Connection	Multiple	3,400	none	$0.90	BART Plus (up to $11 pass savings)	
Fairfield Suisun	Multiple	99	none	none	none	none
SFMTA	San Francisco	51,000	none	$0.50	BART Plus (up to $3 pass savings)	
Rio Vista	East Contra Costa	*<10*	none	none	BART Plus (limited; upgrade required)	
SamTrans	Peninsula	6,200	none	none	BART Plus (up to $6 pass savings)	
SCVTA	South Alameda	*200*	none	$1.75	BART Plus (limited; upgrade required)	
Tri Delta	Multiple	*1,800*	none	$0.50	BART Plus (limited savings)	
Union City	South Alameda	340	none	$1.00	BART Plus (limited savings)	
Vallejo Transit	West Contra Costa	*800*	none	none	none	none
WestCAT	West Contra Costa	1,200	none	$0.50	BART Plus (up to $2 pass savings)	
WHEELS	Tri Valley	2,065	none	$0.90	BART Plus (up to $11 pass savings)	

Source: Agency data or best estimates based on understanding of regional travel patterns. Estimated weekday transfer numbers in italics represent best estimates; other numbers are based on agency data.

Does not include transfers between BART and other regional operators (Caltrain, Golden Gate Transit, Dumbarton Express, ferries). The number of riders who transfer between multiple regional operators is small enough that it is not necessary to reflect them in the pricing constraints.

Key findings from Table 5-2 are as follows:

- The local operators that have the most inter-operator transfers with BART are SFMTA (51,000 per weekday), AC Transit (20,000), and SamTrans (6,200).
- Discounts for cash riders are currently available for 7 of the 13 local operators that connect with BART, ranging from $0.50 to $1.75 per round trip. For SFMTA and AC Transit, which have the most transfers with BART, the cash discount is $0.50 per round trip.
- Discounts for pass riders are currently available for 10 of the 13 local operators that connect with BART, through the BART Plus program. Pass savings are based on a BART Plus flash pass cost of $42.00 per month, which is the lowest priced flash pass currently available through the program. For participating local operators that have a local monthly pass priced at less than $42.00 per month (i.e., Tri Delta, Union City), BART Plus provides savings only for riders who use multiple local operators. For three of the participants (Benicia Transit, Rio Vista, and SCVTA), BART Plus savings are limited in that express upgrade charges still apply on most of their routes that connect with BART.
- Three connecting local operators (AC Transit, Fairfield Suisun Transit, and Vallejo Transit) are not currently participating in the BART Plus program. AC Transit withdrew from BART Plus in September 2003 (FY2004).

By combining the information from Tables 5-2 and 5-3, the ceiling pricing constraints for each of the zonal pairs for which BART serves as the regional operator can be determined:

- For the zones served by AC Transit as a local operator, AC Transit is the most expensive local operator. The Effective Ceiling Pricing Constraint is equal to BART's Floor Pricing Constraint plus $66.00 (or $1.50 times 44, based on AC Transit's one-way fare of $1.75 and the existing $0.25 inter-operator transfer discount; $66.00 is less expensive than the cost of AC Transit's local monthly pass of $70.00).
- Also for the zones served by AC Transit as a local operator, the Ceiling Pricing Constraint is equal to the Effective Ceiling Pricing Constraint plus $42.00, or the monthly cost associated with the BART Plus flash pass.
- For other zones, the Effective Ceiling Pricing Constraint is equal to BART's Floor Pricing Constraint plus $42.00, or the monthly cost associated with the BART Plus flash pass. The Ceiling Pricing Constraint is the same as the Floor Pricing

Constraint, because the primary local operators in these zones are part of BART Plus (Fairfield Suisun Transit connects with BART but is primarily focused on travel to/from Solano County. Benicia Breeze and Rio Vista Transit also focus primarily on travel to/from Solano County and are also in BART Plus, but charge express fare upgrades to BART Plus riders).

- Fairfield-Suisun Transit and Vallejo Transit (and AC Transit) are not part of the BART Plus Program. However, both of these operators focus on travel between the BART system and Solano County, which is included in Zone L (Napa/Solano) and is not served by BART. In order to incorporate this zone into the pricing constraints, the fare structures of these agencies will determine the ceilings.
- SCVTA connects with BART in South Alameda, but primarily focuses on travel between the BART system and Santa Clara County via express buses serving Zone E (Silicon Valley) and Zone F (San Jose), which are outside BART's service area. SCVTA has indicated that for its system, the area should not be split and these two zones should be considered one zone. To incorporate Santa Clara County into the pricing constraints, the relevant fare for most zones is the regional BART fare to/from South Alameda, plus $42.00 [BART Plus monthly pass] + $1.75 x 44 [SCVTA express bus surcharge] = $119.00.
- Connections between BART and other regional operators (Caltrain, Golden Gate, ferry services) are also possible. However, because of the high fares associated with such trips, it is likely that such trips should generally be reserved for the Universal Pass.

Table 5-3 shows the Effective Ceiling and Ceiling Pricing Constraints for each of the zonal pairs that BART serves as the regional operator, based on the previous discussion.

Table 5-3: Effective Ceiling and Ceiling Pricing Constraints with BART as Regional Operator

Zone 1	Zone 2	Floor Pricing Constraint	Additional Fare to Reach Effective Ceiling	Effective Ceiling Pricing Constraint	Additional Fare to Reach Ceiling	Ceiling Pricing Constraint
San Francisco	West Contra Costa	$177.40	$66.00	$243.40	$42.00	$285.40
San Francisco	East Contra Costa	$241.30	$42.00	$283.30	$0.00	$283.30
San Francisco	Central Alameda	$160.90	$66.00	$226.90	$42.00	$268.90
San Francisco	Tri-Valley	$226.90	$42.00	$268.90	$0.00	$268.90
San Francisco	Peninsula	$220.70	$42.00	$262.70	$0.00	$262.70
San Francisco	South Alameda	$228.90	$66.00	$294.90	$42.00	$336.90
West Contra Costa	East Contra Costa	$189.80	$66.00	$255.80	$42.00	$297.80
West Contra Costa	Central Alameda	$119.60	$66.00	$185.60	$42.00	$227.60
West Contra Costa	Tri-Valley	$187.70	$66.00	$253.70	$42.00	$295.70
West Contra Costa	Peninsula	$264.00	$66.00	$330.00	$42.00	$372.00
West Contra Costa	South Alameda	$187.70	$66.00	$253.70	$42.00	$295.70
East Contra Costa	Central Alameda	$179.40	$66.00	$245.40	$42.00	$287.40
East Contra Costa	Tri-Valley	$247.50	$42.00	$289.50	$0.00	$289.50
East Contra Costa	Peninsula	$330.00	$42.00	$372.00	$0.00	$372.00
East Contra Costa	South Alameda	$247.50	$66.00	$313.50	$42.00	$355.50
Central Alameda	Tri-Valley	$167.10	$66.00	$233.10	$42.00	$275.10
Central Alameda	Peninsula	$249.60	$66.00	$315.60	$42.00	$357.60
Central Alameda	South Alameda	$169.10	$66.00	$235.10	$42.00	$277.10
Tri-Valley	Peninsula	$315.60	$42.00	$357.60	$0.00	$357.60
Tri-Valley	South Alameda	$169.10	$66.00	$235.10	$42.00	$277.10
Peninsula	South Alameda	$315.60	$66.00	$381.60	$42.00	$423.60
Napa/Solano	San Francisco	$241.30	$85.60	$326.90	$42.00	$368.90
Napa/Solano	West Contra Costa	$70.00	$134.00	$204.00	$66.00	$270.00
Napa/Solano	East Contra Costa	$61.90	$134.00	$195.90	$42.00	$237.90
Napa/Solano	Central Alameda	$179.40	$85.60	$265.00	$66.00	$331.00
Napa/Solano	Tri-Valley	$247.50	$85.60	$333.10	$42.00	$375.10
Napa/Solano	Peninsula	$330.00	$85.60	$415.60	$42.00	$457.60
Napa/Solano	South Alameda	$247.50	$85.60	$333.10	$66.00	$399.10
Santa Clara County	Solano Napa	$333.10	$119.00	$452.10	$0.00	$452.10

Zone 1	Zone 2	Floor Pricing Constraint	Additional Fare to Reach Effective Ceiling	Effective Ceiling Pricing Constraint	Additional Fare to Reach Ceiling	Ceiling Pricing Constraint
Santa Clara County	San Francisco	$228.90	$119.00	$347.90	$0.00	$347.90
Santa Clara County	West Contra Costa	$187.70	$119.00	$306.70	$66.00	$372.70
Santa Clara County	East Contra Costa	$247.50	$119.00	$366.50	$0.00	$366.50
Santa Clara County	Central Alameda	$169.10	$119.00	$288.10	$66.00	$354.10
Santa Clara County	Tri-Valley	$169.10	$119.00	$288.10	$0.00	$288.10
Santa Clara County	Peninsula	$315.60	$119.00	$434.60	$0.00	$434.60
Santa Clara County	South Alameda	$129.90	$119.00	$248.90	$66.00	$314.90

It is believed that the very high priced transit markets currently have relatively low demand. Therefore, it should be possible to introduce a Universal Pass at roughly $400 that allows for travel throughout the Bay Area on all participating operators. Any cell priced above $400 can be reduced to the $400 Universal Pass price. It may be possible to charge a little less or a little more than $400, but based on ridership, current fare structures and pricing constraints, it is expected that the price of the Universal Pass would be on the order of approximately $400.

An area of particular concern is the directionality of travel to/from certain zones. This is most notable for riders traveling to/from Santa Clara County, which can be reached via either the Peninsula or the East Bay. For example, a trip between Santa Clara County and Peninsula could be made by using BART (SFIA BART – Fremont BART at $7.65 per trip x 44 trips -6.25% "high value" discount = $315.60) and SCVTA express ($42.00 for BART Plus + $1.75 express surcharge per trip x 44 trips = $119.00) at a total monthly cost of $434.60. In pricing the regional monthly pass product, it is necessary to define the product functionality on the basis of a distinct set of operators (as opposed to just geographic zones) in order to avoid confusion and abuse pertaining to directionality of travel. If a trip between Santa Clara County and Peninsula as described is deemed to be an unlikely way to make such a trip, it should specifically be excluded from the functionality of the product.

5.1.2 Caltrain as Regional Operator

Caltrain has defined fare zones, an existing monthly pass product, and relatively few connecting feeder/distributor operators. Figure 5-2 shows the existing Caltrain fare zones.

Figure 5-2: Existing Caltrain Fare Zones

The Caltrain fare zones differ from the proposed regional fare zones in Figure 3-1 in two primary respects:

- The regional fare zone boundary between San Francisco and the Peninsula is defined at the San Francisco/San Mateo county line, which puts Caltrain's South San Francisco and San Bruno stations in the same regional fare zone as the Millbrae station instead of with the San Francisco station, where they are in the Caltrain zone structure.
- The regional fare zone for San Jose combines all Caltrain stations south of Sunnyvale, from Lawrence to Gilroy, into a single fare zone. This is a problem for the regional fare because in Caltrain's fare structure these stations are in three fare zones (e.g., a 4-zone monthly pass between San Jose and San Francisco costs $198.75; a 6-zone monthly pass between Gilroy and San Francisco costs $291.50). Using the 4-zone monthly pass price for the regional component of a regional fare to/from San Francisco will not be acceptable because it will undercut the Gilroy-San Francisco fare and will not be revenue neutral. Therefore, the regional fare pricing should use the existing Caltrain 6-zone monthly pass price as the regional component, despite the fact that this will limit the product's potential ridership base. Alternatively, a separate South Santa Clara County fare zone could be created, but doing so would further subdivide the SCVTA service area into three zones instead of the two currently defined.

Caltrain monthly pass riders currently have discounted fares on the three primary connecting local operators: SFMTA, SamTrans and SCVTA. Caltrain monthly passes for two or more zones are accepted as local fare credit on SamTrans and SCVTA, and entitle the rider to a $5 discount on SFMTA's monthly Fast Pass. Table 5-4 shows Caltrain's connecting local operators, the estimated number of inter-operator transfers per weekday, and the current discount levels provided to riders who make inter-operator transfers.

Table 5-4: Feeder/Distributor Operators with Caltrain as Regional Operator

Local Operator	Zone	Estimated Weekday Transfers	Existing Discount: Cash Riders (per round trip)		Existing Discount: Pass Riders (per month)	
			Savings on Regional	Savings on Local	Savings on Regional	Savings on Local
SFMTA	San Francisco	15,000	none	none	None	$5 off SFMTA pass
SamTrans	Multiple	2,450	none	none	None	local fare credit (~$48)
SCVTA	South Alameda	4,000	none	none	None	local fare credit (~$61.25)

Source: Agency data.

Does not include transfers between BART and other regional operators (Caltrain, Golden Gate Transit, Dumbarton Express, ferries). The number of riders who transfer between multiple regional operators is small enough that it is not necessary to reflect them in the pricing constraints.

Table 5-5 shows the Effective Ceiling and Ceiling Pricing Constraints for each of the zonal pairs which Caltrain serves as the regional operator, based on existing monthly pass prices and inter-operator fare agreements.

Table 5-5: Effective Ceiling and Ceiling Pricing Constraints with Caltrain as Regional Operator

Zone 1	Zone 2	Floor Pricing Constraint	Additional Fare to Reach Effective Ceiling	Effective Ceiling Pricing Constraint	Additional Fare to Reach Ceiling	Ceiling Pricing Constraint
San Francisco	Peninsula	$106.00	$40.00	$146.00	$0.00	$146.00
San Francisco	Silicon Valley	$152.50	$40.00	$192.50	$0.00	$192.50
San Francisco	San Jose	$291.50	$40.00	$331.50	$0.00	$331.50
Peninsula	Silicon Valley	$106.00	$0.00	$106.00	$0.00	$106.00
Peninsula	San Jose	$245.25	$0.00	$245.25	$0.00	$245.25
Silicon Valley	San Jose	$198.75	$0.00	$198.75	$0.00	$198.75

Travel between the South San Francisco/San Bruno stations and stations further south are discounted relative to existing single-operator Caltrain pricing in this table. This is a concern that needs to be resolved.

Riders going to/from San Francisco have a choice between Caltrain and SamTrans express service from the Palo Alto station and points north, and have a choice between Caltrain, BART, and SamTrans express from the Millbrae station and

north. Possible products designed specifically for the choice rider (i.e., riders who have a choice between more than one regional transit service for their daily commute) in these markets, as well as the choice market between BART and AC Transit Transbay service, will be provided later in this section.

5.1.3 Golden Gate Transit as Regional Operator

Golden Gate Transit's fare structure includes fare zones but no monthly pass. Frequent Golden Gate Transit riders have the option to purchase 20-trip ticket books, which provide a 20 percent discount relative to the cash fare. Therefore, the price of 44 Golden Gate Transit trips using the discounted 20-trip ticket book can be thought of as the current monthly pass price for Golden Gate Transit.

As in the case of BART, a zone-based monthly pass product involving Golden Gate Transit would need to adhere to the following constraints in order to avoid the risk of fare revenue loss from existing riders:

- The regional component of the zone-based monthly pass must be priced at or higher than 44 trips on Golden Gate Transit based on 20-trip ticket book pricing.
- If Golden Gate Transit's existing fare zones are consolidated for the integrated fare product, the regional component of the zone-based monthly pass must be priced based on Golden Gate Transit's furthest zone-to-zone distance. For example, a Sonoma (Zone A) – San Francisco (Zone C) monthly pass should use Golden Gate Transit fare zone 6 (Santa Rosa) to fare zone 1 (San Francisco) for pricing the regional component.

Figure 5-3 shows the existing Golden Gate Transit fare zone structure. A zone-based regional monthly pass would involve consolidating Golden Gate Transit fare zones 2, 3, and 4 into a Marin fare zone and Golden Gate Transit fare zones 5 and 6 into a Sonoma fare zone (although Golden Gate Transit indicated that its zone boundaries do not exactly follow county lines). The one exception is the Richmond-San Rafael bridge service, for which Richmond and El Cerrito would be considered part of the Western Contra Costa (Zone J) regional fare zone. Golden Gate Transit fare zone 1 corresponds to the San Francisco (Zone C) regional fare zone.

Figure 5-3: Existing Golden Gate Transit Fare Zones

Table 5-6 shows the pricing matrix for the integrated regional fare product's regional component (i.e., the floor pricing constraint) based on Golden Gate Transit's existing fare structure and the constraints stated above.

Table 5-6: Floor Pricing Constraints with Golden Gate Transit as Regional Operator

Zone A	Zone B	Maximum Golden Gate Cash Fare	Floor Pricing Constraint (44 trip multiple)
Marin	San Francisco	$4.24	$186.60
Marin	West Contra Costa	$2.88	$126.70
Marin	Sonoma	$4.92	$216.50
Sonoma	San Francisco	$6.72	$295.70
Sonoma	West Contra Costa	$5.28	$232.30
West Contra Costa	San Francisco	$5.28	$232.30

Pricing is rounded to $0.10 increments.
The maximum Golden Gate fare takes into account the 20% discount from the 20-ride ticket book.

