San Leandro LINKS Service Alternatives

Final Report

June 2014

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1 INTRODUCTION

PROJECT CONTEXT

Since its inception in 2001, the LINKS shuttle service has served businesses within West San Leandro and has provided a vital transportation link between its service area (Figure 1) and the San Leandro BART Station. The service has demonstrated its value to the community through the overwhelmingly positive feedback from riders (90% responded that shuttle service was good to excellent), high ridership productivity, and general ridership growth over the past decade. The service is funded through a variety of sources including local and regional grants. A large portion of funds (45% over the past three years) come from a business improvement district (BID) that is formed by businesses within one-quarter mile of the existing shuttle alignment.

As of January 2014, several important factors are present that warrant investigation of potential shuttle modifications. These include:

- **BID Re-establishment:** The current BID expires at the end of the 2013-2014 Fiscal Year (June 30, 2014). Assuming that the BID will be renewed and a strong interest to continue the LINKS service exists, the timing is right to suggest service modification and potential expansion during this renewal period.
- **Strong interest in enhancing the LINKS service:** Based on a recent presentation at a San Leandro City Council *Next Generation Workplace District* Work Session, "LINKS Improvement" was listed as the highest ranked priority among 17 other topic areas. This reflects a major interest in enhancing the LINKS service beyond what it provides today.
- **New growth and development in West San Leandro:** A recent influx of new businesses, findings from the West San Leandro *Next-Gen Workplace District Study*, the opening of the Kaiser Permanente Hospital Complex, and a general economic recovery warrant revisiting the existing LINKS alignment to determine if it is the right service for the district. Changes in employment types and concentration of activities could suggest service alignment changes or need for increased shuttle frequencies and capacity.
- **National trend in transit-ridership growth:** Numerous studies and federal transportation reports have continued to show a trend of younger workers driving less and preferring other modes such as transit and biking for commuting. This trend is evident in the Bay Area and is further bolstered by transportation alternatives such as bikesharing and carsharing, which have been shown to reduce personal car ownership. To cater to this generation of workers, there is an expectation of effective transportation alternatives that reduce the need to rely on a personal vehicle.

The purpose of this report is to describe several routing alternatives that could be pursued for future LINKS service. The alternatives assume various funding levels (based on number of vehicles available for service).

Chapter 2 (Service Plan) outlines these alternatives and provides a recommendation for future LINKS Shuttle service. Chapter 3 provides information on elements to help support the Service Plan. Finally, Chapter 4 provides next steps for implementation pending funding becoming available to implement the recommended alternative.

Figure 1 LINKS Service Area and Route

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2 SERVICE PLAN

SERVICE CRITERIA

The primary service objectives that factored into future alternatives include the following:

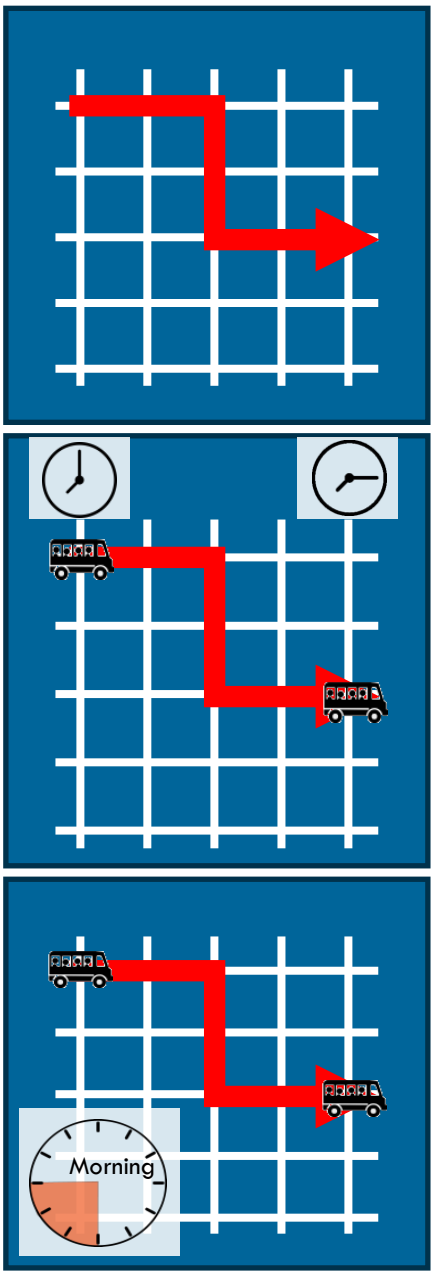
- Enhance service frequency and route directness (to minimize travel time) for members of the current BID
- Expand service to the current BID "gap" on Marina Boulevard and Williams Street (e.g. investigate different shuttle routing before service span changes)
- Ensure service is designed to complement and/or supplement existing AC Transit service and is coordinated with the proposed Kaiser LINKS Shuttle services
- Develop service that provides a foundation for future transit ridership growth and potential BID expansion

To achieve these criteria, several variables are in play including route alignment, route frequency, and service span. Each of these variables and potential alternatives are outlined in the following sections. Figure 2 provides a brief description of each of these characteristics and how they may factor into a LINKS Shuttle service plan.

ALIGNMENT AND FREQUENCY

The alternatives are guided by the service objectives denoted above. In addition, the alternatives describe **bus alignment** and **potential frequencies** based on resource assumptions. Service span (duration of service day) will be discussed in a following section. For planning purposes, this service plan assumes resources will be available for additional vehicles as compared to the two shuttles that operate today. The actual costs associated with the different alternatives will vary based on service span, which may include operating services mid-day and later into the evening.

Figure 2 Description of Alignment, Frequency, and Service Span



Alignment: Route alignment is the actual path that a bus or shuttle travels within a service area. Alignment decisions should be based on directness of desired travel and providing access to passenger destinations. The route alignment will also factor in to how long a shuttle takes to complete its route.

Frequency: Route frequency is the number of buses per hour or the elapsed time between consecutive buses. Frequency for circulator shuttles is typically less than 20 minutes. If frequencies are less than 15 minutes, riders will often not require a schedule. Higher frequencies are more convenient for passengers as it allows them to be flexible in their own personal schedules. Higher route frequencies either require shorter alignments or more vehicles.

Service Span: Service span describes how long a shuttle service operates. Currently, the LINKS service is "peak only," meaning it only operates during certain periods of the day. Lengthening the service span (mid-day or later evening) may expand the service to different types of riders.

Single Route Alignment (Existing)

Keeping the existing alignment is only suggested in a scenario where either resources remain flat or increase slightly to provide a third bus (currently two buses operate on the route). There is an opportunity to increase service frequency if increasing service to three vehicles, and the alignment benefits from the use of existing stops and infrastructure on the route. Furthermore, the existing route is already known by local businesses and riders. However, any alternative that utilizes the existing alignment has little to offer in terms of service improvement. Utilizing the existing alignment does not change or expand the existing service area nor does it remedy an existing challenge of long vehicle ride times (approximately 40 minutes round trip).

Existing Alignment - Three Vehicles

If a third vehicle were to become available, this alternative proposes simply adding the third vehicle onto the existing route. This would maintain the existing service area but would improve shuttle frequency to approximately every 12-15 minutes.

A variation on the current LINKS service could include clockwise (versus the current counter-clockwise) loop to take advantage of right turns, which may slightly reduce operating time. However, this may require additional capital costs for bus stop and/or signage improvements. Given the limited added value for the cost of new infrastructure, this alternative is not recommended at this time.

Figure 3 below presents a summary of this service alternative.

Figure 3 Existing Alignment – Three Vehicles Service Summary

Route(s)	Estimated Frequencies[1]	Vehicle Requirements	Key Destinations
LINKS Loop	12-15 minutes	3 (+ 1 from current)	All existing destinations on LINKS Shuttle
Estimated Additional Resource Requirements	+1 vehicle total: +**$126,500** operations/annually		
Benefits • Rider familiarity • Additional service frequency		**Drawbacks** • Does not expand service area • No improvement of route travel times • Could incur additional costs due to bus stop improvements (if utilizing clockwise service)	

A map of the existing alignment including other local AC Transit routes is shown in Figure 4. As a point of reference, the current route is operated with two vehicles with an arrival frequency of approximately 20 minutes.