Table 5-7 shows the local operators that connect with Golden Gate Transit, the estimated number of inter-operator transfers per weekday, and the current discount levels provided to riders who make inter-operator transfers.

Table 5-7: Feeder/Distributor Operators with Golden Gate Transit as Regional Operator

Local Operator	Zone	Estimated Weekday Transfers	Existing Discount: Cash Riders (per round trip)		Existing Discount: Pass Riders (per month)	
			Savings on Regional	Savings on Local	Savings on Regional	Savings on Local
AC Transit	West Contra Costa	180	$1.75	$1.75	none	None
SFMTA	San Francisco	1,500	None	None/$3.00[8]	none	$5 off SFMTA pass
Petaluma	Sonoma	30	$1.00	$1.00	Sonoma SuperPass (~$126)	
Santa Rosa	Sonoma	200	$0.10	$1.10	none	None
Sonoma	Multiple	200	$1.00	$1.15	none	None
Vallejo Transit	West Contra Costa	10	$1.75	$1.00	none	None
WestCAT	West Contra Costa	20	$1.75	$1.50	none	None

Source: Agency data or best estimates based on understanding of regional travel patterns. Estimated weekday transfer numbers in italics represent best estimates; other numbers are based on agency data. Does not include transfers between BART and other regional operators (Caltrain, Golden Gate Transit, Dumbarton Express, ferries). The number of riders who transfer between multiple regional operators is small enough that it is not necessary to reflect them in the pricing constraints.

[8] *Free transfers to or from SFMTA services (excluding cable cars) are provided to Golden Gate Ferry customers but not Golden Gate Transit bus customers.*

In direct contrast to Caltrain riders who make inter-operator transfers, Golden Gate Transit riders who make inter-operator transfers generally receive significant discounts when paying with cash but no discounts when using a monthly pass offered by a local operator (Golden Gate Transit does not offer a monthly pass). One exception to this is SFMTA, for which no cash discount is available for Golden Gate Transit bus riders but a $5 discount on the SFMTA monthly Fast Pass is available to Golden Gate Transit ticket book riders. Whether paying by cash or using a ticket book, Golden Gate Transit Ferry riders receive free transfers to SFMTA services, excluding cable cars. Another exception is the Sonoma SuperPass, which is priced at $126.00 and enables unlimited travel on Golden Gate Transit buses, but only within Sonoma County.

By combining the information from Tables 5-6 and 5-7, the ceiling pricing constraints for each of the zonal pairs which Golden Gate Transit serves as the regional operator can be determined as follows:

- In the San Francisco zone, the monthly price of SFMTA as a local operator is $40.00 (SFMTA FastPass price of $45.00 with a $5.00 discount).
- In Marin, there is no cost associated with local operators as Marin County Transit has a full fare transfer agreement with Golden Gate Transit. Sonoma County Transit also operates Route 38 in Marin County; for this route, a local fare credit agreement could apply.
- In Sonoma, the monthly price of the most expensive local operator is Sonoma County Transit's $55.00 unlimited ride 31-day pass.
- In West Contra Costa, there is no cost associated with local operators as AC Transit and WestCAT have full fare transfer agreements with Golden Gate Transit. The integrated fare product for this zone would not be valid on AC Transit Transbay services or the WestCAT Lynx service. The integrated fare for this zone would also not be valid on Vallejo Transit, which primarily serves Napa Solano (Zone L). Extending the pass functionality to include travel on BART within West Contra Costa (i.e., Richmond and El Cerrito stations in Zone J) would carry an additional price of $1.50 per trip x 44 trips = $66.00.
- In Central Alameda, the cost would be determined by the monthly cost of Golden Gate Transit to/from San Francisco and BART between San Francisco and Central Alameda ($171.60). Zones further south or east from San Francisco or Central Alameda would be priced at the Universal Pass price.

Table 5-8 shows the Effective Ceiling and Ceiling Pricing Constraints for each of the zonal pairs for which Golden Gate Transit serves as the regional operator, based on the previous discussion.

Table 5-8: Effective Ceiling and Ceiling Pricing Constraints with Golden Gate as Regional Operator

Zone 1	Zone 2	Floor Pricing Constraint	Additional Fare to Reach Effective Ceiling	Effective Ceiling Pricing Constraint	Additional Fare to Reach Ceiling	Ceiling Pricing Constraint
Marin	San Francisco	$186.60	$40.00	$226.60	$0.00	$226.60
Marin	West Contra Costa	$126.70	$0.00	$126.70	$0.00	$126.70
Marin	Sonoma	$216.50	$55.00	$271.50	$0.00	$271.50
Sonoma	San Francisco	$295.70	$55.00	$350.70	$40.00	$390.70
Sonoma	West Contra Costa	$232.30	$55.00	$287.30	$0.00	$287.30
West Contra Costa	San Francisco	$232.30	$40.00	$272.30	$0.00	$272.30
Marin	Central Alameda	$186.60	$160.90	$347.50	$66.00	$413.50
Sonoma	Central Alameda	$295.70	$160.90	$456.60	$66.00	$522.60

Travel between Marin and Sonoma counties and zones further south or east of San Francisco or Central Alameda would be priced at the Universal Pass price.

The effective ceiling pricing constraint for West Contra Costa – San Francisco with Golden Gate Transit as the regional operator ($272.30) is higher than the effective ceiling pricing constraint with BART as the regional operator ($255.20 from Table 5-5) for the same zonal pair. Therefore, the line item from Table 5-8 takes precedence.

5.1.4 Other Agencies as Regional Operator

Other Bay Area operators that provide signification inter-county regional service in specific market segments include AC Transit, SamTrans, SCVTA, and ferry operators. Table 5-9 shows the local operators that connect with these other regional operators, the estimated number of inter-operator transfers per weekday, and the discounts that are currently provided to riders who transfer between these operators.

Table 5-9: Feeder/Distributor Operators with Other Agencies as Regional Operator

Regional Operator	Local Operator	Estimated Weekday Transfers	Existing Discount: Cash Riders (per round trip)		Existing Discount: Pass Riders (per month)	
			Savings on Regional	Savings on Local	Savings on Regional	Savings on Local
AC Transit TransBay	SFMTA	4,000	none	none	none	$5 off SFMTA pass
AC Transit TransBay	WestCAT	*60*	none	$0.50	none	none
AC Transit Dumbarton	SamTrans	345	none	none	none	local fare credit (~$48)
AC Transit Dumbarton	Union City	80	none	$1.25	none	none
AC Transit Dumbarton	SCVTA	*50*	none	$1.75	none	local fare credit (~$61.25)
Alameda Ferries	AC Transit	*100*	none	$3.50	none	local fare credit (~$70)
Alameda Ferries	SFMTA	*100*	none	$3.00	none	local fare credit (~$45)
Golden Gate Ferry	SFMTA	500	none	$3.00	none	local fare credit (~$45)
SamTrans Express	SFMTA	4,500	none	none	none	$24 off SFMTA pass
SamTrans Express	SCVTA	*100*	none	$1.75	none	local fare credit (~$61.25)
SCVTA Express	AC Transit	*200*	none	none	none	local fare credit (~$70)
Vallejo Ferry	Benicia	*10*	none	$3.00	none	local fare credit (~$46)
Vallejo Ferry	SFMTA	550	none	none	none	$5 off SFMTA pass

Source: Agency data or best estimates based on understanding of regional travel patterns. Estimated weekday transfer numbers in italics represent best estimates; other numbers are based on agency data.

The table does not include the Blue and Gold Fleet services that operate between Marin and San Francisco and are primarily for tourists, not for regular monthly transit riders.

Each line item in Table 5-9 covers a zonal pair combination that can also be made using BART, Caltrain, or Golden Gate Transit as the regional operator. As such, these other regional operators would have pricing implications when the corresponding fare for a particular zonal pair, including existing inter-operator discounts, are higher than the pricing presented previously for BART, Caltrain, or Golden Gate Transit for the same zonal pair. This does not occur for any of the line items in Table 5-9. The discussion by zonal pair is as follows:

- San Francisco – Central Alameda – There is a $5.00 monthly fare discount for transfers between AC Transit and SFMTA. As such, the effective ceiling pricing constraint for this zonal pair based on these operators is $156.00 ($116.00 for the AC Transit TransBay pass and $40.00 for the SFMTA FastPass). This is significantly lower than the effective

ceiling pricing constraint for the same zonal pair with BART as the regional operator ($237.60 from Table 5-3). Pricing the integrated fare product for this market at $156.00 would result in fare revenue loss for BART.

- The same situation applies if the integrated fare product for this market was priced at $165.00, the cost of the Alameda Harbor Ferry monthly pass (which is good for local fare credit on SFMTA and AC Transit) – or at $184.00, or the cost of the Alameda/Oakland Ferry 40-trip ticket book and four additional one-way tickets (each ticket is also good for local fare credit on SFMTA and AC Transit).
- Peninsula – South Alameda – The AC Transit Transbay pass of $116.00 is accepted on the Dumbarton Express and as local fare credit on connecting SamTrans and SCVTA routes. Riders with a Dumbarton Express transfer pay $0.25 to ride Union City Transit. It is not feasible for a zone-based monthly fare product, valid on either BART or Caltrain, to be priced at this level.
- Marin – San Francisco – Golden Gate Ferry riders receive local fare credit on SFMTA, which eliminates the need for such riders to purchase a SFMTA FastPass. The higher priced of the two Golden Gate Ferry services for regular commuters is the Larkspur Ferry, with a discounted cost of $4.45 per trip using either a frequent rider ticket book or TransLink®. At 44 trips per month, the monthly cost to ride the ferry is $195.80, which is lower than the highest monthly cost to use Golden Gate Transit and SFMTA ($226.56 from Table 5-8). A cost of $195.80 would therefore undercut this arrangement.
- While the Blue and Gold Fleet services that operate between Marin and San Francisco are more expensive, they are clearly designed as tourist services and not for regularly monthly transit riders. Therefore, it is recommended that the Blue and Gold fleet not act as a pricing constraint for this zone and not be included in the integrated fare product.
- San Francisco – Peninsula – The cost of the SamTrans express monthly pass is $128.00, and entitles the rider to a $5 discount on the SFMTA FastPass (price of $40.00). Pricing the integrated fare product for this market at $168.00 would undercut the single-agency BART monthly cash fare between SFO and San Francisco of $220.70.
- San Francisco – Santa Clara County – SamTrans monthly passes are accepted as local fare credit on SCVTA when boarding in Palo Alto, which eliminates the need for those riders to purchase a SCVTA fare when headed southbound into Santa Clara County. A fare is required on SCVTA in the northbound direction if a SamTrans monthly pass holder does not board in Palo Alto, at an approximate cost of $38.50 per month ($1.75 per ride x 22 trips per month). Pricing

the integrated fare product for this market at $187.50 ($149.00 for the SamTrans express pass with an SFMTA FastPass and $38.50 in SCVTA fares) would undercut the $192.50 Caltrain and SFMTA price between San Francisco and Silicon Valley ($152.50 for the Caltrain pass, also valid for local fare credit on SamTrans and SCVTA, and $40.00 for the SFMTA FastPass), and would result in fare revenue loss for Caltrain.

- Santa Clara County – Central Alameda – The SCVTA express monthly pass is accepted as local fare credit on AC Transit. Pricing the integrated fare product for this market at $128.00 would undercut the single-agency BART cash fare per month between Fremont and the stations in Central Alameda.
- Napa/Solano – San Francisco – The Vallejo Ferry monthly pass, priced at $270.00, is accepted as local fare credit on the Benicia Breeze and entitles the rider to a $5 discount on the SFMTA FastPass (price of $40.00). Pricing the integrated fare product for this market at $310.00 would undercut the effective ceiling pricing constraint of $332.00 based on BART as the regional operator (44 trips between Walnut Creek and Balboa Park at $4.80 per trip – 6.25% "high value" discount = $198.00) and Fairfield Suisun Transit as the local operator ($134.00 zone 7 monthly pass between BART and Dixon).

Pricing for Concept 1A: Unlimited Regional Monthly Pass, Unlinked Trips. Based on the collective information from each market segment, the pricing constraints for the integrated fare product for each zonal pair are determined primarily by BART (Table 5-5) or Golden Gate Transit (Table 5-8) as the regional operator. Table 5-10 shows these monthly pass prices based on the effective ceiling constraints, rounded to the nearest dollar.

Table 5-10: Zone-Based Monthly Pass Prices

	Central Alameda	West Contra Costa	East Contra Costa	Napa/ Solano	Tri-Valley	South Alameda	Peninsula	Silicon Valley	San Jose	Marin	Sonoma
San Francisco	$227	$272	$283	$327	$269	$295	$263	$193 (c)	$332 (c)	$227	$351
Central Alameda	-	$186	$245	$265	$233	$235	$316	$400 (u)	$400 (u)	$348	$400 (u)
West Contra Costa		-	$256	$204	$254	$254	$330	$400 (u)	$400 (u)	$127	$287
East Contra Costa			-	$196	$290	$314	$372	$400 (u)	$400 (u)	$400 (u)	$400 (u)
Napa/Solano				-	$333	$333	$400 (u)	$400 (u)	$400 (u)	$400 (u)	$400 (u)
Tri-Valley					-	$235	$358	$288	$288	$400 (u)	$400 (u)
South Alameda						-	$400 (u)	$249	$249	$400 (u)	$400 (u)
Peninsula							-	$106 (c)	$245 (c)	$400 (u)	$400 (u)
Silicon Valley								-	$199	$400 (u)	$400 (u)
San Jose									-	$400 (u)	$400 (u)
Marin										-	$272

Zonal pairs to/from Marin and Sonoma counties are priced based on Golden Gate Transit as the regional operator. Other zonal pairs are priced based on BART as the regional operator, with the exception of San Francisco – West Contra Costa (based on Golden Gate Transit pricing).

The Santa Clara County passes to/from Tri-Valley and South Alameda are not valid for Caltrain travel within Santa Clara County.

(c): prices are valid only for Caltrain as a regional operator, not for BART as a regional operator. If BART were included, the prices would be significantly higher.

(u): values of $400 or more are reduced to $400 and designated as a "Universal Pass".

Using the San Francisco (Zone C)-based monthly passes as examples, the functionality of these products at the operator level would be defined as follows:

- 1) Central Alameda – San Francisco Pass: Priced at $227.00. Valid for travel on BART (stations in the Central Alameda and San Francisco zones), AC Transit (all services), SFMTA, and East Bay ferries between Alameda and San Francisco.
- 2) West Contra Costa – Marin - San Francisco Pass: $272.00. Valid for travel on BART (stations in the West Contra Costa and San Francisco zones), AC Transit, SFMTA, East Bay ferries, WestCAT (including Lynx), and Golden Gate Transit within Marin, Contra Costa, and San Francisco counties. Local fare credit on Vallejo Transit and Fairfield Suisun Transit.

- 3) East Contra Costa - San Francisco Pass: $283.00. Valid for travel on BART (stations in the East Contra Costa and San Francisco zones), AC Transit, SFMTA, East Bay ferries, County Connection, and Tri Delta Transit. Local fare credit on Benicia Breeze, Fairfield Suisun Transit, and Rio Vista Transit.
- 4) Napa – Solano – San Francisco Pass: $327.00. Valid for travel on BART (stations in the West Contra Costa, East Contra Costa, and San Francisco zones), AC Transit, SFMTA, East Bay ferries, WestCAT, Golden Gate Transit (within Marin, Contra Costa, and San Francisco counties), County Connection, Tri Delta Transit, Benicia Breeze, Fairfield Suisun Transit, Rio Vista Transit, Vallejo Transit, Vallejo Ferry, VINE, and Vacaville City Coach.
- 5) Tri Valley - San Francisco Pass: $269.00. Valid for travel on BART (stations in the Tri Valley and San Francisco zones), AC Transit, SFMTA, East Bay ferries, County Connection (from/to Tri-Valley BART stations only), Tri Delta Transit (from/to Tri-Valley BART stations only), and Wheels.
- 6) South Alameda - San Francisco Pass: $295.00. Valid for travel on BART (stations in the South Alameda and San Francisco zones), AC Transit, SFMTA, East Bay ferries, and Union City Transit. Local fare credit on SCVTA.
- 7) Peninsula - San Francisco Pass: $263.00. Valid for travel on BART (stations in the Peninsula and San Francisco zones), Caltrain (including and north of Redwood City), SamTrans (all services), and SFMTA.
- 8) Silicon Valley – San Francisco Pass: $193.00. Valid for travel on Caltrain (stations in the Silicon Valley and San Francisco zones), SFMTA, SamTrans, and SCVTA.
- 9) San Jose – San Francisco Pass: $332.00. Valid for travel on Caltrain (stations in the San Jose and San Francisco zones), SFMTA, SamTrans, and SCVTA.
- 10) Marin – San Francisco Pass: $227.00. Valid for travel on Golden Gate Transit (Marin and San Francisco counties), Golden Gate Ferry, Marin County Transit, SFMTA, and at BART stations within San Francisco.
- 11) Sonoma - San Francisco Pass: $351.00. Valid for travel on Golden Gate Transit (Sonoma and San Francisco counties), SFMTA, at BART stations within San Francisco, Cloverdale Transit, Healdsburg Transit, Petaluma Transit, Santa Rosa CityBus, and Sonoma County Transit.

Pricing: Calendar-Based Monthly Pass vs. 31-Day Rolling Pass. A 31-day rolling period pass would provide riders with more flexibility than a calendar-based monthly pass, with respect to planning around vacations and holidays. If fare levels are held constant, this may increase ridership if a higher number of new riders are attracted to the product. Fare revenue may increase if more new riders choose to use the product, or may decrease if existing riders are able to use the pass for trips that a calendar-based monthly pass would not have covered. A 31-day rolling period pass requires riders to keep track of the pass expiration date, although TransLink® can readily display this information to the rider.

Most transit operators in the Bay Area offer a calendar-based monthly pass. AC Transit offers a rolling 31-day pass, and Sonoma County Transit offers both a calendar-based monthly pass and a 31-day rolling period pass. BART and Golden Gate Transit are the primary operators that do not offer either pass product.

Pricing for Allowance of Intermediate Stops. By allowing stops on the regional operator within intermediate zones, ridership may increase if a higher number of new riders are attracted to the product or if existing riders are induced to make additional trips. Fare revenue may increase if more new riders use the product, or may decrease if existing riders save on trips in intermediate zones that they would have otherwise paid for.

Pricing for Concept 1B: Unlimited Regional Monthly Pass, Linked Trips. Limiting the user of the regional integrated fare product on feeder/distributor operators to trips that are linked to a trip on a regional operator will result in changes to implementation and product rules. Ridership may decrease if a lower number of new riders are attracted to the product, or if existing riders make fewer additional trips. Fare revenue may increase if existing riders pay for local trips that the pass would have otherwise covered, or may decrease if fewer new riders choose to use the product.

Pricing for Concept 1C: Limited Regional Monthly Pass. Capping the number of regional trips for which the integrated fare product may be used during the month requires riders to track the number of regional trips they make with the product, and could result in additional fare charges for riders towards the end of the product's validity period. A regional cap of 40 trips will have significantly greater impacts than a regional cap of 44 trips. However, even a regional cap of 44 trips may impact regular commuters. The month of August, which has no major holidays, can have as many as 23 standard workdays (i.e., 46 one-way trips). Any given 31-day period can also have as many as 23 workdays.

5.2 REGIONAL PASS PLUS PRICING CONSTRAINTS

Pricing for Concept 2A: Regional Pass Plus, Unlinked Trips. The Regional Pass Plus concept leverages the current BART Plus concept, introducing similar instruments for Caltrain (Caltrain Plus), Golden Gate Transit (Golden Gate Plus), and AC Transit Transbay services (AC Transit Plus). Relative to a zone-based monthly pass, the strengths and limitations of the Regional Pass Plus concept are as follows:

- Strengths: Regional Pass Plus would allow BART and Golden Gate Transit to retain their own pricing rules on their regional trips (station-to-station pricing on BART, trip-based pricing on Golden Gate). Regional Pass Plus would also result in less significant changes to existing fare policy business rules, limiting fare revenue risk for the regional operators and making revenue distribution easier.
- Limitations: Regional Pass Plus would be more limiting for some riders than a zone-based monthly pass, as riders would need to pay each time they ride on BART or Golden Gate Transit. Regional Pass Plus does not fit neatly into a single regional integrated fare product scheme; business rules would remain different for each regional operator. Regional Pass Plus also does not meet the needs of riders who would like the flexibility to choose different regional operators during a particular month (i.e., riders who trade-off between BART and AC Transit Transbay services for trips between the East Bay and San Francisco). From the rider perspective, the reduced fare revenue risks for the regional operators would result in higher fares for frequent riders.

The product pricing rules for each of the Regional Pass Plus regional operators would be as follows:

- Modified BART Plus: As currently structured, BART Plus is sold in eight different denominations for a half-month period (priced from $38.00 to $71.00), with the BART stored value ranging from $15.00 to $50.00 and the incremental amount ranging from $21.00 to $23.00. The BART stored value must be used within the half-month period. Riders do receive a "last ride bonus" for the last remaining value on the BART Plus ticket (even as low as 5 cents). BART Plus is accepted as local fare credit on the following local operators: Benicia Breeze, County Connection, Dumbarton Express, Rio Vista Transit, SamTrans, SCVTA, SFMTA, Tri Delta Transit, Union City Transit, WestCAT, and Wheels.

- Some rule changes to the existing BART Plus program would be possible with TransLink®. As examples, a modified BART Plus could be purchased for a full month period as opposed to (or in addition to) the half-month product. It would no longer be necessary for the BART stored value to expire within a given half-month or month. If a rider purchases a minimum of $60.00 of BART stored value at any one time (based on the minimum BART one-way fare of $1.50 x 40), that rider could have the option to purchase the local operators' monthly pass for that particular month. The local operator monthly pass would expire at the end of the pass period, but the BART stored value would not need to have an expiration date.
- Another possible change to the BART Plus program would be to include other connecting local operators that are not currently part of the program. These operators include AC Transit, Fairfield Suisun Transit, and Vallejo Transit. Of these operators, AC Transit has the most connections with BART and also the most expensive local monthly pass. AC Transit dropped out of the BART Plus program in September 2003, because the reimbursement rate was too low (currently $48.00 per month, compared to the current AC Transit local monthly pass price of $70.00) and remaining in BART Plus would have undercut AC Transit's own local monthly pass.
- To include AC Transit local services in the BART Plus program while keeping AC Transit financially whole, it would be necessary to increase the monthly pass increment to an amount closer to the price of the AC Transit local monthly pass. The re-priced BART Plus would then be valid on AC Transit local services, and would provide a local fare credit on Transbay services. However, re-pricing BART Plus to roughly $65-$70 is likely to induce riders who use other local operators to leave the BART Plus program, as their local monthly pass prices would be significantly less expensive. One possibility may be to retain BART Plus at current pricing for current participants, and introduce another BART Plus product at a higher price that includes AC Transit.
- Most Fairfield Suisun Transit and Vallejo Transit riders who connect with BART use services that are priced higher than those agencies' standard local fares. At current BART Plus price levels, it should be possible to extend local fare credit to these riders. The same is true for VINE in Napa County and Vacaville City Coach, which have a limited number of riders who connect to the BART system via other operators.
- Another option would be to introduce a "BART Express Plus" product that is valid on most express services offered by participating operators without the need to pay cash surcharges, including AC Transit TransBay services, WestCAT

Lynx, SamTrans express services, and SCVTA express services. The monthly pass increment associated with a BART Express Plus product would clearly need to be significantly higher, depending on exactly which set of express services are covered. Of current and proposed participating operators, Fairfield Suisun Transit has the most expensive express monthly pass instruments ($158.00 for a pass valid to/from Sacramento; $134.00 for a pass valid to/from Dixon in Solano County). A BART Express Plus product accepted as full fare on the local and express services of all participating operators (excluding Fairfield Suisun Transit services beyond Solano County) would likely need a monthly pass increment of about $120-$130 per month.

- Golden Gate Plus: A Golden Gate Plus product could be based on the purchase of a minimum of 40 Golden Gate Transit tickets (i.e., stored rides) at current prices, and could provide local fare credit on connecting local operators: AC Transit, SFMTA, Marin County Transit, Petaluma Transit, Santa Rosa Transit, Sonoma County Transit, Vallejo Transit, and WestCAT. Cloverdale Transit and Healdsburg Transit, which have a limited number of riders connecting to Golden Gate Transit via other operators, could be included as well.
- Among these local operators, AC Transit's $70 local monthly pass is the most expensive. However, Golden Gate Transit riders receive a $1.75 local fare credit on connecting AC Transit routes, and the number of riders who currently ride other AC Transit routes is likely to be small. Therefore, a Golden Gate Plus product could probably be priced at a monthly pass increment of about $55-$60 and not result in fare revenue loss for participating operators. To provide full fare credit on express and local services operated by connecting operators, the monthly pass increment would need to increase to about $120 to accommodate AC Transit Transbay and WestCAT Lynx services.
- Caltrain Plus: The existing Caltrain monthly pass would serve as the basis of the Caltrain Plus product, as it is already accepted as local fare credit on SamTrans and SCVTA. The validity of the pass could be expanded to include monthly pass privileges on SFMTA and/or for express services on SamTrans and SCVTA at a higher price ($40 to include SFMTA; $100 to include SamTrans and SCVTA express services).
- Alternatively, Caltrain Plus could be based on tickets instead of the monthly pass, as Caltrain currently offers both fare types. Using existing product pricing, a Caltrain Plus product based on tickets would provide lower net costs for occasional Caltrain riders (riders who use Caltrain 15 or fewer days in a month), but higher net costs for regular Caltrain riders (riders who use Caltrain for 16 or more days in a month).

- AC Transit Plus: The existing AC Transit Transbay monthly pass would serve as the regional pricing basis of the AC Transit Plus product, providing monthly pass privileges as local fare credit on connecting local operators: SFMTA, SamTrans, Union City, SCVTA, and WestCAT. Among these local operators, SCVTA has the most expensive local monthly pass, at $61.25. However, AC Transit riders with a Transbay pass receive a $1.75 local fare credit on connecting SCVTA routes. SFMTA is the only one of the five local operators that does not have a local fare credit agreement in place with AC Transit; the SFMTA local monthly pass is priced at $45.00.
- Alternatively, AC Transit Plus could be based on tickets as opposed to the monthly pass, as AC Transit currently offers both fare types. Using existing product pricing, an AC Transit Plus based on tickets would provide lower net costs for occasional AC Transit Transbay riders (riders who use AC Transit Transbay services for 16 or fewer days in a month), but higher net costs for regular AC Transit Transbay riders (riders who use AC Transit Transbay services for 17 or more days in a month).

Another option to consider would be to limit the monthly pass validity on local operators to only those trips linked to a trip on the regional operator. This could be implemented in two ways:

- Route Recognition: Pass validity could be recognized only on specific routes that connect with the regional operator. This would require bus operators to log in on their bus route(s) at the start of the day. Currently, Muni operators do not log in their routes and AC Transit operators often do not log in their routes. So while this approach could be implemented, it would require enforcing all operators to log in their routes. There is also a risk that riders would use the pass on those routes without actually connecting with the regional operator.
- Credit Back: Another approach would be to deduct the cash fare from e-cash on the local-to-regional trip, then refund it when the rider boards the regional operator within a specified timeframe (e.g., two hours after boarding the local operator). Riders that have passes on their TransLink® cards and do not have e-cash are allowed to "go negative" on e-cash with their TransLink® card on a single trip only. Their e-cash would go from negative back to $0 on boarding the regional operator. For the regional-to-local trip, no credit would need to be issued since the TransLink® card could recognize that the rider had previously used a regional operator.

For the Caltrain Plus and AC Transit Plus products, it is not likely that a product that enables only linked local trips could be priced appreciably lower than a product with full local monthly pass validity since the local pricing component is based on the $45.00 SFMTA monthly pass, which is priced at 30 times the SFMTA cash fare.

Table 5-11 summarizes the Regional Pass Plus concept and proposed pricing levels. The four products that are shaded (2, 5, 9, and 14) represent the primary products to be modeled; the remainder represent alternatives to the primary products.

Table 5-11: Regional Pass Plus Pricing

Product Type	Form of Payment for Regional Operator	Product ID	Validity for Local Operators	Price
BART Plus	**E-cash with 6.25% "high value" discount**	1	Local fare credit on Benicia Breeze, County Connection, Dumbarton Express, Fairfield Suisun Transit, Rio Vista Transit, SamTrans, SCVTA, SFMTA, Tri Delta Transit, Union City Transit, Vacaville City Coach, Vallejo Transit, VINE, WestCAT, and Wheels	Minimum $60 value added on BART, plus $45
		2	**Local fare credit for Product ID 1 operators and AC Transit**	**Minimum $60 value added on BART, plus $68**
		3	Full fare credit on express and local services for Product ID 2 operators (excluding Fairfield Suisun in Davis & Sacramento)	Minimum $60 value added on BART, plus $120
		4	Local fare credit for Product ID 2 operators, on trips linked to BART only	Minimum $60 value added on BART, plus $64
Golden Gate Plus	**Tickets based on existing zones and 20% discount**	**5**	**Local fare credit on AC Transit, Cloverdale Transit, Healdsburg Transit, Marin County Transit, Petaluma Transit, Santa Rosa Transit, SFMTA, Sonoma County Transit, Vallejo Transit, and WestCAT**	**Minimum 40 ticket purchase on Golden Gate Transit ($115.20 to $268.80), plus $60**
		6	Full fare credit on express and local services for Product ID 5 operators	Minimum 40 ticket purchase on Golden Gate Transit ($115.20 to $268.80), plus $120

Product Type	Form of Payment for Regional Operator	Product ID	Validity for Local Operators	Price
		7	Local fare credit for Product ID 5 operators, on trips linked to Golden Gate Transit only	Minimum 40 ticket purchase on Golden Gate Transit ($115.20 to $268.80), plus $45
Caltrain Plus (monthly pass based)	**2+ zone monthly pass based on existing zones and pricing**	8	Local fare credit on SamTrans and SCVTA	$106.00 to $291.50
		9	**Local fare credit on SamTrans, SCVTA, and SFMTA**	**$146.00 to $331.50**
		10	Full fare credit on express and local services for SamTrans, SCVTA, and SFMTA	$206.00 to $391.50
Caltrain Plus (ticket based)	2+ zone tickets based on existing zones and 15% discount	11	Local fare credit on SamTrans and SCVTA	Minimum 40 ticket purchase on Caltrain ($136.00 to $374.00)
		12	Local fare credit on SamTrans, SCVTA, and SFMTA	Minimum 40 ticket purchase on Caltrain ($136.00 to $374.00), plus $40
		13	Full fare credit on express and local services for SamTrans, SCVTA, and SFMTA	Minimum 40 ticket purchase on Caltrain ($136.00 to $374.00), plus $100
AC Transit Plus (monthly pass based)	**Transbay monthly pass**	**14**	**Local fare credit on SamTrans, SCVTA, SFMTA, Union City, and WestCAT**	**$160.00**
		15	Full fare credit on express and local services for Product ID 14 operators	$235.00
AC Transit Plus (ticket based)	Tickets based on existing pricing	16	Local fare credit on SamTrans, SCVTA, SFMTA, Union City, and WestCAT	Minimum 40 ticket purchase on AC Transit Transbay ($140.00), plus $45

Product Type	Form of Payment for Regional Operator	Product ID	Validity for Local Operators	Price
		17	Full fare credit on express and local services for Product ID 14 operators	Minimum 40 ticket purchase on AC Transit Transbay ($140.00), plus $120

Pricing for Concept 2B: Regional Pass Plus, Linked Trips. As with Concept 1B, requiring product use on feeder/distributor operators to be linked to a regional operator will result in changes to implementation and product rules. Ridership may decrease if a lower number of new riders are attracted to the product, or if existing riders make fewer additional trips. Fare revenue may increase if existing riders pay for local trips that the pass would have otherwise covered, or may decrease if fewer new riders choose to use the product.

Choice Riders. For this study, choice riders are those riders who have a choice of regional transit services for their daily commutes. Many factors may influence their choice (time, cost, amenities, comfort, weather, etc.), but these commuters are less likely to hold monthly passes or unlimited ride fare products from a particular agency.

One example is a commuter who lives in Berkeley and works in San Francisco. That commute may involve multiple modes of transit and may vary daily. One day, the commuter prefers to take the AC Transit Transbay F line to San Francisco, the next day BART from Downtown Berkeley to San Francisco. A product targeted for this particular rider is not intended to compete with AC Transit's monthly Transbay pass, which this particular commuter is not likely to purchase, but instead to offer the commuter a blend of both AC Transit Transbay and BART service for their commute.