[1] All frequencies described in this document are estimated and require field testing by the selected shuttle vendor for verification of accuracy.

Figure 4 Existing Alignment

North/South Routes Alignment

Although the current loop alignment provides some benefits in its simplicity and rider familiarity, its shortcomings include the long ride times associated with traveling the full length of the route and its limited service coverage, particularly in the center of the current shuttle service area. As a result, an alternative that divides the one route into two is preferable. Figure 5 describes some of the tradeoffs of a single versus North/South Route scenario in the West San Leandro area.

Figure 5 Tradeoffs of North/South versus Single Shuttle Routes

Single Route (Existing)		North/South Routes	
Benefits	**Drawbacks**	**Benefits**	**Drawbacks**
• Ability to focus resources on one service • Simplicity to riders • Use of existing infrastructure	• Long route travel times • Limited coverage area • Inability to differentiate routes based on specific rider markets	• Able to design for more direct service • Opportunity to expand service area • Ability to differentiate routes based on market needs using alignments and frequency	• Requires additional resources in order to maintain 20 minute or better frequency on routes • Potential for rider confusion (temporary)

Service Overview

Given the potential benefits and service improvements associated with a North/South Routes alternative, we have analyzed several possible variations and have finalized a preferred alignment that features two routes. This alignment was developed in collaboration with San Leandro LINKS staff. Its design also meets the service criteria and provides several other benefits:

- Provides two-way service to Marina Square, a major retail hub and other destinations on Marina Boulevard
- Improves service frequency and bus stop proximity to Westgate Center
- Provides overall shorter round-trip times for both routes as compared to the existing loop service
- Provide direct service on Williams Street (future 21st Amendment Brewery)

For this alignment, it will be assumed that no fewer than four shuttle vehicles are available for service. Any number of vehicles below four will result in less than 20 minute frequencies for at least one of the two routes, the baseline of service that customers experience today. As an example, in a three shuttle scenario, vehicles would need to be split between two routes. One route would operate with two vehicles and the other with just one. Neither of the two routes suggested can consistently maintain 20 minute frequencies with a single vehicle. "Interlining" shuttle vehicles (combining the two routes into one for operational purposes) is ruled out due to the potential for rider and operator confusion. A scenario with five vehicles is also analyzed as a means to improve service frequency on one of the two routes to approximately 12-15 minutes, better matching with peak-hour BART train arrivals and departures at the San Leandro BART Station. All alternatives described below are assumed to operate independently from the proposed Kaiser LINKS Shuttle service. However, it is possible that services will coordinate in the future in terms of branding and operations.

Route Descriptions

The routing of this alternative is found in Figure 8 and reflects both a North (blue) and a South (red) route. Both loops are described in greater detail below.

North Loop (Blue)

The North Loop is designed to provide frequent service to the district's major retail hubs including Westgate Center, Marina Square, and potential future developments along Williams Street. This loop is approximately 4.7 miles (round-trip) and improves upon the existing alignment by reducing the travel time to and from the BART Station to its respective destinations. Among the two proposed routes, the North Loop is intended to have a higher level of service to some of the largest employment centers and retail establishments in West San Leandro. In this routing, the bus departs the San Leandro BART Station and travels south along San Leandro Boulevard before turning west onto Marina Boulevard. The bus then travels onto Merced Street and Williams Street before making right hand onto Doolittle Drive and Davis Street on its way back to the BART Station. A clockwise loop was selected to allow for right turns within the loop, which is intended to reduce travel delay.

South Loop (Red)

The South Loop is designed to provide a similar level of frequency as current service and slightly reduce the overall travel time on the loop as compared to today. It retains much of the southern portion of the LINKS service including the Davis Street Family Resource Center, Farallon Drive, and a majority of the existing Doolittle Drive service. The loop also includes Marina Boulevard and service to Marina Square. The service is now designed to operate a counterclockwise loop to take advantage of right turns, which will help reduce overall service variability. The loop no longer travels along Davis Street or Doolittle drive (north of Marina Boulevard) as these segments will now be covered by the North Route. The approximate round-trip distance is 6.6 miles as compared to the existing total route distance of 7.2 miles.

Further information about proposed route frequencies and resource requirements are highlighted in Figure 9 and Figure 10. An additional proposal suggests realigning the South Route to follow Marina Boulevard to San Leandro Boulevard, avoiding portions of Williams Street and Alvarado Street. This recommendation would slightly decrease travel times and delay associated with school traffic congestion. In addition, it would provide the bus a protected left turn signal from Marina Boulevard to San Leandro Boulevard. This alignment may also increase the number of businesses that have access to the shuttle service on Marina Boulevard between San Leandro Boulevard and Alvarado Street.

Figure 6 North/South Routes – New Service Areas

The North/South Routes will expand the current LINKS Shuttle service area to include more direct service to Westgate Center (top left), portions of Williams Street (top right) and Marina Boulevard. Marina Square (bottom) will receive service from both the North and South Route.

One of the major advantages of two shuttle routes is the reduction in on-board round-trip travel time. Today, all LINKS riders have an approximate 40-minute round-trip travel time from the San Leandro BART Station to their destination and then back to the San Leandro BART Station. The North Route reduces this travel time by ten minutes and the South Route by five minutes.

Figure 7 Estimated On-board Round-trip Travel Time (Including Shuttle Layover Time)[2]

Route	Round-trip Travel Time[3]
Existing Route	**40 minutes**
Proposed North Route	30 minutes
Proposed South Route	35 minutes

[2] Layover time includes extra non-moving time built into a shuttle schedule to accommodate for delays and short driver breaks. During periods with traffic congestion, there may be no layover time.

[3] For planning purposes, five minutes of layover time have been added to the proposed north and south routes. The actual tested run times (June 2014) are 25 minutes and 30 minutes, respectively. Run times provided by MV are included in Appendix C

Figure 8 North/South Routes Alternative

North/South Routes - Four Vehicles

A North/South Routes LINKS Service provides numerous benefits but also requires an increase in the current number of vehicles to maintain and/or improve service. In a four vehicle scenario, service frequency improves for the North Route, and there is an overall service area expansion. Figure 9 describes basic service information of this alignment if four vehicles were available for service.

Figure 9 Benefits and Drawbacks of North/South Loops (4 Vehicle) Alternative

Route Name	Estimated Frequencies[4]	Vehicle Requirements	Key Destinations
LINKS North Loop (Blue)	Approximately every 15-18 minutes	2	Westgate Center, Marina Square
LINKS South Loop (Red)	Approximately every 17-20 minutes	2	Davis Street Family Resource Center, Farallon Drive, Doolittle Drive, Marina Square
Estimated Additional Resource Requirements[5]	4 total vehicles (+2 vehicles) **+$253,100 (operations/annual)**		
Benefits • Reduces shuttle round-trip travel time • Connects major retail centers in West San Leandro to BART • Improves frequency (North Route) • Expands existing service area		**Drawbacks** • Additional costs for additional shuttle vehicles • Potential for additional rider confusion (temporary) • Costs of new infrastructure related to stops[6]	

North/South Routes - Five Vehicles

Between the two routes, the North Route (Blue) is suggested for a higher frequency of service given its orientation around retail establishments that incur all-day trips. These trips match shopping habits and a variety of employment shift start and end times. If an additional (fifth) vehicle became available, it is recommended to add this vehicle to the North Route, increasing its service frequency to approximately 10 minute service. At this level of frequency, shuttle departures from the San Leandro BART Station could nearly match the bi-directional service frequency for arriving trains. Figure 10 presents the basic service characteristics of this alignment.

[4] Estimated frequencies are based on a MV Transportation daytime field test in June 2014. Variances in frequency are used to reflect potential traffic conditions during peak periods.

[5] Assuming equivalent service spans (weekday only, peak service), an additional two vehicles will add approximately $253,100 annually based on a 2014 shuttle cost per hour of $53.65. In 2015, it is estimated that shuttle costs per hour will increase to $56.96 (+6%). Assumes 255 service days (weekdays) per year at 9.25 service hours per day.

[6] Costs associated with adding or improving bus stops will depend on a site-by-site basis. The Implementation Plan (Chapter 4) suggests conducting a Bus Stop Assessment that will review all existing LINKS bus stops and determine which stops require improvements. The assessment should also review locations for new bus stops based on the proposed North/South Route alignment.

Figure 10 Benefits and Drawbacks of North/South Loops (5 Vehicle) Alternative

	Estimated Frequencies[7]	Vehicle Requirements	Key Destinations
LINKS North Loop (Blue)	Approximately every 10-13 minutes	3	Westgate Center, Marina Square
LINKS South Loop (Red)	Approximately every 17-20 minutes	2	Davis Street Family Resource Center, Farallon Drive, Doolittle Drive, Marina Square
Estimated Additional Resource Requirements	5 total vehicles (+3 vehicles total) **+$379,600 (operations/annual)** [8]		
Benefits • Improved frequency for North Route • Other benefits similar to Four Vehicle Alternative		**Drawbacks** • Additional costs for additional shuttle vehicles • Other drawbacks similar to Four Vehicle Alternative[9]	

Future Route Modifications

The routing recommendations suggested in this report are based on near-term development patterns and potential ridership demand. However, over the next several years, development may begin to accelerate in other portions of West San Leandro, particularly along Marina Boulevard and Merced Street just North of the new Kaiser Hospital facility defined by the *Next Generation Workplace District Study*. In the future, Marina Boulevard and portions of Merced Street (between Williams Street and Fairway Drive) may warrant renewed attention and shuttle service modifications to improve service along these corridors.

In addition, future coordination opportunities exist with the Kaiser LINKS Shuttle service. Potential options include joint branding of vehicles, services, and schedules and sharing of resources to leverage more frequent shuttle service. Appendix B presents a potential consolidation of services with the Kaiser Shuttle.

SERVICE SPAN

In addition to service alignments and frequencies, another major shuttle component is service span. Service span refers to total revenue hours during which the service operates throughout the day. Presently, the LINKS Service operates during weekday peak hours (5:45 a.m.-9:45 a.m. then 3:00 p.m.-8:00 p.m.)[10], for a total daily service span of approximately nine hours. Modifications in service span do not necessarily require additional vehicles, but they may require additional resources in order to provide service expansion to provide later service or offer mid-day service.

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[7] Estimated frequencies are based on a MV Transportation daytime field test in April 2014. Variances in frequency are used to reflect potential traffic conditions during peak periods.

[8] Assuming equivalent service spans (weekday only, peak service), an additional two vehicles will add approximately $379,600 annually based on a shuttle cost per hour of $53.65. In 2015, it is estimated that shuttle costs per hour will increase to $56.96 (+6%) Assumes 255 service days (weekdays) per year at 9.25 service hours per day.

[9] Regarding bus stop improvements, see footnote 5.

[10] As of March 2013, the last evening shuttle bus departs BART at 7:00 p.m.

Based on feedback from rider outreach and stakeholder feedback, it was determined that demand exists for later evening service and mid-day service. If these types of service were to be provided, it is suggested that service spans be modified across both routes to reduce rider confusion. However, limited resources may result in the modification of just one route, or the addition of just one type of service for both routes.

Evening Service

Between 2008 and March 2013, LINKS service operated as late as 8:00 p.m.[11], but was cut back to 7:00 p.m. due to reductions in funding. In the future, 8:00 p.m. service should be reconsidered as interest in later evening service was raised frequently during stakeholder interviews and survey responses from LINKS riders (46%, the plurality of respondents, desired later evening service). Restoring evening service until 8:00 p.m. would require extending service by one hour for each vehicle in service per weekday. Unfortunately, historical LINKS ridership information between 7:00 p.m. - 8:00 p.m. is unknown because LINKS ridership data has traditionally been aggregated by day and shift, but not by hourly time period.

Mid-Day Service

Currently, LINKS operates a peak-hour only service which focuses on typical business hours of operations. However, this cannot accommodate trips that occur mid-day (between 9:45 a.m. and 3:00 p.m.). Mid-day trips that may be missed under LINKS service include retail jobs, shopping trips, medical appointments, and mid-day errands. LINKS may consider offering mid-day service at a full or reduced frequency service compared to peak-hour trips. For planning assumptions, it is assumed that mid-day service would add 5.25 hours per vehicle to the existing service span.

SUMMARY

This section summarizes alignment, frequency, and service span options for the LINKS Shuttle.

Service Alignment and Frequency

Figure 11 describes both the Existing Alignment and the North/South Routes Alignment, including the service characteristics based on number of vehicles in service. To simply add a third vehicle to the existing alignment, the additional operational cost (based strictly on cost per hour of vehicle service) is approximately $126,500 annually. On the other end of the spectrum, to operate a five vehicle service on two routes would add approximately $379,600 in vehicle operations cost to current operational costs. Costs estimates are based on proposed 2014 LINKS cost per hour estimates ($53.65/hour), five days per weekday and 255 weekdays per year. It is estimated that LINKS cost per hour will escalate in 2015 from $53.65 to $56.96, a 6% increase.

[11] In 2001, LINKS originally operated afternoon services between 3:00 p.m. - 7:00 p.m. In 2005, the San Leandro Transportation Management Organization (SLTMO) obtained a grant to extend service hours to the Davis Street Family Resource Center and began operating this service between 2:00 p.m. – 8:00 p.m. This level of service stopped in 2008 due to the loss of grant funding for the enhanced service to the Davis Street Family Resource Center. At that time, the route time shifted to 3:00 p.m. – 8:00 p.m. In March 2013, due to funding constraints, the route hours were restored to the original (2001) schedule of 3:00 p.m. – 7:00 p.m.

Figure 11 Service Alignment Options

		Estimated Frequencies	Vehicle Requirements	Estimated Round Trip Distance (Miles)	Estimated Round-Trip Cycle Time (Minutes)	Estimated Additional Annual Costs[12]
Existing Alignment						
Existing Service	LINKS Loop	20 minutes	2	7.2	40	No change
Three Bus Service	LINKS Loop	Approximately every 15 minutes	3	7.2	40	**3 total vehicles** +1 vehicles total: **+$126,500 operations/annually**
North/South Routes Alignment						
Four Bus Alternative	LINKS North Loop	Every 15-18 minutes	2	4.6	25	**4 total vehicles** +2 vehicles total: **+$253,100 (operations/annual)**
	LINKS South Loop	Every 17-20 minutes	2	6.6	35	
Five Bus Alternative	LINKS North Loop	Every 10-13 minutes	3	4.6	25	**5 total vehicles** +3 vehicles total: **+$379,600 (operations/annual)**
	LINKS South Loop	Every 17-20 minutes	2	6.6	35	

Service Span

Figure 12 provides cost estimates for service span modifications. Costs estimates are based on proposed 2014 LINKS cost per hour estimates ($53.65), five days per weekday and 255 weekdays per year. Costs provided also reflect additional operational costs to what is paid today for LINKS services. This figure attempts to provide an order of magnitude cost estimate based on number of vehicles in service and the proposed service span modification. It is estimated that LINKS cost per hour will escalate in 2015 from $53.65 to $56.96, a 6% increase.

Based on the information above, one could "piece together" approximate costs of vehicle expansion with potential service span modifications. As an example, a shuttle alternative may require four vehicles, yet it is possible to operate a different number of vehicles during mid-day service or during later evening service at a lower frequency.

Two near-term options suggested for the LINKS Shuttle include restoring evening service (8:00 p.m.) and expanding service to include mid-day trips. Costs related to adding an hour of evening service range from approximately $27,000 to $68,000 annually, based on the number of vehicles. Adding mid-day service is substantially more costly due to the number of additional hours of service (5.25 hours per vehicle between 9:45 a.m. and 3:00 p.m.). Adding this service ranges between approximately $143,000 and $359,000 on an annual basis depending on the number of vehicles in service.