Several commute segments have sizeable potential commute populations. These include El Cerrito – San Francisco (AC Transit G line, BART); Berkeley – San Francisco (AC Transit F line, BART); Oakland 19th St. – San Francisco (AC Transit NL line, BART); Oakland MacArthur/Telegraph (AC Transit C line, BART); Millbrae – San Francisco (SamTrans MX line, BART, Caltrain); Hillsdale to Redwood City – San Francisco (Samtrans KX PX & RX lines, Caltrain); and Palo Alto – San Francisco (Samtrans KX line, Caltrain). Since there are no data tracking riders who have these choices, we have estimated the market size for this particular product using different shares of current rider populations of certain lines. Assuming

20 percent to 50 percent of commuters have these choices, the market size for this product is between 450 and 1,124 riders per day among East Bay commuters and between 290 and 726 rider per day among Peninsula commuters.

For choice trip segments that do not include BART (Samtrans KX, PX, RX lines, Caltrain), a product that would cater to riders would depend on the origin/destination point. For those in the Silicon Valley zone (Samtrans KX in Palo Alto, Palo Alto Caltrain station), a potential choice rider pass could be a flat-fee 10-ride pass that is valid on both SamTrans and Caltrain. If it were priced at $49.00, neither SamTrans nor Caltrain would experience a loss of revenue.

For those whose trips involve Caltrain stations in Zone 2, a similar 10-ride pass priced at $37.50 (the price of a 10-ride Samtrans token book with $2.50 upgrade for each ride over 10 rides) would offer flexibility for the choice rider without a loss of revenue for either SamTrans or BART.

For trips involving BART, a modified BART Plus product has potential. In this case, depending on the origin or destination of the rider, either $35 (AC Transit) or $37.50 (SamTrans and Caltrain) is included for the cost of 10 Transbay or Express trips onto a TransLink® card, along with the value of 34 trips on BART between origin/destination city and San Francisco. The BART value would be discounted at 6.25 percent (the level of the current BART "high value" discount), and the rider would have the flexibility of occasionally riding AC Transit or SamTrans to/from work, or BART, without having to worry that the product value would expire and with the assurance of receiving the lowest possible fare (excluding monthly/31-day unlimited ride passes). Advantages to this alternative are the clear revenue splits between operators and, for riders who use one aspect of the product more frequently than the other, the ability to add onto the product to meet their transit needs.

For example, for the commuter described above, the choice rider product would consist of a 10-ride AC Transit Book combined with a BART ticket valued at $115.60 (34 rides at $3.40 each). The combined AC Transit/BART choice rider fare product would be priced at $143.40 ($35 for the AC Transit portion + $108.40 for the discounted BART value (approximately equal to $115.60 * .9375)).

Another option would be to create a flexible regional e-purse that provides a load discount relative to regular e-cash and can be used on multiple regional operators. A discount level of 6.25 percent from $48 (i.e., $45) would be equivalent to the "high value" discount provided by BART. AC Transit, Caltrain, and SamTrans would need to agree to provide this discount for the regional e-purse, which should not result in appreciable revenue loss. With a regional e-purse, revenue would be reconciled and distributed to the regional operators based on actual ridership using TransLink®. This differs from the other concepts, for which the regional operator would receive revenue at the time of product sale.

5.3 SINGLE RIDE DISCOUNT PRICING CONSTRAINTS

A single ride discount (i.e., a discount for a single trip crossing zone boundaries and possibly using more than one operator) is not consistent with the RM2 legislation that authorized this study and called for a zone-based monthly pass. However, a zone-based monthly pass is likely to be most appealing to riders who already use transit. A single ride discount may attract new riders who are not currently using transit due to the high prices. This strengthens the case for considering a single ride discount, which could apply anytime a rider uses a TransLink® card to make an inter-operator transfer.

As with a monthly pass instrument, a single ride discount is likely to result in fare revenue loss if a large number of existing riders benefit financially relative to existing inter-operator discounts. The two most common types of inter-operator transfers are BART-SFMTA (estimated 51,000 transfers per weekday) and BART-AC Transit (estimated 20,000 transfers per weekday). Both SFMTA and AC Transit provide a $0.50 round trip discount to cash riders. However, the next two most common types of inter-operator transfer types are Caltrain-SFMTA (15,000 transfers per weekday) and BART-SamTrans (6,200 transfers per weekday), for which no discount is provided to cash paying riders.

Table 5-12 groups inter-operator transfers involving regional operators into three categories: no discount for cash paying riders, a $0.50 round trip discount, and a greater than $0.50 round trip discount. The estimated number of weekday inter-operator transfers for each pair is shown in parentheses. Inter-operator transfers involving only local operators are not shown in the table.

Table 5-12: Estimated Inter-Operator Transfer Volumes Involving Regional Operators

No Cash Discount	$0.50 Round Trip Cash Discount	More Than $0.50 Round Trip Cash Discount
BART-Benicia Transit (48)	BART-AC Transit (20,000)	BART-County Connection: $0.90 (3,400)
BART-Fairfield Suisun Transit (99)	BART-SFMTA (51,000)	BART-SCVTA Express: $1.75 (200)
BART-Rio Vista (<10)	BART-Tri Delta (1,800)	BART-Union City: $1.00 (350)
BART-SamTrans (6,200)	BART-WestCAT (1,200)	BART-Wheels: $0.90 (2,065)
BART-Vallejo Transit (800)	AC Transit Transbay-WestCAT (50)	Golden Gate Transit-AC Transit: $3.50 (180)
Caltrain-BART (950)		Golden Gate Transit-Petaluma: $2.00 (30)
Caltrain-SamTrans (2,450)		Golden Gate Transit-Santa Rosa: $1.20 (200)
Caltrain-SCVTA (3,000)		Golden Gate Transit-Sonoma Co: $2.15 (200)
Caltrain-SFMTA (15,000)		Golden Gate Transit-Vallejo Transit: $3.50 (10)
Golden Gate Transit-BART (300)		Golden Gate Transit-WestCAT: $3.25 (20)
Golden Gate Transit-SFMTA (1,500)		AC Transit Dumbarton-Union City: $1.25 (80)
AC Transit Transbay-Caltrain (500)		Alameda Ferries-AC Transit: $3.50 (100)
AC Transit Transbay-SamTrans (345)		Alameda Ferries-SFMTA: $3.00 (150)
AC Transit Transbay-SCVTA (50)		Golden Gate Ferry-SFMTA: $3.00 (600)
AC Transit Transbay-SFMTA (4,000)		Vallejo Ferry-Benicia Transit: $3.00 (<10)
SamTrans Express-SCVTA (100)		AC Transit Dumbarton-SCVTA: $1.75 (?)
SamTrans Express-SFMTA (4,500)		SCVTA Express-SamTrans : $1.50 (100)
SCVTA Express-AC Transit (50)		
Vallejo Ferry-SFMTA (550)		

The estimated number of inter-operator transfers made per weekday is shown in parentheses. Data do not differentiate between the number of transfers made with cash versus those made with pass.

5.4 TRIP VALUE MONTHLY PASS PRICING CONSTRAINTS

The Trip Value (or denomination-based) Monthly Pass is based on Seattle's PugetPass model, which denominates the pass in $0.25 increments linked to the transit operators' underlying cash fares, and prices the pass at 36 times the cash fare denomination. The pass is valid for travel on all participating transit services, provided that the pass denomination is at least equal to the cash fare of the service the rider is using. If the cash fare is higher than the face value of the pass, the rider may pay the difference in cash. A primary characteristic of the Trip Value Monthly Pass is that pass prices are tied to cash fare values instead of geographic fare zones.

Relative to a Zone-Based Monthly Pass or a Regional Pass Plus, the strengths of the Trip Value Monthly Pass concept are as follows:

- Strengths: This pass is simple, making it easy to understand, explain and use. It does not require the creation of geographic zones across the region, which can be complicated to explain, understand and use, but uses the implicit zones that are already in place based on each operator's service area and fare structure, including BART's 43x43 fare matrix, and the geographic zones that Caltrain and Golden Gate Transit have defined. Customers also avoid paying extra because the pass is priced to the cash fare of the service used instead of the most expensive trip possible among different operators by zone pair.
- Limitations: Currently, there are numerous trip values in place among Bay Area transit agencies, although this limitation can be overcome as discussed below. Technically, this pass is also not consistent with RM2 legislation because it is not based on a regional zone structure. However, it preserves the current zone structures of regional operators.

Unlike the Zone-Based Monthly Pass or Regional Pass Plus, the Trip Value Monthly Pass also provides flexibility for future fare changes and different rider groups. For example, passes do not need to be re-priced if operators raise fares or introduce peak/off-peak surcharges or discounts. Customers would simply purchase a pass with the appropriate face-value pass. Passes with lower face values would easily be able to accommodate discounts for seniors, persons with disabilities and youth.

In setting pricing rules and constraints for a Bay Area Trip Value Monthly Pass (or denomination-based monthly pass) for, the main questions to be resolved are the following:

- Should each participant be required to price its cash fares at $0.25 increments?
- If $0.05 increments remain in place, should a pass be offered for every possible denomination?
- What is the pricing for the monthly pass products as a multiple of the corresponding trip value?

Pricing Cash Fares in $0.25 Increments. The two primary regional operators that do not currently price cash fares at $0.25 increments are BART and Golden Gate Transit:

- Many of BART's most common per-trip fares are not a multiple of $0.25. Select examples include Balboa Park – Powell ($1.55), Daly City – Montgomery ($2.80), Pleasant Hill – Embarcadero ($4.65), and West Oakland – Embarcadero ($2.65)
- Golden Gate Transit's current per-trip adult cash fare denominations are $2.00, $3.15, $3.60, $4.35, $5.30, $6.15, $6.60, $7.60, and $8.40. With the exception of the $2.00 cash fare within Marin County, none of the others are a multiple of $0.25.

Mandating that BART and Golden Gate Transit price their cash fares in $0.25 increments would have significant single-operator ridership and fare revenue implications. If these agencies round their cash fares up, ridership would decrease and fare revenue would likely increase. If these agencies round their cash fares down, ridership would increase and fare revenue would likely drop.

One of the key principles of the Integrated Fare Study is that transit agencies should not be required to change their individual, single-agency fare structures. Therefore, with the trip-value monthly pass approach, participating operators not be mandated to change their existing fare structure to price cash fares in $0.25 increments. BART and Golden Gate Transit are therefore assumed to maintain their existing fare structures and pricing.

Offering Passes in Every Possible Denomination. BART currently has 43 stations or 903 unique station-to-station pairs (i.e., ([43 x 43] – 43) / 2 = 903). To cover pricing for these 903 unique station-to-station pairs, BART uses a station-to-station pricing matrix with over 100 distinct adult cash fare denominations in $0.05 increments, ranging from $1.50 to $8.00. Furthermore, there are other transit operators in the Bay Area that, for select services, have adult cash fares that are over $8.00 (including Caltrain, Golden Gate Transit, Vallejo Baylink Ferry, Blue and Gold Fleet, and Fairfield-Suisun Transit).

If Bay Area transit operators make no changes to their existing fare structures, the number of individual denominations in available in the Bay Area would make introducing a monthly pass priced for each denomination confusing and impractical. A more reasonable approach would be to have a monthly pass only for cash fare denominations that have

the most ridership associated with them. This determination would need to be made for each operator, as discussed below.

Pass Pricing as a Multiple of Corresponding Cash Fares. For the integrated fare product to be revenue-neutral, the product pricing must not undercut any of the participating single-operator fare structures. If the integrated fare product were to provide a discount relative to a single operator's existing fare structure, riders who use only that operator would purchase the integrated fare product rather than the operator's existing fare product. While this would likely increase ridership, it would erode fare revenue for that operator. Table 5-13 shows relevant information pertaining to the single-operator fare structures of regional operators and select other premium priced services (cash fare and discounts for regular riders). This information is helpful in identifying the pricing constraints associated with the trip-value monthly pass.

Table 5-13: Pricing Constraints for Trip-Value Monthly Pass

Operator	Cash Fare(s)	Discounts for Regular Riders
BART	$1.50 to $8.00	6.25% "high value" discount
Caltrain	$2.25 to $11.00	26.5 monthly pass multiple
Golden Gate Transit	$3.15 to $8.40	20.0% ticket book discount
AC Transit Local	$1.75	40.0 monthly pass multiple
AC Transit Transbay	$3.50	33.1 monthly pass multiple
SamTrans Local	$1.50	32.0 monthly pass multiple
SamTrans Express	$4.00	32.0 monthly pass multiple
SCVTA Local	$1.75	35.0 monthly pass multiple
SCVTA Express	$3.50	35.0 monthly pass multiple
SFMTA	$1.50	30.0 monthly pass multiple
Alameda Harbor Ferry	$6.00	27.5 monthly pass multiple
Alameda Oakland Ferry	$6.00	33.3% ticket book discount
Fairfield-Suisun Transit	$1.50 to $10.50	15.0 to 33.3 monthly pass multiple
Golden Gate Ferry - Sausalito	$7.10	46.5% ticket book discount
Golden Gate Ferry - Larkspur	$7.10	37.3% ticket book discount
Napa Vine	$1.25 to $2.75	14.5 to 32.0 monthly pass multiple
Sonoma County Transit	$1.15 to $3.10	20.0 monthly pass multiple
Tri Delta – D/P, LLNL Express	$5.00	22.0 monthly pass multiple
Vallejo Baylink Ferry	$12.50	21.6 monthly pass multiple
Vallejo Bus to/from BART	$4.50	21.9 monthly pass multiple
WestCAT Lynx	$4.00	30.0 monthly pass multiple

Excludes fare information for non-premium priced local operator services, special event services, and the Blue and Gold Fleet. Local operator fares are not necessary to consider in defining pricing constraints for the trip-value monthly pass product. Special event services and the Blue and Gold Fleet are not necessary to consider because they are not services used for regular commute purposes.

The main findings from Table 5-13 are as follows:

- Among these operators, BART generally provides the lowest discounts on the regular cash fare for regular commuters (i.e., riders who make 40-44 trips per month). The BART discount of 6.25 percent applies to riders who purchase "high value" tickets for $45.00 or $60.00.
- Golden Gate Transit's current per-trip adult cash fare denominations are $2.00, $3.15, $3.60, $4.35, $5.30, $6.15, $6.60, $7.60, and $8.40. With the exception of the $2.00 cash fare within Marin County, none of the others are a multiple of $0.25.

Therefore, in pricing the revenue neutral Trip Value Monthly Pass, BART's fare structure will serve as the primary pricing constraint for cash fare denominations within BART's range (e.g., $1.50 to $8.00). For cash fare denominations higher than BART's maximum, deeper discounts could be provided.

BART does not currently offer a single-operator monthly pass and has determined that such a product would increase ridership but reduce fare revenue. The intent of the integrated fare is not to create a single-operator BART monthly pass and therefore, the integrated fare product should be priced above what a BART-only rider would pay per month. Therefore, a trip-value monthly pass within BART's cash fare range could be priced at a minimum multiple of 46.5 times the corresponding cash fare denomination, which is higher than the 40-44 trips (less a 6.25% "high value" discount) that a regular commuter would be expected to take during a typical month. This limits (but does not completely eliminate) the potential functionality of the product as a BART-only monthly pass.

BART's ridership data provided the following findings:

- About 96.0 percent of BART riders pay a one-way cash fare of $5.25 or less (excluding any applicable "high value" discount). The most common $5.25 fares paid are trips between Fremont and downtown San Francisco or between Dublin/Pleasanton and downtown San Francisco.
- About 98.8 percent of BART riders pay a one-way cash fare of $5.60 or less. The most common $5.60 fares paid are trips between Pittsburg/Bay Point and downtown San Francisco.
- About 99.5 percent of BART riders pay a one-way cash fare of $6.00 or less. The most common $6.00 fares paid are trips between Pittsburg/Bay Point and Daly City or between Pittsburg/Bay Point and Fremont.

As such, it is not essential for the 46.5 multiple to be applicable for the entire range of BART's cash fares (e.g., $1.50 to $8.00). If a monthly pass multiple less than 46.5 were established for cash fare denominations in the $6.00 to $8.00 range, only 0.5 percent of BART riders could potentially use the product as a BART-only monthly pass.

However, to be revenue neutral for cash fare denominations from $1.50 to $6.00, fare modeling indicates that Bay Area Trip Value Monthly Passes would need to be priced at 61 times the cash fare. This would further constrain the number of riders who could use the product as a BART-only monthly pass. Table 5-14 provides the proposed pricing for the Trip Value Monthly Pass. This proposed plan has 24 denominations, which were selected on the basis of BART ridership patterns and the fare structures of other operators. The denominations are not all in $0.25 increments, which is consistent with existing Bay Area operator fare structures.