[12] Cost estimates assume a 9.25 service day (peak period weekdays). Based on 2014 cost estimates.

Figure 12 Service Span Options

Service Span Modification	Total Vehicle Assumptions	Additional Daily Hours of Service	Estimated Additional Annual Costs[13]
Restore Evening Service to 8:00 p.m. (+1 hour)	2	+2	$27,400
	3	+3	$41,000
	4	+4	$54,700
	5	+5	$68,400
Add Mid-Day Service (9:45 a.m.-3:00 p.m., +5.25 hours)	2	+10.5	$143,600
	3	+15.75	$215,500
	4	+21	$287,300
	5	+26.25	$359,100

The additional cost associated with service improvements is based on the total number of vehicles in service. As an example the approximate cost associated with restoring evening service and adding mid day services for three vehicles would be $256,500/annually ($41,000 + $215,500)

[13] Cost estimates are based on an estimated 255 service days per year at a cost of $53.65 per shuttle hour of customer service (2014 costs per hour). It is estimated that LINKS cost per hour will escalate in 2015 from $53.65 to $56.96, a 6% increase.

SERVICE PLAN RECOMMENDATION

Based on the research on existing service, feedback from LINKS and City of San Leandro staff, and the proposed service options, the following service modifications are recommended (in order of priority).[14] Figure 13 outlines four recommendations that include both route and frequency changes and service span changes that could be implemented in the upcoming years. Additional information about implementation can be found in Chapter 4 (Implementation Plan).

Figure 13 Service Plan Recommendations (In Order of Priority)

Priority	Service Recommendation	Justification
1	Implement North/South Route Service (4 total vehicles)	Two routes with four total vehicles will provide an increased level of transit service to the majority of the existing LINKS service area while expanding the service area to include Marina Boulevard and providing service on Westgate Parkway. This service recommendation will provide the greatest impact for transportation options in West San Leandro.
2	Restore Evening Service (4 total vehicles)	Based on rider feedback, extended evening service is a high priority. It is recommended that service be restored to its original end time with the last LINKS Shuttle(s) departing BART at 8:00 p.m.
3	Add Mid-Day Service (2 buses, North Loop Only)	As funds and resources become available, it is suggested that service be expanded to provide mid-day service, specifically to serve businesses with retail functions. This recommendation suggests first adding mid-day service on the North Route which serves Westgate Center.
4	Add Mid-Day Service (4 buses, Both Loops)	As funds and resources become available, it is suggested that mid-day service be provided to both loops (North and South Loop).

[14] These service recommendations assume that Kaiser LINKS services will continue to operate separately. However, if an opportunity arises in the future to further coordinate or integrate LINKS services under one livery and service plan, that should be strongly considered as an opportunity to share resources and route efficiencies.

3 SUPPORTIVE RIDER AMMENITIES AND IMPROVEMENTS

To properly support proposed service changes, some capital improvements are critically important to the success of the LINKS service. Although the LINKS shuttle is able to generate strong ridership, it would take a new, unfamiliar rider a great deal of effort to understand the system and feel confident on how to use the service. This will be particularly true if the routes are split into two. The most notable barriers to current use of the system include passengers crossing busy streets in the road network, inconsistent use of bus stop signage, and a lack of real-time arrival information. The San Leandro Transportation Management Organization (SLTMO) has also identified several needs and is also considering improvements to the following:

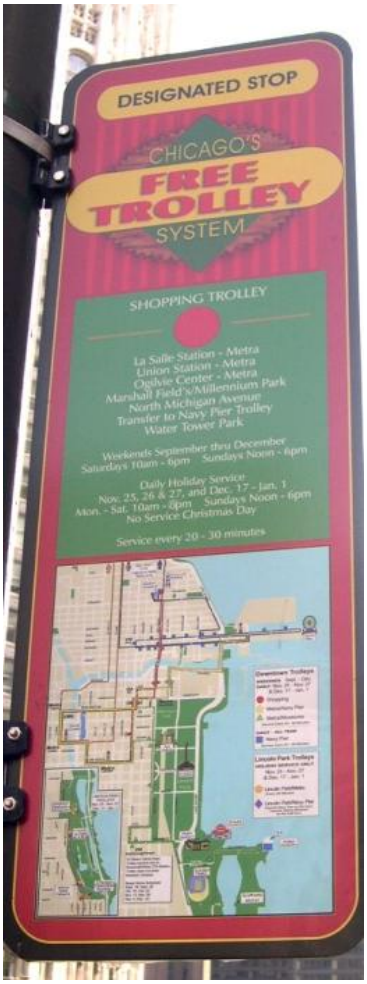
- Bus stop signage and amenities (benches, shelters, system maps)
- Update to the existing LINKS website (and system wayfinding, maps and rider information)
- Passenger real-time arrival information

The SLTMO is awaiting completion of this study and any potential route recommendations before moving forward on capital improvements. Given that the SLTMO may already be investigating several of these items, this chapter will briefly discuss potential considerations.

Bus Stop Signage and Amenities

Given that the LINKS Shuttle may have operational changes in the future, bus stop installation and improvements will likely be necessary. Presently, LINKS relies on a combination of LINKS sign posts and AC Transit bus stops (some in use and others abandoned). As a means to ensure a consistent message to passengers and to reduce confusion, bus stops should all reflect a consistent brand and communicate information in a clear manner. Bus stop signage should include schedule information or point to a phone number or website where this information can be accessed easily. Figure 14 presents several examples of bus stop signage from free shuttle services in Atlanta, Chicago, Emeryville, and Oakland. In many locations where shuttles share bus stops with existing transit, signs can either be placed next to one other or integrated into a combined sign (MARTA/Atlantic Station).

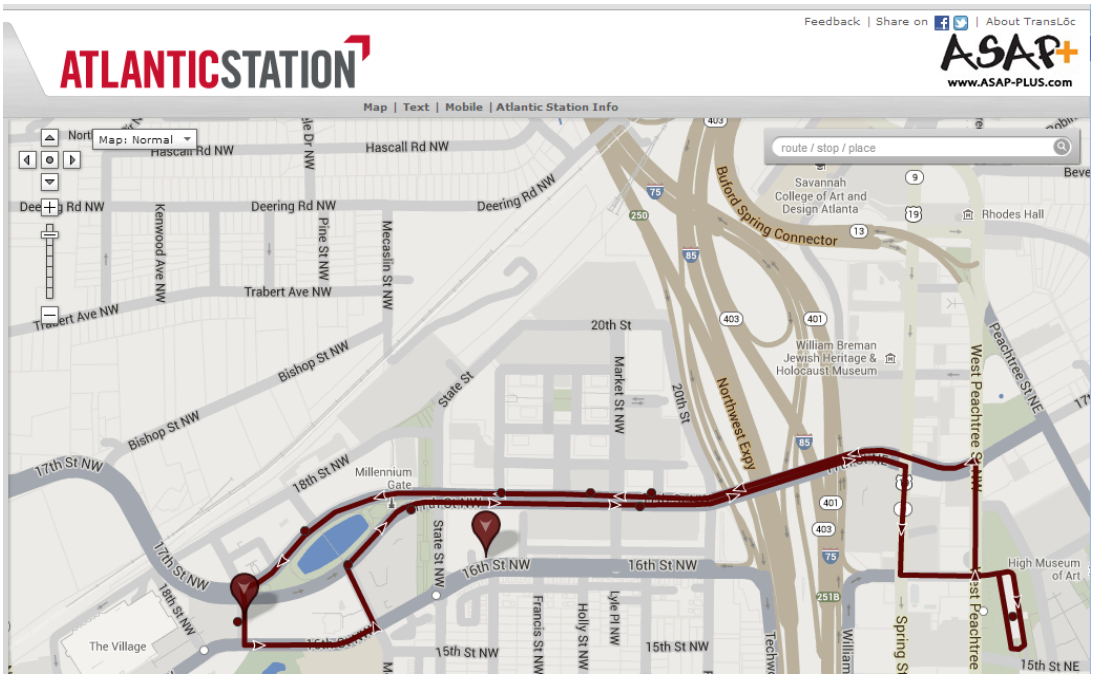
Figure 14 Examples Shuttle Bus Stop Signage