Table 5-14: Proposed Pricing for Trip-Value Monthly Pass Product

Cash Fare Denomination	Pass Multiple	Monthly Pass Price	Validity on BART (% of ridership)	Validity on Other Operators
$1.50	61.0	$92.00	22.5%	SamTrans, SFMTA, many local operators
$1.55	61.0	$95.00	28.3%	As above
$1.75	61.0	$107.00	28.4%	As above + local AC Transit, local SCVTA, County Connection, Vallejo Transit, Wheels
$2.25	61.0	$137.00	31.6%	As above, plus Caltrain 1-zone
$2.65	61.0	$162.00	36.3%	As above
$2.90	61.0	$177.00	45.1%	As above, plus all Napa Vine
$3.10	61.0	$189.00	50.4%	As above, plus all Sonoma County Transit
$3.30	61.0	$201.00	55.9%	As above
$3.50	61.0	$214.00	62.5%	As above, plus all AC Transit and SCVTA
$3.60	61.0	$220.00	65.4%	As above, plus Golden Gate Transit z2-z1
$3.85	61.0	$235.00	73.9%	As above
$4.00	61.0	$244.00	76.4%	As above + Caltrain 2-zone & SamTrans Express
$4.35	61.0	$265.00	82.3%	As above, plus Golden Gate Transit z3-z1
$4.65	61.0	$284.00	87.5%	As above

$4.95	61.0	$302.00	90.7%	As above
$5.30	61.0	$323.00	96.1%	As above, plus Golden Gate Transit z4-z1
$5.75	61.0	$351.00	99.1%	As above, plus Caltrain 3-zone
$6.00	61.0	$366.00	99.5%	As above, plus Alameda Ferry services
$7.10	55.0	$391.00	99.8%	As above, plus Golden Gate Ferry
$7.60	55.0	$418.00	99.9%	As above + Caltrain 4-z & Golden Gate z5-z1
$8.40	53.0	$445.00	Systemwide	As above plus all Golden Gate Transit
$9.25	51.0	$472.00	Systemwide	As above plus Caltrain 5-zone
$11.00	45.0	$495.00	Systemwide	As above plus all Caltrain & Fairfield-Suisun
$12.50	41.0	$513.00	Systemwide	Systemwide validity (incl Vallejo Ferry)

6.0 Ridership and Revenue Impacts

The modeling process and results are discussed in this section, along with some specific market segments and existing inter-operator agreement and their implications for the implementation of a revenue neutral integrated regional fare product.

6.1 MODEL DESCRIPTION

The Booz Allen FARES model was used to estimate the operator-specific ridership and fare revenue impacts associated with the integrated fare product alternatives described in the previous section. The FARES model is a decision support tool designed to assist in conducting fare structure and fare pricing planning efforts, customized and calibrated to represent the Bay Area transit operators. The model develops future year ridership and fare revenue projections using base year ridership and fare revenue data by fare element, fare elasticity factors, and existing and proposed fare payment options. Each fare element within the model represents a particular market segment of riders that use the same operator(s), the same method of fare payment, and are in the same rider group (i.e., adult, senior/disabled, youth). Within the model, riders are allowed to shift to new fare payment options if those new options provide a financial savings relative to their existing fare payment method. Pricing is the only factor that drives the rider's decision in the FARES model and other factors, such as distance from the rider's front door to public transit or access to a particular operator, are not considered.

The primary parameters used for the model runs for the Integrated Fare Study were as follows:

- Number of Models: Four separate models were calibrated. A Regional Monthly Pass model was developed to evaluate zone-based monthly pass alternatives (262 fare elements). A Regional Pass Plus model was developed to evaluate that concept (166 fare elements). A third model was calibrated to evaluate the Single Ride Discount concept (18 fare elements). The fourth model was used to evaluate the Trip Value Monthly Pass (262 fare elements).

- Rider Groups: As noted elsewhere, commuters comprise the target market and the focus of this study. Since the integrated fare product will be priced for the full fare adult market, only adult riders, who are estimated to comprise about 92 percent of regular riders on both BART and Caltrain, were evaluated for these models. If discounted fare products are introduced specifically for senior/disabled and youth riders, the ridership and fare revenue impacts are likely to be about 4-8 percent greater than the results reported here.
- Ridership: Base year ridership was based on the estimated average number of weekday riders who make inter-operator transfers between particular operator pairs. These numbers were drawn from the Background Report (January 18, 2008) previously prepared by Booz Allen for the Integrated Fare Study, and data provided by each operator or estimated from the best available information. The weekday numbers were multiplied by 280 to convert to annual data; the 280 factor was estimated to be the ratio of weekday transit ridership to annual transit ridership in the Bay Area. The number of inter-operator transfers in the Bay Area involving a regional operator is estimated at about 67.4 million trips (or 33.7 million transfers).
- No specific data were available on the number of riders who use a feeder service, a regional service, and a distributor service to complete their trip. These numbers were assumed to be relatively small, at about 10 percent of the ridership associated with total inter-operator transfers (i.e., 90 percent of riders who make inter-operator transfers involving a regional operator use either a feeder service or a distributor service at one trip end, but not at both trip ends).
- Fare Payment: The fare payment options used by existing riders were drawn primarily from operator-specific data. For example, about 46 percent of AC Transit local riders pay with cash and 54 percent use a pre-paid product. For AC Transit Transbay riders, about 15 percent pay with cash and 85 percent use a pre-paid product. For Golden Gate Transit, about 46 of riders pay with cash and 54 percent use pre-paid tickets or TransLink®. For SamTrans, about 54 percent of adult riders pay with cash and 46 percent of adult riders use the monthly pass.
- Among current BART Plus participants, ridership data specific to BART Plus was available for the following participants: BART (about 0.6 percent of total ridership), County Connection (11 percent of ridership), Union City (16 percent of ridership), and WestCAT (9 percent of ridership). For other participants, BART Plus ridership rates were assumed – about 5 percent for larger operators (SFMTA and SamTrans) and about 10 percent for smaller operators.

- Average Fare per Trip: For local operators, the average fare paid per trip for cash riders was based on one cash fare per local boarding minus any applicable inter-operator transfer discount (e.g., $0.25 discount for AC Transit or SFMTA riders transferring to BART; local fare credit for SamTrans or SCVTA riders with a Caltrain 2+ zone monthly pass). The average fare paid per trip for pass riders was based on an average of 44 linked trips per monthly pass product, which excludes local trips not associated with transfers to/from a regional operator.
- For BART, Caltrain, and Golden Gate Transit, which have distance-based fares, the average fare paid per trip was calculated from station-to-station or route-level data. For adult riders on BART, the average fare paid systemwide is about $3.09 per trip, excluding use of the Muni FastPass on BART within San Francisco. The average fare paid ranges considerably based on geography ($1.93 for riders between West Contra Costa and Central Alameda; $6.51 for riders between Tri Valley and Peninsula). For adult riders on Caltrain, the average fare paid systemwide is about $4.96 for cash riders and about $2.99 for monthly pass riders – these also range considerably based on geography. For Golden Gate Transit, the average fare paid systemwide is about $2.55 per trip. However, for adult riders specifically going to/from San Francisco, and disregarding transfers internal to the Golden Gate Transit system, the average fare is estimated to be $4.52 per trip.
- Fare Revenue: The fare revenue derived from existing riders who make inter-operator transfers was determined by multiplying ridership by average fare paid per trip. The total annual fare revenue from riders who make inter-operator transfers is estimated at about $119.83 million, based primarily on 2006 data.
- Fare Elasticity: A fare elasticity of -0.27 was applied for the Regional Monthly Pass and Regional Pass Plus models. This elasticity is believed to be appropriate for regular commuters who are most likely to use these products. For the Single Ride Discount model, a fare elasticity of -0.35 was applied in order to represent occasional riders who are likely to be somewhat more sensitive to price. These elasticities were chosen based on elasticity studies and experience with riders' responses to transit fare changes.
- New Products: For BART, it is assumed that about 60 percent of riders would consider using a monthly pass if one was available, based on market research prepared for the Pass Program Background Report (September 2006). For riders on other services, existing monthly pass riders would be the most likely to consider using a new regional monthly pass product, but some existing cash riders may also shift to the product.

6.2 DISCUSSION OF SPECIFIC MARKET SEGMENTS

Because the FARES model was created to analyze ridership and revenue impacts of fare changes on transit riders who whose responses are measured in terms of traditional transit fare elasticities, adjustments were made to the modeling process to capture the ridership and fare revenue implications for specific market segments that are not usually considered to be impacted significantly by a fare change. These market segments include non-transit users, partial transit users, and frequent transit users as described in Section 3 (Guiding Principles). However, limited data are available in the literature on transit fare elasticities on how riders in each of these market segments would change their travel behavior if a new integrated fare product was introduced. The following paragraphs discuss the assumptions made regarding the additional ridership that could be derived from these market segments.

Non-Transit Users. Currently, approximately 20.1 million non-transit trips are made daily in the Bay Area (94.7 percent of all trips made). Of the non-transit trips, about 21.1 percent (approximately 4.2 million) are inter-zonal. The persons making the 4.2 million inter-zonal non-transit trips choose their travel modes for various reasons, including door-to-door travel time, ease of use, convenience, frequency, speed, cost, personal preference, or availability of transit service from origin to destination. A regional monthly fare product can help address some of these issues, but not all of them, and it is difficult to measure the reasons why commuters choose other modes of travel over transit on a daily basis.

With gas prices nearing a record high of $4.00 per gallon, Bay Area residents are re-evaluating their commute choices and trends show a growing preference for transit. In an April 18, 2008 article, the *San Francisco Chronicle* reported that BART ridership grew 6.7 percent from the previous year, and that there had been a 2 percent drop in the number of drivers crossing the region's seven state-owned toll bridges. Other evidence shows that when gasoline prices rise, transit ridership increases. According to a *San Francisco Chronicle* article on October 2, 2005, when gas prices reached an average $3.00 per gallon, transit use increased substantially in the Bay Area. BART ridership increased 3.5 percent from the previous year, while Caltrain ridership climbed 8.5 percent, and SamTrans and Santa Clara VTA posted ridership gains of 2.6 percent and 6.4 percent respectively.

If the price of gas continues to increase, it can easily be assumed that transit ridership will increase, and that the introduction of a regional product designed to make it easier and less costly to use transit will attract some current non-transit users. For every 1/100 of 1 percent (.0001) of non-transit regional commuters who switch to transit with the introduction of the regional fare product (specifically because they know of the product, not because it provides any discounts relative to existing prices), there will be an increase of approximately 424 daily inter-zonal linked trips on the region's transit systems. Marketing, single ride discounts, promotions, and/or service and service connectivity improvements are more likely to attract non-transit users to transit than a revenue-neutral integrated monthly pass product. This is primarily due to the price of the pass, which must be high in order to maintain revenue neutrality, and which will make the pass difficult for many people to afford.

However, there may be a limit as to how much transit ridership can increase under existing conditions. While many potential riders may want to use regional transit services, they may currently be choosing to drive because there is not sufficient capacity at transit stations to accommodate park-and-ride demand. These non-transit users might be attracted to transit if it was more financially advantageous to use feeder services to access stations, particularly if they currently perceive the cost of riding multiple transit systems to be more expensive than gas.

Partial Transit Users. Partial transit users are those riders who use transit for only part of their trips (e.g., rather than taking transit to a park-and-ride lot, they drive to the lot, park, and then board transit). As noted in Section 3.0, there are currently about 42,000 partial transit users on the BART system and about 4,100 partial transit users on the Caltrain system. Some of these riders could be encouraged to begin using a local operator to/from the BART or Caltrain systems, instead of driving and parking, with the introduction of an integrated fare product. Assuming there is a local service available that could work for such riders, the riders are likely to consider making a shift to transit if the service is either faster or less expensive than driving and parking. Typically, local transit services will not be faster than driving and parking because of the stops involved and waiting time, so the transit service must be less expensive than the cost of driving and parking for riders to consider using it. There may be an exception in the case of transit-only corridors (including rail transit systems, although they may not be considered local transit services), where transit may be faster than driving, especially on congested roadways.

Among BART parking lots, only two have daily parking rates of more than $1: West Oakland ($5) and Daly City ($2). Many BART riders who drive and park at BART choose to purchase reserved monthly passes in order to guarantee a parking space. The following BART parking lots have the highest monthly costs: West Oakland ($115.50); Lake Merritt, MacArthur, Rockridge, Lafayette, Orinda, Daly City ($84.00); Ashby, Fruitvale, North Berkeley, Pittsburg/Bay Point, Walnut Creek, Castro Valley, Fremont, San Leandro, Union City, Dublin/Pleasanton, El Cerrito Plaza ($63.00). Reducing the incremental monthly cost of AC Transit service from $70.00 to below $63.00 could be one way to get partial transit users to use AC Transit as a local operator. However, from a net systemwide perspective, it is unlikely that such a strategy will be revenue-neutral (AC Transit revenue would likely fall since the discount would apply to all current BART-AC Transit riders and not just partial transit users; BART parking revenue would drop).

For Caltrain, the primary local services that partial transit users could consider using (i.e., SamTrans and SCVTA) are already heavily discounted, since Caltrain monthly pass riders receive local fare credit on these services. While Caltrain's fare structure is well-integrated with SamTrans and SCVTA, Caltrain customers who transfer to SFMTA services receive only a $5 discount over the combined price of Caltrain and SFMTA monthly passes. Because the San Francisco Caltrain terminal is located more than a mile from San Francisco's Financial District and Central Business District, SFMTA is a critical link for Caltrain customers to reach their final destinations. According to Caltrain's latest ridership counts, 8,306 patrons board the system at the San Francisco station. Of all the zonal pairs involving regional travel from to and from San Francisco, travel data indicate that the Peninsula has the greatest potential to increase the transit mode share (see Table 3-1). Between San Francisco and the Peninsula, over 200,000 trips per weekday are not made by transit, but by automobile and carpools. Considering total travel demand in the Caltrain service area, it is likely that there is significant potential to increase Caltrain boardings/alightings at San Francisco station. While an integrated regional fare product could help transit's penetration of this market, the revenue-neutral constraint essentially precludes further integration of SFMTA and Caltrain fares, making it unlikely that the associated ridership benefits could be achieved.

Increasing both off-street and on-street parking fees and penalties may be a highly effective way to get partial transit users to use local transit service and increase net revenue. A more thorough analysis would be required to assess the merits of this approach. Service frequency increases and enhanced coordination are also important in order to increase ridership among this market. Introducing a new integrated fare product that does not provide discounts above and

beyond existing prices (without changes in service or parking prices) is unlikely to induce more than a couple hundred partial transit users to use local transit services instead.

Frequent Transit Users. Riders who typically use transit 3-4 days per week are likely to be driving, carpooling, biking, walking, or working at home on the other days, due to flexible work schedules, shortened work weeks, or plans that require access to a car. There remains some percentage of those riders who would use transit more often if an integrated fare product was available and priced appropriately. However, there is no real way to attract these riders without providing a deep discount to riders who already use transit 5 or more days per week, thus making this strategy not revenue-neutral. The revenue neutrality constraint would be violated because regular transit users represent the majority of both total regional ridership and fare revenue.

6.3 MODEL RESULTS

Table 6-1 shows the modeled ridership and fare revenue results from an overall regional perspective, per weekday for ridership and annually for fare revenue. A no-change baseline was assumed (i.e., it was assumed that model results would not be impacted by external factors such as population/employment growth, service changes, fuel prices or single operator fare changes).

Table 6-1: Regional Ridership and Fare Revenue Results

Scenario	Weekday Ridership		Annual Fare Revenue	
	#	%	$ million	%
Concept 1A: Unlimited Regional Monthly Pass, Unlinked Local Trips	450	0.19%	-$0.20	-0.15%
Concept 1A based on 31-day rolling period pass	460	0.19%	-$0.20	-0.15%
Concept 1A with intermediate stops allowed	470	0.19%	-$0.21	-0.16%
Concept 1B: Unlimited Regional Monthly Pass, Linked Local Trips	410	0.17%	-$0.19	-0.14%
Concept 1C: Limited Regional Monthly Pass, Unlinked Local Trips	440	0.18%	-$0.19	-0.14%
Concept 2A: Regional Pass Plus, Unlinked Local Trips	370	0.16%	-$0.23	-0.17%
Concept 2B: based on linked local trips	340	0.14%	-$0.19	-0.14%
Concept 3: Single Ride Discount (minimum $0.25 per transfer)	460	0.19%	-$0.34	-0.25%
Concept 4: Trip Value Monthly Pass	430	0.18%	-$0.16	-0.12%

Percentages are based on total estimated annual ridership and fare revenue associated with adult riders who make inter-operator transfers involving a regional operator (about 120,000 transfers or 240,000 trips per weekday; about $134.2 million in fare revenue annually).

Relative to the total ridership and fare revenue associated with riders who currently make inter-operator transfers, each of these alternatives results in small ridership gains and is essentially revenue neutral.

6.4 ELIMINATION OF EXISTING INTER-OPERATOR AGREEMENTS

As stated in Section 3.0 – Guiding Principles, the primary rationale for changing or eliminating existing inter-operator fare products (i.e., transfers or passes) is to simplify them and reduce inconsistencies in the discount provided among operators and geographies. Table 6-2 illustrates these inconsistencies for ten select operator pairs. The percentages reflect the discount that riders who make transfers between the two operators currently receive, relative to the price of purchasing two separate monthly passes for the two operators.

Table 6-2: Existing Fare Discount Percentages, Select Operator Pairs

Operator Pairs	Full Monthly Price, Operator 1	Full Monthly Price, Operator 2	Total Non-Discounted Monthly Price	Current Actual Monthly Price with Discounts	Amount of Monthly Discount	Percentage Monthly Discount
BART (downtown SF-12th St Oakland)-SFMTA	$127.60	$45.00	$172.60	$169.60	$3.00	2%
BART (downtown SF-12th St Oakland)-AC Transit	$127.60	$70.00	$197.60	$197.60	$0.00	0%
BART (downtown SF-Millbrae)-SamTrans	$176.00	$48.00	$224.00	$218.00	$6.00	3%
Caltrain (SF-San Jose)-SFMTA	$198.75	$45.00	$243.75	$238.75	$5.00	2%
Caltrain (SF-Peninsula)-SamTrans	$106.00	$48.00	$154.00	$106.00	$48.00	31%
Caltrain (SF-San Jose)-SCVTA	$198.75	$61.25	$260.00	$198.75	$61.25	24%
AC Transit Transbay-SFMTA	$116.00	$45.00	$161.00	$161.00	$0.00	0%
SamTrans Express-SFMTA	$128.00	$45.00	$173.00	$149.00	$24.00	14%
Golden Gate Transit (SF-San Rafael)-SFMTA	$153.12	$45.00	$198.12	$193.12	$5.00	3%
Golden Gate Ferry (SF-Larkspur)-SFMTA	$195.80	$45.00	$240.80	$195.80	$45.00	19%

Based on these examples, the percentage discount that riders receive each month relative to paying full fares on both operators ranges from 0 percent to 31 percent. From an overall regional perspective, one of the existing inter-operator fare agreements that is most inconsistent with the rest of the region is the acceptance of the Caltrain 2+ zone monthly pass as full local fare credit on SamTrans and SCVTA. This agreement, along with the SFMTA/BART agreement to accept the Fast Pass on BART within San Francisco, is one of the few examples of complete fare integration in the Bay Area. From a rider perspective, these arrangements are simple and provide a significant discount, although there are financial challenges for the operators involved.

From a practical standpoint, moving towards a regionally consistent fare discount while keeping each operator approximately revenue-neutral will require the creation of a regional fund that can be used to keep operators whole. The net effect of such a fund would be to transfer additional revenue obtained from markets in which fare discounts are reduced (e.g., Caltrain-SamTrans and Caltrain-SCVTA) to offset fare revenue losses incurred in markets in which fare

discounts are increased (e.g., BART-AC Transit and AC Transit-SFMTA). The nature of existing geographical discount inequities is such that this transfer is not merely a recalibration of a single operator's fare policies with other operators, but a true transfer of revenue from one operator to another. It is not clear that the benefits of a regionally consistent discount truly merit the significant fare policy changes that would be involved, the potential backlash from riders whose existing discount levels would be reduced, potential ridership losses, and the political and policy ramifications of these changes.

7.0 Revenue Distribution

The revenue distribution discussed in this section is based on the four primary model runs (Concept 1A: Unlimited Regional Monthly Pass, Unlinked Trips; Concept 2A: Regional Pass Plus, Unlinked Trips; Concept 3: Single Ride Discount; Concept 4: Trip Value Monthly Pass) using the alternatives defined at the beginning of Section 4.0 and the pricing identified in Section 5.0 (i.e., limited fare discounts). For purposes of this analysis, the revenue distribution from regional fare products among participating operators is based on the following assumptions:

- Pass Products: For pass products (i.e., the Regional Monthly Pass; the Trip Value Monthly Pass; the local pass component of the Regional Pass Plus), revenue is distributed in accordance with each operator's share of total ridership x the corresponding regular adult one-way cash fare for the trip. [Distribution based on adult average fare is likely to be a more equitable approach, but is also more data and analysis intensive].
- Regional Component of Regional Pass Plus: BART and Golden Gate Transit retain the full revenue from trips made on their systems. Caltrain retains the full revenue from sales of its Regional Pass Plus (this is the current policy for sales of Caltrain 2+ zone monthly passes). AC Transit Plus is based on the Caltrain approach. [Revenue from the local pass component of the Regional Pass Plus is distributed in accordance with "Pass Products" as stated above.]
- Single Ride Discount: Each operator assumes 50 percent of the $0.25 inter-operator transfer discount.

Table 7-1 shows the results of these revenue distribution assumptions for the Regional Monthly Pass.

Table 7-1: Regional Monthly Pass Results by Operator

Operator	Annual Results		Per Weekday Results	
	Ridership	Revenue	Ridership	Revenue
AC Transit	26,900	-$26,300	100	-$90
BART	47,300	-$152,500	170	-$540
Caltrain	1,100	$3,000	0	$10
Golden Gate Transit	500	-$1,700	0	-$10
SamTrans	2,100	-$100	10	$0
SCVTA	400	$700	0	$0
SFMTA	33,500	-$15,300	120	-$50
Other Operators	15,500	-$8,900	60	-$30
Total	**127,300**	**-$201,100**	**450**	**-$720**

With the Regional Monthly Pass, the ridership increase and fare revenue loss is distributed across most operators. BART is projected to have the highest ridership gains and the most revenue loss. If revenue were distributed based not on the full one-way fare but on an average adult fare, the revenue loss on BART would be reduced, because BART offers smaller percentage fare discounts on its existing fare products than most other operators.

Table 7-2 shows the results of the revenue distribution assumptions for the Regional Pass Plus.

Table 7-2: Regional Pass Plus Results by Operator

Operator	Annual Results		Per Weekday Results	
	Ridership	Revenue	Ridership	Revenue
AC Transit	41,500	-$230,500	150	-$820
BART	36,300	$106,700	130	$380
Caltrain	200	$500	0	$0
Golden Gate Transit	0	$0	0	$0
SamTrans	400	-$1,400	0	-$10
SCVTA	0	$800	0	$0
SFMTA	26,900	-$122,900	100	-$440
Other Operators	-700	$12,300	0	$40
Total	**104,500**	**-$234,700**	**370**	**-$840**

With the Regional Pass Plus, BART is projected to have both ridership and revenue gains because it retains all revenue for rides on its system. The same is observed for Caltrain and Golden Gate Transit, though the numbers are small. AC Transit and SFMTA have ridership increases but the most fare revenue loss. The revenue gain on BART would be reduced or eliminated if BART shares in the discount provision (as is the case with the current BART Plus product).

With this alternative, the ridership loss and revenue increase for other operators is largely attributed to a shift of County Connection and Wheels riders from the former BART Plus product to the standard monthly pass instruments. This occurs because the re-priced Regional Pass Plus now becomes more expensive than the regular local monthly pass products of those operators. This shift would not occur under a two-tiered Regional Pass Plus approach (one price for most local operators at $45 plus a premium price to include AC Transit at $68).

Table 7-3 shows the results of the revenue distribution assumptions for the Single Ride Discount.

Table 7-3: Single Ride Discount Results by Operator

Operator	Annual Results		Per Weekday Results	
	Ridership	Revenue	Ridership	Revenue
AC Transit	7,100	$15,800	30	$60
BART	27,200	$67,600	100	$240
Caltrain	19,800	$61,500	70	$220
Golden Gate Transit	5,200	$16,200	20	$60
SamTrans	33,500	$79,000	120	$280
SCVTA	3,000	$8,900	10	$30
SFMTA	30,200	$82,800	110	$300
Other Operators	1,700	$7,600	10	$30
Total	**127,700**	**$339,400**	**460**	**$1,210**

With the Single Ride Discount, the ridership increase and fare revenue loss is distributed in proportion to the volume of transfer activity for which the new $0.25 discount is provided.

Table 7-4 shows the results of the revenue distribution assumptions for the Trip Value Monthly Pass.

Table 7-4: Trip Value Monthly Pass Results by Operator

Operator	Annual Results		Per Weekday Results	
	Ridership	Revenue	Ridership	Revenue
AC Transit	38,800	-$39,900	140	-$140
BART	42,700	-$103,200	150	-$370
Caltrain	3,000	-$2,200	10	-$10
Golden Gate Transit	500	-$800	0	$0
SamTrans	1,200	$700	0	$0
SCVTA	1,200	-$1,900	0	-$10
SFMTA	24,600	-$8,900	90	-$30
Other Operators	7,800	-$2,300	30	-$10
Total	**120,000**	**-$158,100**	**430**	**-$560**

Trip Value Monthly Pass distribution results are fairly similar to the Zone-Based Monthly Pass.

With the data available from a smart card like TransLink®, revenue could also be shared as it will be in the Seattle area, by treating each pass as a revenue pool and allocating the revenue to the operators that were used by the passholder, weighting each boarding by the fare associated with it. Transit agencies in the Seattle region developed this formula with the objective of ensuring fair revenue distribution and preventing cross subsidies.

8.0 Integrated Fare Program Findings and Recommendations

The findings of the Integrated Regional Fare Study indicate that there is a potential market among non-transit users and partial transit users (i.e., those who use transit for part of their commute trip and drive for part of it) for an integrated regional fare product that will attract additional trips to transit. However, concerns about the revenue implications for Bay Area transit agencies of offering such a product at a discount from current transit fares will constrain the region's ability to achieve the objectives of the RM2 legislation by attracting significant transit ridership using an integrated fare product.

The most recent U. S. Census (2000) identified 3.3 million daily commute trips in the nine-county region. Transit was estimated to account for approximately 9.7 percent of those trips, when 316,000 individuals used transit for their daily commutes. The premise of RM2 and this study is that an integrated regional fare program could encourage greater use of the Bay Area's transit network by making it easier and less costly for commuters to use transit, thereby easing congestion and reducing emissions.

Based on total travel volumes and current mode shares among the twelve geographic fare zones identified for the study, 12 zone pairs were identified that have high travel demand (50,000 or more trips per weekday) and low transit mode shares (less than 6 percent). These "non-transit users" include trips between:

- Two zone pairs that experience 200,000 or more trips per weekday that are not made by transit. These include trips between the Peninsula and Silicon Valley zones and the Silicon Valley and San Jose zones.
- Ten zone pairs have between 50,000 and 200,000 non-transit trips per weekday. These include:
  - Western Contra Costa and Eastern Contra Costa
  - Eastern Contra Costa and Napa/Solano, Tri Valley, and South Alameda
  - Tri Valley and South Alameda
  - South Alameda and Peninsula, Silicon Valley and San Jose

- Peninsula and San Jose
- Marin and Sonoma.

In addition, the study identified commuters who use transit for part of the trip and drive for part of it (e.g., drive to/from a park-and-ride lot). The two largest potential markets are 46,100 daily "partial transit users" who drive to rail stations and commute on BART (42,000) and Caltrain (4,100).

Finally, "frequent transit users" who do not use transit to commute every weekday were also identified. Some commuters who currently telecommute or work four days per week may not benefit from an integrated fare product. On the other hand, commuters who currently take transit on some days and drive on other days may be enticed by a monthly pass that pushes them to reach a threshold number of trips to achieve financial savings.

Four primary approaches to providing an integrated regional fare product were defined and evaluated:

- Concept 1: Regional Monthly Pass – a monthly pass valid between specific zones (residence zone and work zone), including travel on local feeder services in the origin zone, the regional operator, and local distributor services in the destination zone. Variations on this concept would reduce the revenue risk by capping the number of trips allowed on the regional service or by limiting local trips to those linked to a trip on a regional provider.
- Concept 2: Regional Pass Plus – building on the BART Plus concept, the regional operator portion of this alternative could be a stored value ticket, stored trip ticket, or pass-based product. It would also provide a pass valid for local travel in specific origin and destination zones. A variation on this concept would further reduce revenue risk by limiting local trips to those linked to a trip on a regional provider, although this is more complex from a customer's perspective.
- Concept 3: Single Ride Discount – a fare valid for a single trip between two specific zones, including travel on local feeder service(s) in the origin zone, a regional operator, and local distributor service(s) in the destination zone.
- Concept 4: Trip Value Monthly Pass – a monthly pass valid for transit trips up to and including a specified cash fare, or trip value.

Ridership and fare revenue results were similar for each concept. Although transit users are price sensitive, the requirement to maintain revenue neutrality for the transit agencies means that prices of regional integrated fare products must be set at levels that offer minimal savings for riders over existing fares. As a result, ridership levels are unlikely to increase substantially. Regionwide, ridership projections show increases on the order of 300 to 500 boardings per weekday (less than 0.2% of current boardings) and very small negative impacts on annual regional fare revenues ($160,000 to $340,000, reductions of 0.25% or less). Consequently, if revenue neutrality is an unavoidable constraint, it is the recommendation of this study that no further steps be taken to develop a regional integrated fare product.

Nevertheless, the Integrated Fare Study did develop and evaluate several regional fare products that could be viable if revenue neutral pricing were not a constraint. In particular, the Trip Value Monthly Pass is attractive for reasons such as the following:

- It is simple, making it easy to understand, explain and use. In fact, the concept has been implemented successfully in the Seattle area.
- It does not require transit operators to make any changes to their fare structures. For operators that do not currently offer a monthly pass, the pricing strategy could address concerns about introducing a pass-based product.
- It does not require the creation of geographic zones across the region, which can be complicated to explain, understand and use, but uses the implicit zones that are already in place based on each operator's service area and fare structure, including BART's 43x43 station fare matrix, and the geographic zones that Caltrain and Golden Gate Transit have defined. Customers avoid paying extra because the pass is priced to the cash fare of the service used instead of the most expensive trip possible among different operators by zone pair.
- It avoids some zone-based pricing in the Monthly and Regional Pass Plus alternatives that is counterintuitive (e.g., a monthly pass from San Francisco to Peninsula is more expensive than a monthly pass from San Francisco to Silicon Valley because taking BART to SFO is more expensive than taking Caltrain to Redwood City).
- It provides a monthly pass, consistent with RM2 requirements.
- It is flexible and will accommodate changes in operator fare structures (e.g., introduction of peak/off-peak fares, or services that are priced at a premium or a discount).

- Its flexibility will also readily accommodate changes in cash fares. Unless a specific face value did not already exist, users would simply purchase a pass with the appropriate face value.
- Its flexibility would also easily accommodate additional rider groups and their associated price structures, such as seniors, persons with disabilities and youth.
- It could be implemented prior to a full TransLink® rollout, although the effectiveness of the program would increase as more of the regional operators and the larger feeder/distributor operators participated.

However, given the revenue neutrality constraint, further development of the Trip Value Monthly Pass approach cannot be pursued at this time because it would require pricing the fare at a level that would not result in meaningful ridership gains.

In conclusion, although Bay Area transit agencies are experiencing increased ridership as a result of gas prices, the creation of a *revenue neutral* integrated fare in and of itself is not likely to increase ridership. In fact, because the cost of a regional pass will be high in order to maintain revenue neutrality, it is likely that investments in marketing, promotions, connectivity, and service enhancements will attract additional transit riders more effectively than a revenue neutral, integrated regional monthly pass.

In evaluating alternative pricing structures to determine those that would be revenue neutral, a broad range of prices was evaluated, including some that yielded non-revenue neutral results. If revenue neutrality were not a constraint (e.g., if transit agencies were able to accommodate a limited impact on fare revenue or if a funding source could be identified to subsidize the cost of implementation), alternatives such as the Trip Value Monthly Pass may merit further consideration. Transit agencies in other regions have implemented non-revenue neutral approaches to regional fare integration and similar alternatives could be evaluated for the Bay Area.

Appendix A: Peer Regional Fare Programs

As in the Bay Area, many U.S. metropolitan are served by multiple transit providers and multiple modes of transit. Completing a transit trip may require a passenger to transfer among one or more operators and among a variety of transit services, possibly including local and express bus, light rail, rapid transit, commuter rail, and in some cases, ferries and people movers. The multiple service providers require riders to be knowledgeable about different operators' routes, transfer points, and fares and fare payment systems.

In some regions, transit systems are using fare policy and technology options to enable fare integration, in order to facilitate the use of transit and to achieve other agency or regional goals and objectives. This appendix provides information on fare integration in the Chicago, Los Angeles, New York, San Diego, Seattle, Los Angeles and Washington DC metropolitan regions. These regions have been selected primarily because each is served by multiple transit agencies. The approaches to and extent of fare integration vary significantly among them, from full integration of fare policies in San Diego to limited integration on select fare products among specific operators in the Washington DC area.

The information provided in Table A-1 highlights the regional fare products that are currently in place, including pricing, media, and basis for revenue sharing. In Los Angeles and Seattle, the potential for loss of fare revenue was a key consideration in negotiating the agreements. In both cases, participating operators have been kept whole by providing reimbursement on the basis of each operator's average fare. These two programs are discussed in further detail at the end of this appendix.