Update the Existing LINKS Website

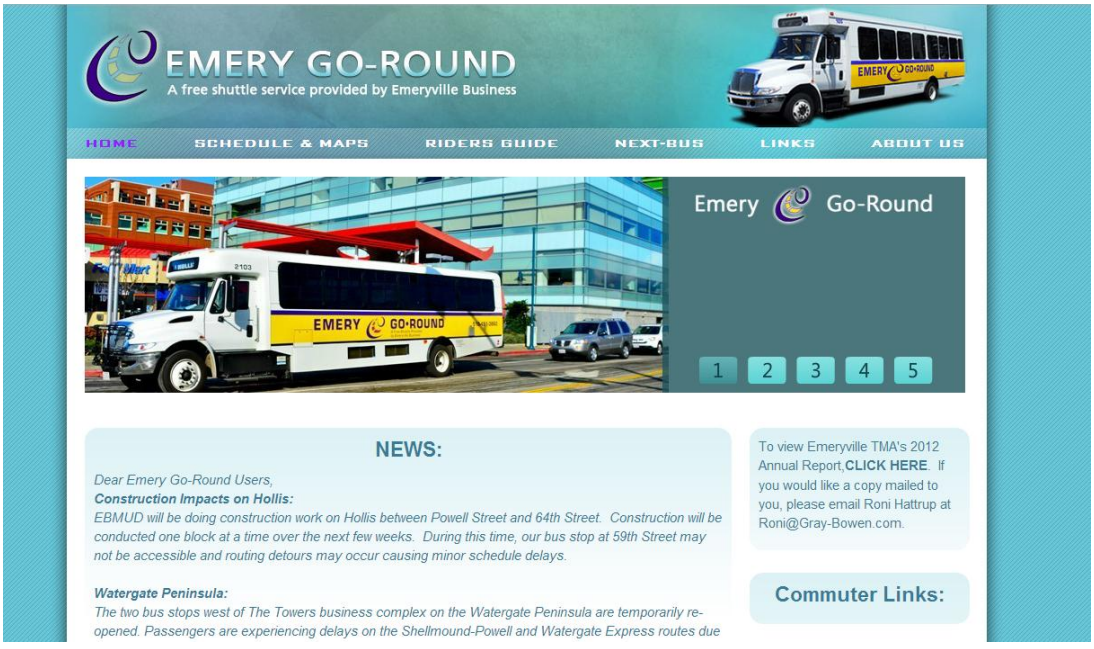
Currently, a minority of LINKS riders report they initially found out about the service through the internet. However, this does not indicate that an internet presence is not important. The internet is currently the place where the most up-to-date information can often be communicated to the largest audience quickly and efficiently. The current LINKS website provides shuttle information in a very clear format on the homepage. Yet, if future routing changes are considered, the website would require redesign to communicate these changes and to convey the new schedule and routing information. This webpage should be easily readable on both a computer screen and on a smartphone (mobile-friendly). The following screenshots are examples of other websites geared toward free shuttle services similar to the LINKS Shuttle.

Figure 15 Atlantic Station Shuttle (Atlanta) Homepage



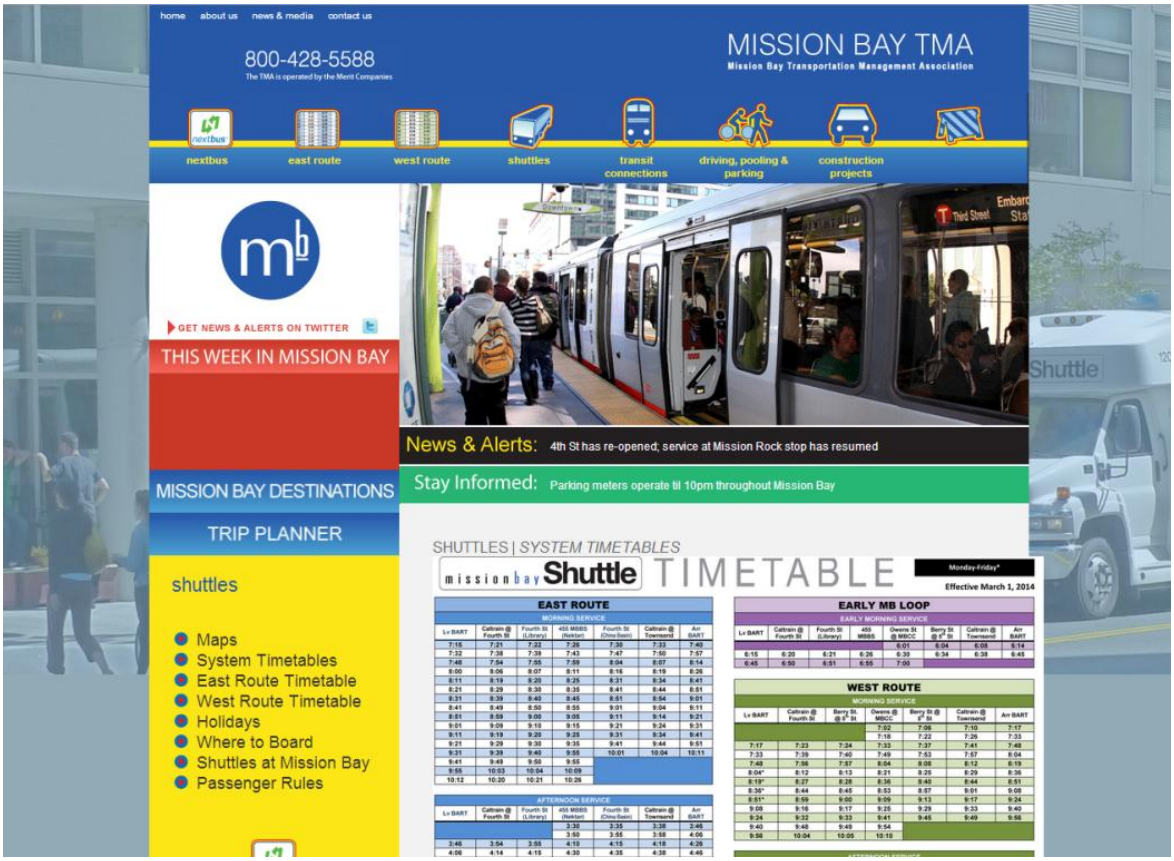
The Atlantic Station Shuttle is a free loop between Atlantic Station and the Atlanta MARTA Station. The homepage directs users straight to an online dynamic map that shows the location of the shuttle relative to each of the stops. While this does not provide users immediate schedule or "how to ride" information, it does provide an instantaneous sense of where the shuttle is in the route and its approximate arrival.

Figure 16 Emery Go-Round Homepage



The Emery Go-Round Homepage provides general information about the service with links to pertinent information such as schedules, maps and rider information.

Figure 17 Mission Bay Shuttle (San Francisco) Homepage



The Mission Bay TMA operates two free shuttles (East and West Loop) between BART and Mission Bay in San Francisco. Its homepage brings people directly to schuttle schedules with maps and other information located as links.

Real-time Arrival Information

As a last-mile shuttle circulator for BART and AC Transit, we must presume that many riders will require a transfer to use the LINKS service. The time associated with a transfer to LINKS plays a major role in whether or not a transit trip is attractive and viable. Given that the service is free, the transfer time and route time are the most important factors in providing an attractive service for potential users. While service resources limit the frequency of service, transit research has shown that real-time arrival information has helped reduce the negative impact of waiting for a transfer. Thus, by providing the estimated wait times, individuals are more likely to find the service convenient. In the past several years, numerous companies have focused on providing real-time arrival information via smartphone using on-board automatic vehicle location (AVL) software.