Table A-1: Peer Integrated Fare Products

Metropolitan Region	Integrated Fare Product	Price	Medium	Revenue Sharing	Notes
Chicago – joint pass agreements; regional smart card (limited to CTA and Pace)	**Pace/CTA 30-Day Pass:** accepted on CTA and Pace **Link-Up:** Pace/CTA monthly pass sticker on Metra monthly pass **PlusBus:** Pace monthly pass sticker on Metra monthly pass **Chicago Card** and **Chicago Card Plus:** smart cards accepted on CTA and AFC-equipped Pace buses	**30-Day Pass:** $75 **Link-Up:** Metra pass + $36 **PlusBus:** Metra pass + $30 **Chicago Cards** provide $0.25 discount on cash fares	Passes: magnetic stripe/flash pass **Chicago Cards:** smart cards	**30-Day Pass:** Each agency keeps the proceeds of pass sales + CTA reimburses Pace ~$500,000 per year for fare revenues lost on trips originating on Pace. **Link-Up:** CTA receives $29.40, Pace receives $12.60 (Metra subsidizes $6) **PlusBus:** Pace receives $38.54 (Metra subsidizes $8.54)	Metra system has been a barrier to integrating commuter rail fares Inter-operator transfers eliminated
Los Angeles – regional monthly pass	**EZ Transit Pass:** Monthly pass valid on 24 Los Angeles County transit providers	**Local:** $70 **Express:** $18/zone (up to 10 zones) **Senior/Disabled:** $35 ($9.50 per express zone)	Magnetic stripe/flash pass	Operators calculate average fares annually using prior year data and track EZ Pass boardings by rider category and service type. Operators are claim and are reimbursed at average fare per boarding	EZ Day Pass under consideration Plan to migrate to TAP (regional smart card)

Table A-1: Peer Integrated Fare Products (continued)

Metropolitan Region	Integrated Fare Product	Price	Medium	Revenue Sharing	Notes
New York – regional fare card	**MetroCard:** magnetic fare card accepted on NYCT local and express buses and subways, Long Island Bus, Staten Island Rwy, NYC private local and express bus lines, PATH, JFK AirTrain **Joint Monthly/MetroCard Commutation Fares:** discounted LIRR/MNR monthly pass + 30-day unlimited ride MetroCard	**Pay-per-Ride MetroCard:** 20% bonus of loads of $10 or more **30-Day Unlimited Ride MetroCard:** $76 **Joint Commutation Fares:** $5 discount on LIRR/MNR monthly pass + $76 for 30-day unlimited ride MetroCard	MetroCard: magnetic fare card Joint Commutation Fares: flash pass + MetroCard	Average fare calculated for each fare product and revenues are distributed at the rate of an average fare per boarding by fare type	
San Diego – integrated regional fares	Fares were fully integrated and service was operated under the MTS umbrella for many years before transit operations were consolidated under a single agency in 2004.	MTS has a service-based, integrated fare structure (6 types of bus routes, light rail, commuter rail).	Cash, magnetic transfers, paper transfers and tickets, flash passes	Pass revenues allocated in proportion to boardings using those fares	Migrating to Compass (regional smart card)

Table A-1: Peer Integrated Fare Products (continued)

Metropolitan Region	Integrated Fare Product	Price	Medium	Revenue Sharing	Notes
Seattle – regional monthly pass	**PugetPass**: Monthly, 3- and 12-month pass valid on 5 transit providers in 3 counties, for local and express buses and commuter rail. One-day, one-week and two-week PugetPasses available at commuter rail TVMs	PugetPass is denominated to equivalent cash fares in $0.25 increments. Monthly Puget Pass prices range between: $0.50 trip value: $18 $4.75 trip value: $171	Magnetic stripe / flash pass	On-board surveys used to calculate inter- and intra-system transfer rates, and average fare per boarding (AFB) by mode, agency, route, PugetPass denomination. All fares, including cash, are distributed on using the applicable AFB. Local/ Sound Transit transfers reimbursed at 2/3 AFB; local/local transfers reimbursed at full AFB	Removing cash fares from the revenue distribution process Operators have been "kept whole" through Sound Transit's Fare Integration Fund Migrating to Orca (regional smart card)
Washington DC – interagency transfers and passes	**Transfers:** bus-to-bus and Metrorail-to-bus for WMATA and 9 local transit providers in Northern Virginia and Maryland **Metrobus Passes:** accepted by local transit providers **Transit Link Cards (TLC):** monthly pass accepted on MARC or VRE (commuter rail) as well as local buses, Baltimore bus and rail transit, and Metrorail	**Bus-to-bus transfer:** free bus connection **Rail-to-bus transfer:** $0.90 discount on bus fare Weekly Metrobus Pass: $11 **MARC TLC:** $80 + monthly pass price **VRE TLC**: $80 + VRE monthly pass price	Paper and smart card transfers (smart card readers not fully installed on local services); magnetic stripe / flash pass for TLC	No revenue sharing on transfers or passes TLC: $80 to WMATA, remaining value to MARC or VRE	Migrating to common smart card technology for Baltimore/ Washington region Migrating to SmarTrip (regional smart card) for bus-to-bus and rail-to-bus transfers Regional one-day pass eliminated in Jan-2008

A-1. PUGET PASS (SEATTLE)

The 1996 referendum that created the Central Puget Sound Regional Transit Authority (Sound Transit, the regional provider of express bus and commuter and light rail services) mandated a "uniform, single-ticket fare system" among local and regional transit providers, and required Sound Transit to work with the transit providers in the region to develop an "integrated fare policy for the entire public transit service network."

The process began at the staff level with a working group that included Sound Transit and the four local transit agencies that provide service within the Sound Transit district boundaries (King County Metro, Community Transit, Everett Transit and Pierce Transit), which defined the issues facing implementation of a regional pass. They also convened meetings with local elected officials on their Boards to get agreement on acceptable provisions for a regional pass. The risk of revenue loss was a key point, and was resolved when Sound Transit agreed to provide funding for a Fare Integration Fund that is used to keep operators whole with respect to fare revenue.

PugetPass was introduced in 1999 with the objectives of providing a regionally-coordinated fare structure, enabling a one-ticket ride, and making it easier to move toward implementation of a regional smart card. The monthly PugetPass functions both as a flash pass and as a magnetically-encoded pass, enabling riders to use a single fare card on multiple transit systems. The five "founding" agencies are full participants in the program. Intercity Transit (Olympia), Washington State Ferries and Kitsap Transit also participate, but do not share revenues on the same basis as the full participants. The participating agencies currently provide (and the pass is accepted on) local and express bus services and commuter rail service. Central Link (Seattle's light rail) will begin service in 2009; fares are currently free on Tacoma Link (light rail).

Pricing Considerations

Another key aspect of the PugetPass strategy was the development of a coordinated fare structure throughout the region. While each agency establishes its own fares, the PugetPass program has resulted in denominating operators' fare structures in $0.25 increments. This shift, which each operator achieved through its own fare change process, has been

implemented over time. In some cases, the agencies chose to retain their own monthly passes, but for the most part, they were eliminated once each agency completed the transition to a $0.25-based fare structure.

The fare structure modification has simplified fares from a regional perspective and has made it possible to define a regional PugetPass based $0.25 denominations. PugetPass is currently available for cash fare values from $0.50 to $4.75, as shown in Table A-2, to accommodate the full range of cash and discount fares among the region's transit providers. The 36-trip multiple that is used to price the various PugetPass denominations was chosen because it was close to the standard among the agencies developing the Puget Pass.

Table A-2: PugetPass Pricing

PugetPass Denomination	Monthly Pass Price	PugetPass Break Even
$0.50	$18	36
$0.75	$27	36
$1.00	$36	36
$1.25	$45	36
$1.50	$54	36
$1.75	$63	36
$2.00	$72	36
$2.25	$81	36
$2.50	$90	36
$2.75	$99	36
$3.00	$108	36
$3.25	$117	36
$3.50	$126	36
$3.75	$135	36
$4.00	$144	36
$4.25	$153	36
$4.50	$162	36
$4.75	$171	36

This approach to pricing makes it easy to determine whether a pass is valid for a particular fare. For example, a two-zone Sound Transit adult fare costs $2.50. The corresponding PugetPass is priced at $90. That pass may be used on any of the

other participating agencies for services with cash fares that do not exceed $2.50. More expensive services require either a higher denomination PugetPass or a cash upgrade to make up the difference in cash fares.

Revenue Sharing

PugetPasses are sold by the operating agencies through their sales outlets and the sales proceeds are held in locally managed accounts at each agency. Sound Transit is responsible for reconciling proceeds among the participants, with revenues shared among the five full participants on the basis of each operator's average fare per boarding and forecasts of boardings and transfers. Average fares are updated at the beginning of each year, using a comprehensive on-board survey of transit riders throughout the Puget Sound region. The purpose of the survey is to calculate average fare per boarding for each operator and to project inter-agency transfer boardings.

This method was designed to keep each operator financially whole with respect to fare revenues. The Regional Pass and Fare Program Reconciliation Agreement guarantees that each participating operator will be reimbursed for enabling customers to make intersystem transfers. For intersystem transfers, the Agreement provides that participating operators earn fare revenue for riders using their services, providing reimbursement on the basis of each agency's average fare per boarding:

- **Local–Sound Transit Boardings:** each agency receives 2/3 of its average fare per boarding for local-Sound Transit boardings
- **Local–Local Boardings: e**ach agency receives the full amount of its average fare per boarding for local-local boardings.

The Fare Integration Fund is being phased out. From 2002 through 2005, a total of $14.0 million was paid from the fund to cover shortfalls under the program. Any unallocated PugetPass revenues were allocated back to the operators, independent of the use of the Fare Integration Fund to keep operators whole. Currently, Sound Transit is directly reimbursing the transit agencies for the 1/6 average fare per boarding that is the difference between the ½ of a full fare

that a transit agency might expect per round trip and the 2/3 average fare per boarding that the operators were guaranteed under the Regional Pass and Fare Program Reconciliation Agreement.

Over the next year, when the PugetPass is expected to migrate to Orca, the regional smart card, the revenue sharing formula will change and actual usage data will be used instead of survey data to allocate revenue. Each PugetPass will be treated as a revenue pool and boardings made using a pass will be tracked and the corresponding revenue pool will be shared proportionately among the agencies used by the passholder, based on the value of each of the linked trips made with that pass. Similar, trips made using the TransLink® regional e-purse will also be pooled and tracked and distributed back to the operators.

The revenue sharing formula was explicitly developed to ensure fair revenue distribution and prevent cross subsidies. Each linked trip (defined as multiple boardings on any/all agencies within a two-hour time period) is assigned a value equal to the fare of the highest segment. The total of these values (which may be more or less that the pass sales value) is established as the 100% pool, with each linked trip value given a percentage weight in proportion to its relative value. Each agency in a linked trip is assigned a weight within the linked trip, in proportion to the highest value segment for that agency. Any lower value boardings on that agency within the linked trip do not receive a weight, to account for an assumption of free intra-system transfers. Each PugetPass boarding accrues to that agency, according to the following formula: ($ pass value) * (linked trip weight %) * (boarding weight within linked trip %).

Ridership Impacts

Although the program was evaluated after two years, there are limited data available on ridership impacts of the PugetPass program. At that time, there had been a 2.5% increase in pass sales regionally, but there was no indication as to whether they were being sold to new or existing riders. It was also estimated that inter-agency transfer trips tripled, from less than one percent of regional trips to about 2.5 percent of regional trips. From 2004 to 2007, it is estimated that the number of passes in circulation each month increased 49%, from 49,000 to 73,000, and PugetPass ridership increased 63% from 22 million to approximately 36 million unlinked boardings. At those levels, usage rates currently average 41.6 unlinked boardings per pass,

Program Administration

Program administration costs include one fulltime equivalent accountant, the survey (which has been conducted twice since the program was initiated), and the cost of the passes (which at $0.40 per card is estimated to be lower than the cost for individual agencies to provide their own passes). Marketing is handled at the regional level, to provide a "common face" to the program.

Lessons Learned

Sound Transit staff indicated that in addition to the need for the Fare Integration Fund, some of the challenges the program has faced included getting everyone to agree on the design of the pass, customer service and rules (i.e., recognizing which pass denominations each agency needs to stock to accommodate its riders needs). By forcing the operating agencies to work together and think through the passenger experience, one of the benefits of the program has been to build better working relationships and trust among the participating agencies.

Staff also noted that the region's employer pass program has grown appreciably since the introduction of the PugetPass, which has enabled a single account for the multiple transit agencies in the region, thereby creating the potential for PugetPass to increase the market for transit trips.

PugetPass objectives include keeping each participating agency financially whole relative to base year data, by reimbursing each operator a full average fare for each originating boarding and 2/3 of an average fare for an inter-agency transfer boarding.

PugetPass sales proceeds are held in locally managed accounts at each agency. Sound Transit is responsible for reconciling proceeds among the participants, a complicated process that involves an on-board survey to determine ridership, transfer patterns, fare types and average fare per boarding. The five full participants share revenues collected from PugetPass sales on the basis of each operator's average fare per boarding and boardings forecasts. Average fares are updated at the beginning of each fiscal year, using actual data from the prior year. This method keeps each operator financially whole with respect to fare revenues.

In addition, the Regional Pass and Fare Program Reconciliation Agreement explicitly provides reimbursement to participating agencies for enabling customers to make inter-system transfers, to minimize the financial implications of transfer discounts. For inter-system transfers, the Agreement provides:

- **Local/Sound Transit Boardings:** Each Party shall receive two-thirds of its average fare per boarding for Local-Sound Transit boardings.
- **Local/Local Boardings:** Each Party shall receive the full amount of its average fare per boarding for Local-Local Boardings.

Sound Transit provides funding for transfers between the five transit agencies (King County Metro, Community Transit, Everett Transit, Pierce Transit and Sound Transit) by subsidizing the PugetPass revenue sharing agreement and transfers from Sound Transit to the local operating agencies

Sound Transit established a Fare Integration Fund that is used to cover any shortfall in PugetPass revenues. If revenues from Puget Pass sales are not sufficient to cover the amount due an operator, Sound Transit also subsidizes transfers from Sound Transit services to the local agencies. For each transfer, each operator is reimbursed at 2/3 of its average fare.

Sound Transit staff report that the revenue sharing arrangement generally works well because Sound Transit absorbs the revenue risk. Fare changes create impacts for all participants, but especially for Sound Transit

Ship-to-Shore PugetPasses permit travel on specific ferry routes and connecting transit agencies. The passes are sold at the combined total price of the applicable ferry pass plus the PugetPass that applies to the connecting transit service. **Each participant receives its own revenue share.**

A-2. EZ TRANSIT PASS (LOS ANGELES)

Fixed route transit services in the Los Angeles region are provided by the Los Angeles County Metropolitan Transportation Authority (LACMTA, Metro), the Southern California Regional Rail Authority (Metrolink), 16 "municipal" operators, and a large number of smaller operators providing specialized local services. Recognizing the potential market for a regional monthly pass to provide access to many if not all of the region's transit providers, MTA initiated a working group with local operators to define and agree on the parameters of a regional monthly pass. The result is the EZ Transit Pass, a flash pass that is accepted by 24 operators, replacing previously existing inter-operator passes, but neither inter-operator transfer agreements nor individual transit operator passes.

Operators agreed to participate on condition that they would be kept whole with respect to fare revenue, defining revenue neutrality in terms of an average fare per boarding. Operators are required to count and report EZ Transit Pass boardings (using farebox data or on-board surveys) and are reimbursed by LACMTA from EZ Transit Pass sales revenues at the rate of an annual average fare per EZ Transit Pass boarding reported. The EZ Transit Pass agreement defines the formula for calculating average fares and requires operators to recalculate their average fares annually using prior year actual data. Operators may use either a total average fare per EZ Transit Pass boarding or separate average fares for full fare (adult/student) and discounted (senior/disabled) passes. The distinction between full and discounted average fares was introduced in 2006 to increase the average fare reported for the majority of EZ Transit Pass boardings. Reported average fares and boardings are verified every three years through the TDA performance audit process.

Pricing Considerations

Since the market for regional passes is riders who regularly transfer from one system to another, EZ Transit Pass has been priced to offer convenience and some savings to riders. In pricing the pass, inter-operator transfer volumes were considered and a range of prices was identified that would be sufficient to keep the operators whole, assuming reimbursement at an average fare. Prior to the implementation of the pass, riders paying cash fares averaged $47-$57 per month for such trips; MTA passholders spent $52-$62 per month. In subsequent negotiations, agreement was reached on a price of $58 and LACMTA agreed to make a subsidy available to cover shortfalls. While this approach helped other

operators buy-in to the program, the subsidy has never been used. LACMTA reimburses the other operators on the basis of their average fares and reported EZ Transit Pass boardings and retains the remaining funds. Since LACMTA also provides the shortfall subsidy, the agency has also borne the risk associated with the program. However, revenues from EZ Transit Pass sales have always been sufficient to reimburse the operators and no subsidy dollars have been paid LACMTA to the other operators.