There are several vendors currently providing this service for large and small transit systems, including:

- Next Bus (California)
- Transloc (North Carolina)
- Doublemap (Indiana)
- Syncromatics (California)

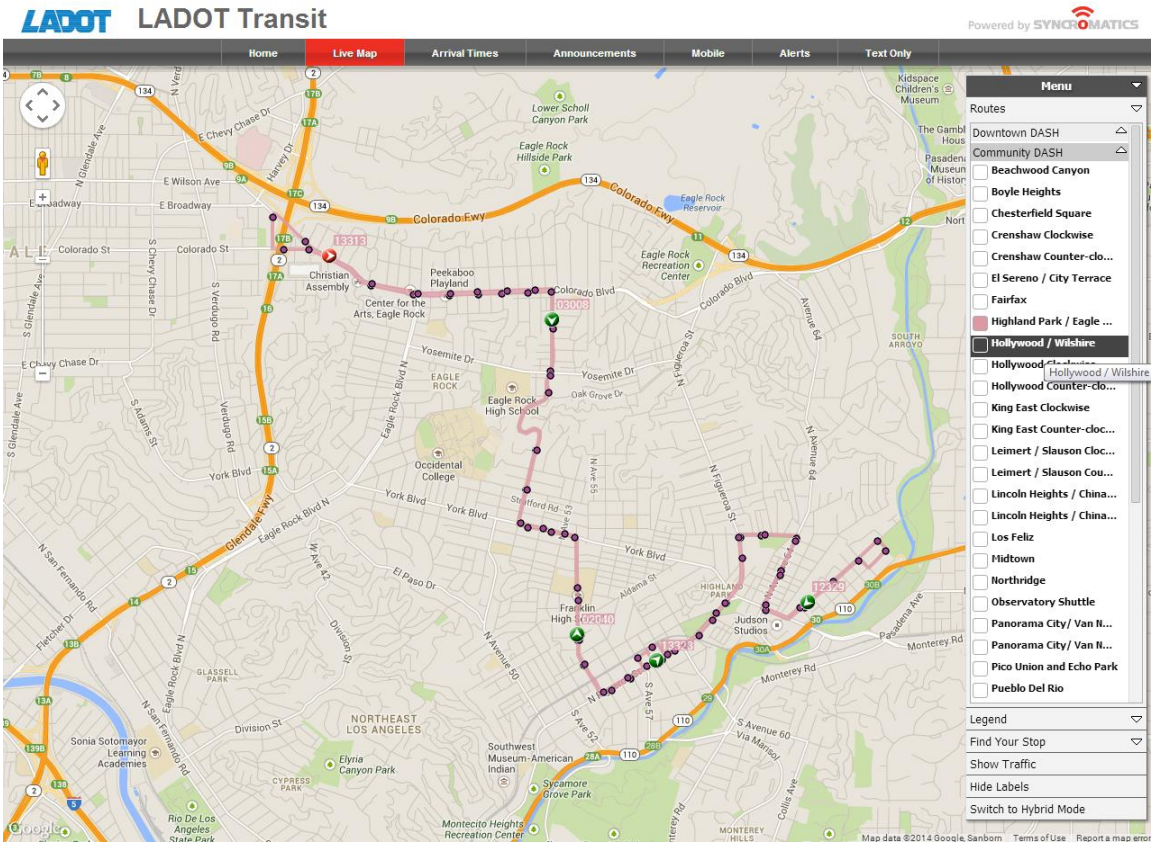
This report does not make any specific recommendations on these vendors as they may provide different benefits and drawbacks for systems like the LINKS Shuttle. Implementation costs can vary between vendors due to the specific technologies being used and the business models. However, based on our work with previous clients, we have found that costs for implementation typically are based on the following elements:

- Number of vehicles
- Number of routes
- Ongoing "subscription" cost to maintain web/operational infrastructure
- Costs of any capital equipment (dynamic signage or similar)

Based on a recent estimate, implementation fixed costs for the LINKS Shuttle might be in the range of $2,500 per vehicle plus $2,000 per route. Again, these costs may vary based on the selected LINKS service model. In addition, an ongoing operational fee would be incurred in the range of $50-$100 per month.

If real-time passenger information is a priority, it is strongly recommended that route alignment decisions be finalized before moving forward on implementing or installing this type of technology.

Figure 18 Web-based Real-Time Arrival Information (Syncromatics)



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4 IMPLEMENTATION PLAN

Given the relatively small size of the LINKS Shuttle program, implementation could occur relatively quickly. Key next steps include:

- Finalizing shuttle routing (alignment and stops)
- Modifying existing contractual agreement with service provider to reflect expanded service and additional vehicles
- Implementing any passenger amenity improvements (real time rider information, map and wayfinding enhancements)
- Developing awareness around future shuttle changes

Based on the service recommendation outlined in Chapter 2, this chapter focuses on immediate next steps and the parties responsible for implementation of the proposed recommendation. The tasks described focus specifically on the North/South Route (4 vehicle) implementation.

Figure 19 San Leandro LINKS Shuttle – Implementation Plan for Service Recommendations

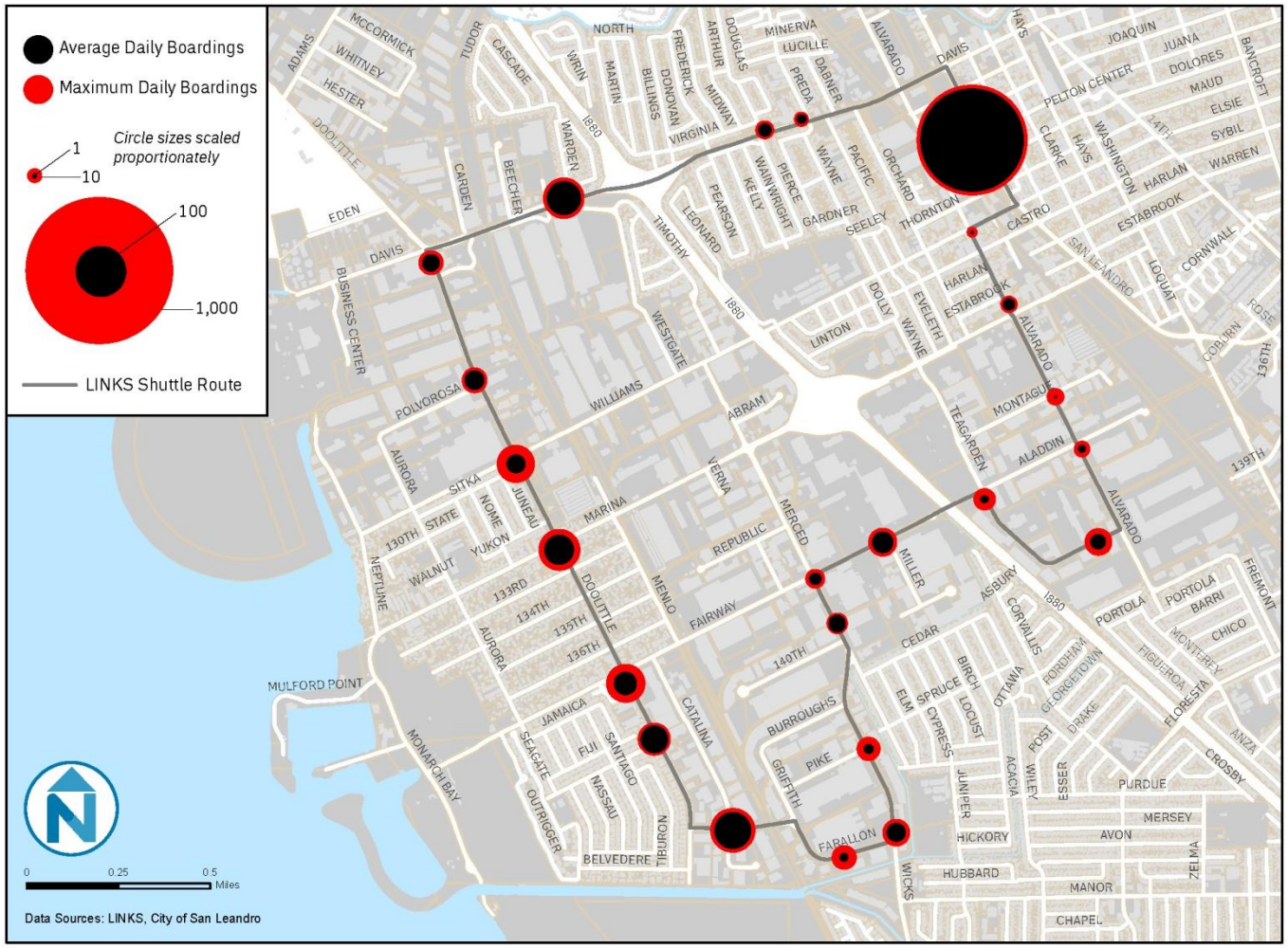
Plan developed for implementation of North/South Routes (4 vehicles) Alternative		
Task	**Involved Parties**	**Timeframe**
Identify Funding: The proposed recommendation includes an increase of operational costs of approximately $253,100[15]. Additional funding will be needed to implement this and subsequent recommendations. Funding may come from a combination of additional funding from the SLTMO, grant funding and contributions from other organizations such as AC Transit. Without proper funding, the subsequent implementation tasks will not be possible.	▪ SLTMO ▪ AC Transit ▪ City of San Leandro	Six months prior to operations
Investigate Passenger Real-Time Arrival Information: If the LINKS Shuttle is interested in integrating real-time arrival information as part of its service offerings, it should consider investigating vendors at least six months prior to launching of new services. This lead time will allow screening of vendors, equipment installation, testing, and integration of real-time information onto the LINKS website and other media.	▪ SLTMO	Six months prior to operations (if pursued)
Test and refine routes as necessary with transportation vendor: Although the recommended routes have been driven by consultant and MV Transportation staff, it is recommended they be tested in real time (peak periods) with the transportation vendor to refine running times and to evaluate the route for safe operation.	▪ SLTMO ▪ Transportation Vendor	Five months prior to operations
Update Vendor Contract: Based on any refinements, the vendor contract must be updated to reflect the new operational requirements and use of additional vehicles. Clauses should be included to provide potential expansion scenarios and future coordination with the Kaiser LINKS Shuttle.	▪ SLTMO ▪ Transportation Vendor	Four months prior to operations
Bus Stop Assessment: Evaluate existing bus stops and identify stops that require improvements. Decide where new bus stops should be located for new segments of shuttle route. (**any assessments related to bus stop amenities would be part of this task).**[16]	▪ SLTMO ▪ AC Transit ▪ City of San Leandro	Four months prior to operations
Install and Update Bus Stops: Based on assessment, installation and updating of existing bus stops should be completed before operation. Costs associated with bus stop improvements may vary depending on level of street improvement needed and if improvement costs would be shared with AC Transit.	▪ SLTMO ▪ AC Transit ▪ City of San Leandro	Two months prior to operations
Marketing Campaign: In advance of major service changes, a marketing campaign should be implemented to leverage full use of the new service by tenants. This campaign should work closely with SLTMO employers to ensure all employees are aware and familiar with the new service (**any necessary website changes would be included as part of this task).** If website changes are planned, this task should begin at least three months prior to website launch to allow for website design and testing.	▪ SLTMO ▪ SLTMO member organizations	One month prior to operations
Begin Operations	▪ SLTMO	-
Preliminary 3-Month and 6-Month Evaluation: After service initiation, services should be reviewed at the three and six month marks to quickly identify any potential service problems or minor modifications that should be made.	▪ SLTMO	Three and six months after operations begin
100% Ridecheck: While ridership data is currently being collected on a daily basis, a 100% ridecheck should be conducted to understand ridership by trip, time-of-day and by stop. This information will help determine whether service span modifications are necessary.	▪ SLTMO ▪ Transportation Vendor	Twelve months after operations begin

[15] Operating costs based on cost per service hour of $53.65.

[16] Segments on the proposed shuttle route alignments that currently have no bus stop infrastructure include:
South Route: (1) Streets along the South Route alignment between Aladdin/Alvarado and Aladdin/Fairway. (2) Streets along the South Route alignment between Farallon\Griffith to Marina\Merced.

APPENDIX A: RIDERSHIP INFORMATION (2013)

The following figure reflects LINKS average and maximum daily ridership per stop based on the 2013 calendar year.



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APPENDIX B: CONSOLIDATED SERVICE OPTIONS WITH KAISER

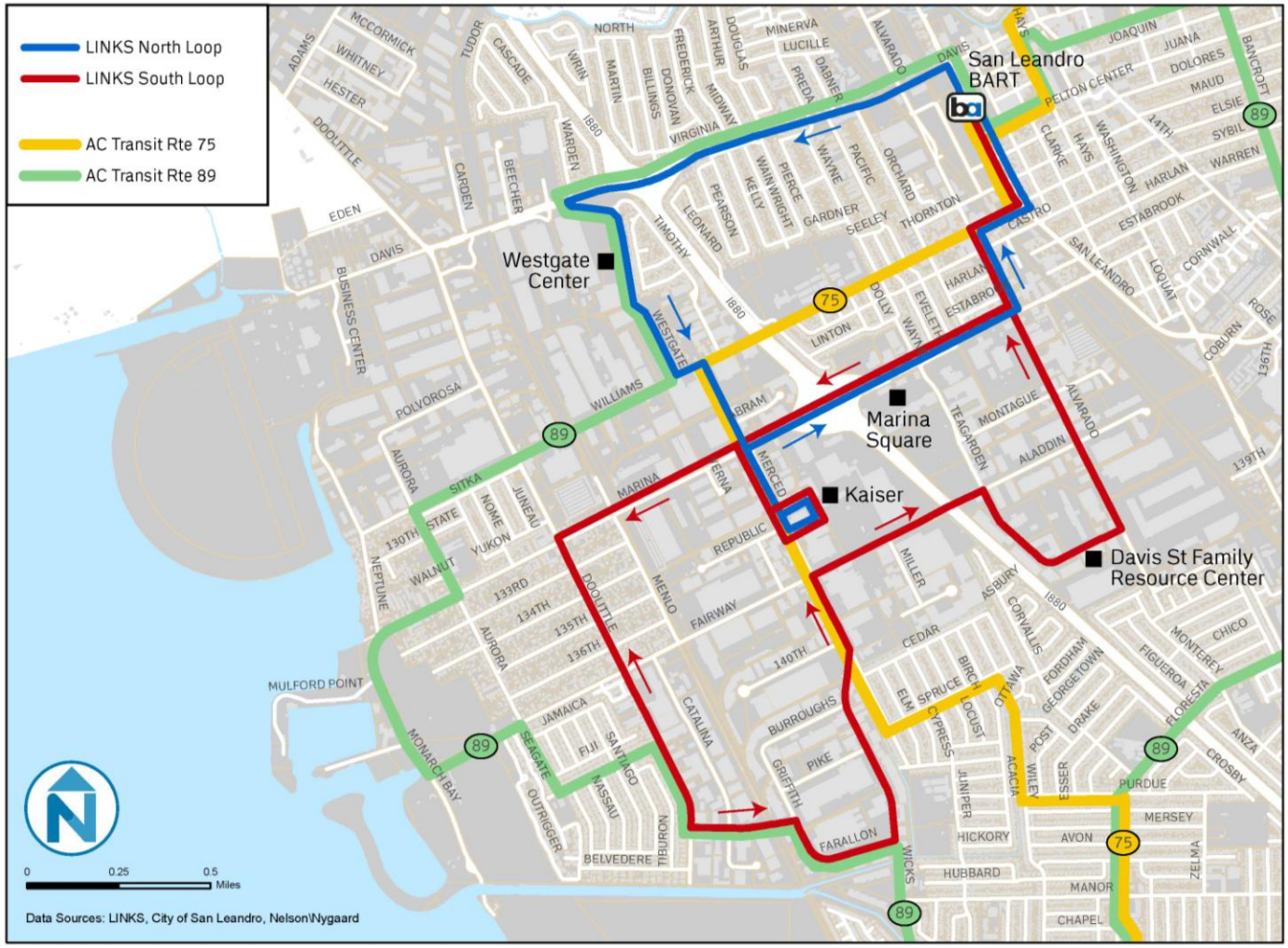
Presently, integrated LINKS Shuttle and Kaiser Shuttle services are not under consideration. However, a joint service proposal was analyzed on a conceptual level that does not have any operational cost information.