The price of the EZ Transit Pass is set by the LACMTA Board of Directors. The adult pass was introduced at $58 in August 2002 and increased to $70 in July 2007. Currently, 24 operators are participating, including Metro and 11 of the 16 municipal operators. Some operators, such as Santa Monica's Big Blue Bus and Culver CityBus, did not have monthly passes at the time the program was introduced. For those operators, the pricing of the pass was particularly important, so as not to undercut fare revenues. Although data are not readily available on operators' fares in 2002, Table A-3 shows current EZ Transit Pass prices and breakeven points relative to municipal operators' cash fares and monthly pass prices and breakeven points.

Table A-3: EZ Transit Pass Pricing

	Adult/Student	Senior/Disabled	
EZ Transit Pass	$70	$35	
Zone Charge	$18	$9.50	per zone, up to 10 zones

Transit Agency	Cash Fare	Pass Price	Agency's Pass Break Even	EZ Transit Pass Break Even	Pass Multiple Increment
Antelope Valley Transit Authority	$1.25	$50.00	40	56	16
Beach Cities Transit	$1.00	$40.00	40	70	30
Culver CityBus	$0.75	N/A	N/A	93	N/A
Foothill Transit - Local	$1.00	$66.00	66	70	4
Foothill Transit - Express	$4.40	$155.00	35	36	1
Foothill Transit - Silver Streak	$2.50	$96.00	38	50	11
Gardena Municipal Bus Lines	$0.75	N/A	N/A	93	N/A
Los Angeles Dept of Transportation - Dash	$0.25	N/A	N/A	280	N/A
LADOT - Commuter Express (+ 4 zones)	$0.90	$40.00	44	78	33
Metro	$1.25	$62.00	50	56	6
Metro + 2 zones	$1.85, $2.45	$80.00, $98.00	43, 40	48, 43	5, 3
Montebello Bus Lines	$0.90	N/A	N/A	78	N/A
Norwalk Transit	$0.60	N/A	N/A	117	N/A
Santa Clarita Transit - Local	$1.00	$25.00	25	70	45
Santa Clarita Transit - Express (2 zones)	$3.50, $4.00	N/A	N/A	41, 40	N/A
Santa Monica Big Blue Bus - Local	$0.75	N/A	N/A	93	N/A
Santa Monica Big Blue Bus - Express	$1.75	N/A	N/A	50	N/A
Torrance Transit- Local	$0.50	$30.00	60	140	80
Torrance Transit - Express	$0.75	$60.00	80	93	13

Between the times the EZ Transit Pass was introduced in 2002 and the price was increased in 2007, some operators increased their fares and began to experience competition from EZ Transit Pass as its price undercut the price of their monthly passes. This will be a recurring issue because EZ Transit Pass price adjustments are made independently of operator fare changes.

Ridership Impacts

LACMTA reported that the use of inter-operator transfers has declined, but was unable to provide data on other ridership impacts of the EZ Transit Pass program. The performance audits conducted in 2007 indicate that EZ Transit Pass

ridership increased consistently from 2004 through 2006, but there were no data on whether any of the boardings are attributable to new riders.

Program Administration

LACMTA functions as the clearinghouse and is responsible for printing and distribution costs. These activities are part of the administrative costs funded by the program, which were originally estimated at $2 million per year, primarily for pass production and distribution. That estimate has never been updated. The program is marketed by participants through their own marketing programs as well as regionally, through joint countywide marketing program. Passes are sold through existing operator outlets. Operators retain revenues from EZ Transit Pass sales and report the revenues as an offset to quarterly claims.

Lessons Learned

Building on personal and professional relationships, based on trust and credibility, was important in developing the program. It was particularly important to get some of the key operators on-board; once they committed, it became much easier to get other operators interested. It was also important the product be perceived as "regional." While LACMTA's marketing group designed the product, they worked with the EZ Transit Pass working group to ensure that the design was "regional" and did not look like another operator's fare products.

Appendix B: Glossary

The following definitions apply to the use of these terms both commonly, in the transit industry, and specifically for the purpose of this report.

Accumulator – A fare policy in which a rider uses a fare product that "accumulates" the number of trips the rider takes within a specified time period (e.g., a calendar month, a 7-day period, etc.). The rider is charged a per-trip fare until a specified threshold of trips is made within that period. After reaching the threshold, the rider is not charged a fare for additional trips made during that period.

Adult – A person who is not eligible for an age-based discount. The definition of adult varies among transit providers. For example, an adult is a person from 18-64 years of age for a transit agency that offers discounts for children/youth under age 18 and for seniors over age 64.

Average Fare – The average amount of fare revenue that a transit provider receives per trip made (total fare revenue divided by total unlinked boardings).

Bay Area – Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. These counties represent the jurisdiction of the Metropolitan Transportation Commission (MTC), the Metropolitan Planning Organization (MPO) for the region.

Bay Area Transit Provider [or Transit Operator or Transit Agency] **–** The transit providers that operate within the Bay area. These are AC Transit, Bay Area Rapid Transit (BART), Benicia Breeze, Caltrain, Cloverdale Transit, County Connection, Fairfield-Suisun Transit, Golden Gate Transit, Healdsburg In-City Transit, Petaluma Transit, Rio Vista Delta Breeze, San Francisco MTA (Muni), SamTrans, Santa Clara VTA, Santa Rosa CityBus, Sonoma County Transit, Tri-Delta Transit, Union City Transit, Vacaville City Coach, Vallejo Transit, VINE (Napa County), WestCAT, and WHEELS (LAVTA). Ferry service providers are also included: Alameda Harbor Bay Ferry, Alameda/Oakland Ferry, Blue and Gold Fleet (Sausalito & Tiburon), Golden Gate Ferry, and Vallejo Baylink Ferry.

Boarding – A boarding occurs each time a rider boards or enters a transit vehicle.

Cash Fare – The fare that applies to a rider who pays with cash to ride a particular transit service.

Day Pass – A pass product that enables a rider to make unlimited trips on a particular transit service or group of services on a specific day.

Destination – Location where a rider ends a particular transit trip.

Disabled – A person who is eligible for reduced transit fares on the basis of having a qualifying disability.

Distance-Based Fare – A fare structure in which the fare varies based on the distance that a rider travels.

Distributor Service – A local transit service that takes a rider from the endpoint of a regional transit service to the rider's final destination.

E-Cash (or E-Purse) – In the transit fare context, electronic cash ("e-cash") is a capability of chip-embedded fare cards (i.e., smart cards) to hold and access money (in addition to other fare products such as passes or stored trips). E-cash can be used to purchase fare products such as passes or tickets, or to pay a cash fare directly.

Fare Elasticity – The measure of the sensitivity of transit riders to fare changes. Fare elasticities measure the percentage change in ridership that can be expected from a 10% increase (or decrease) in fares. Fare elasticities fall between 0.0 and -1.0, indicating that transit riders are generally sensitive to price, so an increase in price will result in a decrease in ridership. The Simpson and Curtin formula, which was used as the rule of thumb for transit fare changes for many years, said that a 10% increase in fares would result in a 3.3% decrease in ridership (an elasticity of -0.33). In 1991, the American Public Transportation Association (APTA) published a study of transit fare elasticities, concluding that on average, a 10% increase in bus fares would result in a 4.0% decrease in ridership (elasticity of -0.40).[9] The study also concluded that riders were less price sensitive during peak (i.e., commute) times of day and in cities with populations over one million:

[9] *American Public Transportation Association, Fare Elasticity and its Application to Forecasting Transit Demand (1991).*

Average elasticity, all hours, all cities	-0.40	
Peak hour average, all cities	-0.23	
Off-peak hour average, all cities	-0.42	
	Cities > 1 million	**Cities < 1 million**
Peak hour average	-0.18	-0.27
Off-peak hour average	-0.39	-0.48
All hours	-0.36	-0.43

Fare Policies – Policies associated with the fares that riders pay to ride a particular transit service or group of services. Fare policies include the fare structure (the mix of fare products offered), pricing, discounts, and the privileges and requirements associated with each fare product. Fare policies reflect a transit agency's strategies for achieving its fare-related goals and objectives.

Fare Product – A valid form of payment that a person may use to ride a transit service. Example fare product types include cash (bills or coins), tokens, paper (passes, tickets, or transfers), magnetic stripe cards, or TransLink® smart cards.

Fare Revenue – The amount of revenue that a transit provider collects from rider fares, including per-trip fares (paid at the time a trip is made), pre-paid fares (paid by a rider in advance of a trip, such as passes and tickets), and negotiated fare agreements (for example, an agreement between a transit provider and a college or university in which the school agrees to reimburse the transit agency for providing service to students/faculty/staff).

Fare Structure – The fare products and associated pricing offered by a transit provider.

Fare Zone – Geographic areas defined by fare policies for purposes of assessing distance-based fares.

Feeder Service - A local transit service that brings a rider from the rider's origin to the starting point of a regional transit service.

Frequent Transit Users – Commuters who use transit frequently but not always (e.g., use transit some days and drive other days. These riders may be enticed by a monthly pass that pushes them to reach a threshold number of trips per period (as defined for the Integrated Fare Study).

High Load Bonus - A fare policy that provides a bonus (i.e., additional fare revenue) to riders who purchase or add high values (e.g., possibly $20 or more) to a stored value fare card. For example, a 10% bonus when adding $20 in value would provide $22 in stored value.

Integrated Fare [or **Regional Fare**] – [definition from Senate Bill 916, the authorizing legislation for Regional Measure 2, as codified in Section 30914.5(e) of the California Streets and Highways Code] – A fare that encourages greater use of the region's transit network by making it easier and less costly for transit riders whose regular commute involves multizonal travel and may involve the transfer between two or more transit agencies, including regional-to-regional and regional-to-local transfers. The stated purpose of the Integrated Fare Study is to develop a plan for the integrated fare program envisioned by the legislation.

Inter-Operator Fare Agreement – A negotiated agreement between two or more transit providers pertaining to fare policies for riders who use the services of more than one transit provider. An inter-operator fare agreement may designate a fare product specifically for inter-operator trips (e.g., transfers, joint passes) and/or an agreement for how fare revenue will be shared among two or more transit providers.

Inter-Operator Transfer – A transfer made by a rider from a transit service operated by one transit provider to a transit service operated by a different transit provider.

Interzonal Trip – A trip made by a rider that crosses two or more fare zones.

Linked Trip – A complete one-way trip from a rider's initial origin to final destination. A linked trip may involve one or more boardings (or unlinked trips), and may involve one or more transit services or providers.

Load Discount - A fare policy that provides a discount to riders who purchase or add values above a specific threshold (e.g., possibly $20 or more) to a stored value fare card. For example, a 10% discount would provide $20 in value when for a cost of $18.

Local Fare Credit – Associated with transfers agreements that allow a rider to board a connecting service at no additional charge. Transfers that do not require any additional cash payment effectively provide a credit for the equivalent of a local fare on the connecting service.

Local Service – A transit service that operates within a local area and is not regional in nature. Local services include feeder services, distributor services, and services that do not involve transfers to or from regional services.

Mode Share – The share of total regional trips that is attributed to a particular mode of transportation (e.g., transit, automobile).

Monthly Pass - A fare product that enables a rider to make unlimited trips on a particular transit service or group of services within a single calendar month. A monthly pass-based integrated fare product must be evaluated by the Integrated Fare Study.

Non-Transit Users – Commuters who do not use transit, but who could be a market for transit and for an integrated fare, if transit services are available to meet their needs (as defined for the Integrated Fare Study).

Origin – Location where a rider begins a particular transit trip.

Partial Transit Users – Commuters who use transit for part of a commute trip, but not for the entire trip, such as riders who drive to a park-n-ride or a train station (as defined for the Integrated Fare Study).

Pass Multiple – The pricing of a pass product as a multiple of the cash fare; the number of trips a rider must make during the validity period of a pass to break even between paying cash fares and the price of the pass. A rider who makes more trips during the validity period than the pass multiple saves on fare payments by buying a pass instead of paying cash for each trip.

Regional Hub – As defined by the Integrated Fare Study, a location that serves at least three transit operators of which at least one must be one of the regional rapid transit providers or a ferry service.

Regional Measure 2 (RM2) – the Bay area initiative, authorized by Senate Bill 916, that approved a $1 increase in the tolls on state-owned toll bridges in the Bay area. The development of an Integrated Fare Program Plan is one of the requirements of the Measure, which was approved by Bay Area voters on March 2, 2004.

Regional Rapid Transit (or **Regional Service**) [definition from Senate Bill 916, the authorizing legislation for Regional Measure 2, as codified in Section 30914.5(e) of the California Streets and Highways Code] – Long-haul transit services that cross county lines, and operate mostly in dedicated rights-of-way, including freeway high-occupancy vehicle

lanes, crossing a bridge, or on the bay. Interregional rail services, originating or terminating from outside the Bay Area, are not considered to be regional rapid transit.

Regional Service Provider – The transit providers that operate regional services in the Bay Area, based on RM2's definition of regional rapid transit and ridership volumes. The regional service providers are AC Transit, Bay Area Rapid Transit (BART), Caltrain, Golden Gate Transit, San Francisco MTA (Muni), SamTrans, and Santa Clara VTA. Also included are ferry service providers: Alameda Harbor Bay Ferry, Alameda/Oakland Ferry, Blue and Gold Fleet (Sausalito & Tiburon), Golden Gate Ferry, and Vallejo Baylink Ferry.

Regional Transit Service – Transit services that meet the definition of Regional Rapid Transit.

Regional Travel Demand – Information on travel patterns in the Bay Area, including inter-county commute trips and transit shares of those trips, inter-county daily transit ridership by operator, and inter-operator transfer volumes. This information is key to understanding the potential demand for an integrated fare product in the Bay Area.

Regional Zones – A system of geographic areas, or zones, for the purpose of implementing a zone-based integrated fare. A zonal fare system for the integrated fare product is a requirement of Senate Bill 916, the authorizing legislation for Regional Measure 2, as codified in Section 30914.5(e) of the California Streets and Highways Code.

Revenue Neutral – A fare policy change is revenue neutral when it does not appreciably affect the amount of fare revenue that a particular transit provider collects.

Revenue Sharing Agreement – A documented agreement for how fare revenue from a fare product accepted by more than one transit provider will be shared among those transit providers.

Rider – A person who uses transit.

Ridership (see also Boarding, Linked Trip, Unlinked Trip) – The number of unlinked boardings, or unlinked trips, made on a particular transit service or group of services within a specified period of time.

Rolling Period Pass – A pass product that enables a rider to make unlimited trips on a particular transit service or group of services within a period of time that begins when the rider first uses the pass product. The period is "rolling" because it begins when the rider activates the pass and is not necessarily linked to a designated calendar period (e.g., a specific day, week, or month).

Senior – A person who is eligible for reduced transit fares on the basis of meeting or being older than a specified age, typically age 60, age 62, or age 65.

Stored Value – A pre-paid amount of fare payment for a particular transit service or group of services. The value is stored on a fare product such as a TransLink® smart card or a magnetically-encoded fare card such as the BART fare card.

Transfer – A transfer is made when a rider alights (exits from) one transit service and boards another transit service in order to complete a single one-way, or linked, trip. Depending on a transit provider's fare policies, a transferring rider may be allowed to board another transit service for free or at a discount, within a specified time period.

Transit Mode Share – The share of total regional trips that uses transit as the mode of transportation.

TransLink® - A smart card that provides riders a more convenient way to pay for transit rides in the Bay Area. Riders may encode TransLink® card with cash or pass products. TransLink® will be the medium for the Integrated Fare.

Trip-Based Fare Product – A fare product that enables a rider to make a certain number of trips on a particular transit service or group of services (e.g., 10- and 20-trip tickets are common in the Bay Area). A trip-based fare product may have an expiration date.

Trip Value Monthly Pass – A monthly pass valid for transit trips of up to and including a specified cash fare, or trip value.

Universal Pass – A fare product that allows a rider to makes unlimited trips during a specified period (usually a month) throughout a region that is defined by fare zones. Whereas most riders would be likely to purchase passes valid between two specific fare zones, the market for a universal pass is those riders wishing to travel throughout the region.

Unlinked Trip – A trip made by a rider on a single transit vehicle. A rider may need to make multiple unlinked trips in order to complete a single one-way, or linked, trip.

Validity Period – The period of time during which a pass product is valid for a particular transit service or group of services.

Weekly Pass - A pass product that enables a rider to make unlimited trips on a particular transit service or group of services during a specific calendar week.

Youth - A person who is eligible for reduced transit fares on the basis of being within a particular age range for younger persons, such as ages 12-17.

Zone-Based Fare – A fare structure based on the number of zones traveled.