Integrated North/South Routes

Route Description

The Integrated North/South Routes alternative would include a North Loop and South Loop with a goal of providing high levels of service to the major transit destinations within the service area including Westgate Center, Kaiser, Marina Square, and future sites identified for future development. This routing alternative includes the previously discussed variation that eliminates service on portions of Davis Street and Doolittle Drive. The shorter length of the North Loop enables shorter ride times and higher frequencies. The alignment as drawn also effectively provides two-directional, direct service between BART and the Kaiser Hospital along Marina Boulevard. Figure 20 presents the Modified Loops routing alternative. Note that all frequencies described in this alternative are estimated as they have not yet been tested with transit vehicles.

Figure 20 Integrated North/South Routes Alignment



Four Vehicles

The Integrated North/South Routes alternative assumes that two vehicles would each service the North and South Loops. These provide frequencies of 15 and 20 minutes, respectively. Riders on the North Loop would experience a shorter round-trip time due to the shortened route. Riders on the South Loop may or may not experience a change in the overall round-trip time. However, in general, this alternative expands the service area and maintains equivalent and/or better service frequency. The characteristics of this alignment are described in Figure 21.

Figure 21 Benefits and Drawbacks of Modified Loop (4 Vehicle) Alternative

	Estimated Frequencies	Vehicle Requirements	Key Destinations
LINKS North Loop	15 minutes	2	Westgate Center, Merced Street, Kaiser, Marina Square, Marina Boulevard.
LINKS South Loop	20 minutes	2	Davis Street Community Center, Kaiser, Farallon, Doolittle, Marina Square
Benefits • Improves frequency and reduces round-trip time to Westgate Center, Kaiser and Marina Square (connected via one route) • Maintains existing service on southern portion of alignment and shortens overall round-trip time • Provides two-way service to Marina Square and Kaiser (along Marina Blvd.)		**Drawbacks** • 15 minute frequencies on South Route may not be sufficient to meet Kaiser service standards (assuming that Kaiser were to contribute to the service) • Four vehicle requirement warrants significant funding increases or contributions from external sources such as AC Transit, Kaiser or others	

Five Vehicles

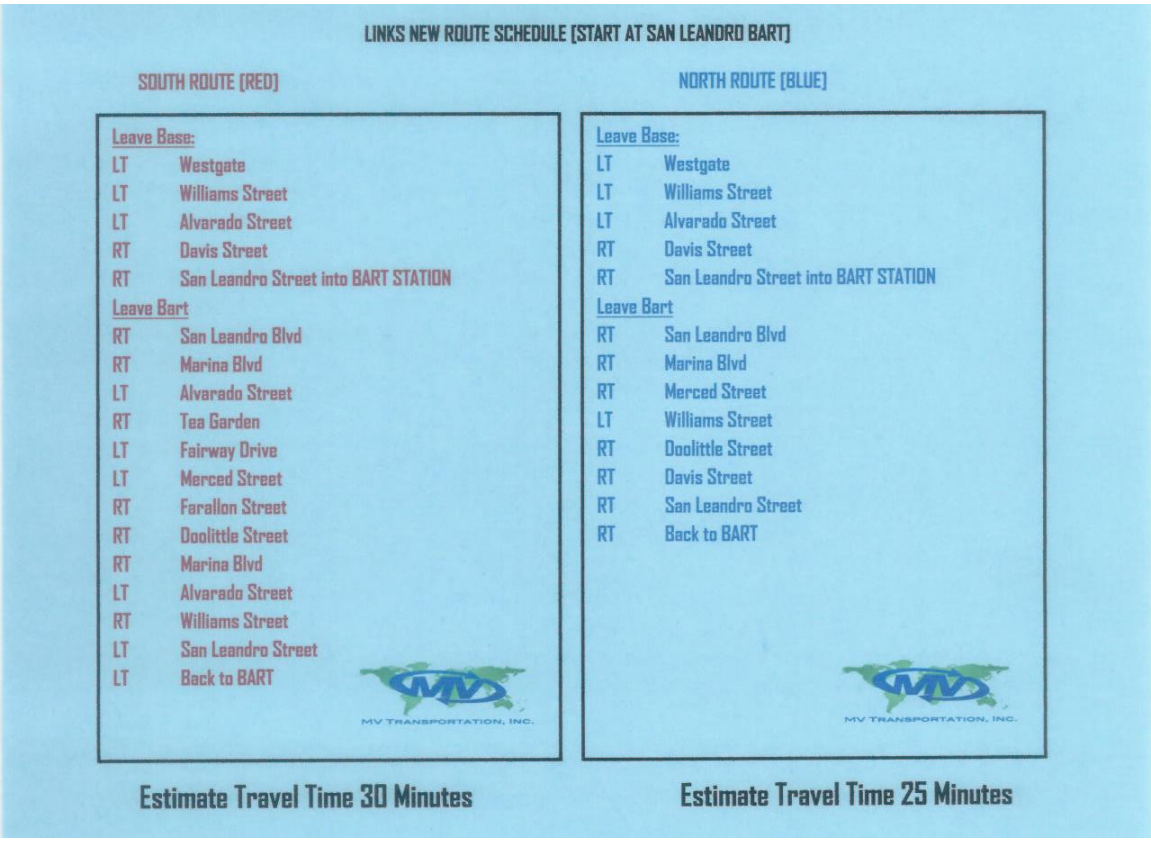
This alternative suggests adding a fifth vehicle to the Modified Loop alternative. The addition of a third vehicle on the North Loop allows 10 minute frequencies on that loop, which also provides 10 minute frequencies (or better – assuming the South Loop also serves the location) to Kaiser. This alternative is presented as Kaiser is currently proposing a dedicated shuttle that provides 10-15 minute frequencies to and from the BART station (utilizing two buses). This alternative can provide an enhanced service frequency while connecting the Kaiser campus with the BART Station and other locations within West San Leandro. Figure 22 presents the service characteristics of this alternative.

Figure 22 Benefits and Drawbacks of Modified Loop (5 Vehicle) Alternative

	Estimated Frequencies	Vehicle Requirements	Key Destinations
LINKS North Loop	10 minutes	3	Westgate Center, Merced Street, Kaiser, Marina Square, Marina Boulevard.
LINKS South Loop	20 minutes	2	Davis Street Community Center, Kaiser, Farallon, Doolittle, Marina Square
Benefits • Very good frequencies (10 minutes) on trips to Westgate Center, Merced, Kaiser, Marina Square • Maintains existing service on southern portion of alignment and shortens overall round-trip time		**Drawbacks** • Five vehicle requirement either warrants major funding increases or contributions from external sources such as AC Transit, Kaiser or others	

APPENDIX C: NORTH AND SOUTH LOOP RUN TIME ESTIMATES

The following run time estimates were conducted by MV Transportation in June 2014.



LINKS NEW ROUTE SCHEDULE [START AT SAN LEANDRO BART]

SOUTH ROUTE [RED]

Leave Base:
LT Westgate
LT Williams Street
LT Alvarado Street
RT Davis Street
RT San Leandro Street into BART STATION
Leave Bart
RT San Leandro Blvd
RT Marina Blvd
LT Alvarado Street
RT Tea Garden
LT Fairway Drive
LT Merced Street
RT Farallon Street
RT Doolittle Street
RT Marina Blvd
LT Alvarado Street
RT Williams Street
LT San Leandro Street
LT Back to BART

MV TRANSPORTATION, INC.

Estimate Travel Time 30 Minutes

NORTH ROUTE [BLUE]

Leave Base:
LT Westgate
LT Williams Street
LT Alvarado Street
RT Davis Street
RT San Leandro Street into BART STATION
Leave Bart
RT San Leandro Blvd
RT Marina Blvd
RT Merced Street
LT Williams Street
RT Doolittle Street
RT Davis Street
RT San Leandro Street
RT Back to BART

MV TRANSPORTATION, INC.

Estimate Travel Time 25 Minutes