Lake County
Transit Development Plan - 2022 Update

Technical Memorandum 3 - Alternatives Analysis

Prepared for the

Lake Area Planning Council

LAKE AREA PLANNING COUNCIL

February 2, 2023

Prepared by LSC Transportation Consultants, Inc.

Lake County
Transit Development Plan
2022 Update

Technical Memorandum 3: Alternatives Analysis

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INTRODUCTION

There are a wide variety of public transit services available to Lake County residents. The Lake Transit Authority (LTA) offers both fixed route and demand response options that provide local, intercommunity, and intercounty service. Medi-Links provides Non-Emergency Medical Transportation (NEMT) services to all Lake County residents who qualify. LSC Transportation Consultants, Inc., has been retained by the Lake Area Planning Council (Lake APC) to prepare an update to the Transit Development Plan (TDP) for both Lake Transit and Medi-Links.

This Technical Memorandum (Tech Memo) is an interim study document that presents a variety of options and alternatives which are aimed at improving mobility for residents and/or efficiency of the local transit system. The memo outlines service, capital, and financial alternatives for Lake Transit and Medi-Links, and then assesses the relative performance of these alternatives within the context of the newly recommended performance goals and standards described in Tech Memo 1. The alternatives discussed in this document were developed based on the findings discussed in Tech Memos 1 and 2 related to Lake County's demographics, LTA and Medi-Links operations data, and public input. Both staff and the public will have the chance to comment on the alternatives presented in this Tech Memo, after which the preferred alternatives will be selected and developed into a recommended five-year service, capital, and financial plan.

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Chapter 2

SERVICE ALTERNATIVES

INTRODUCTION

This chapter presents potential transit service changes for Lake Transit and Medi-Links over the next five years.

LAKE TRANSIT BASE CASE SCENARIO FY 2023-24

The Fiscal Year (FY) 2021-22 LTA cost model, shown in Tech Memo 1, was updated to project costs for status quo LTA service levels in FY 2023-24. The growth of the Consumer Price Index (CPI) between January 2021 and January 2022 of 7 percent was used to predict inflation in the upcoming year. Status quo service levels represent service provided as of September 2022, which includes partial Saturday service and represents a 7 percent increase over FY 2021-22 service levels. The hourly and fixed monthly rate from the latest Paratransit Services contract (FY 2022-23) was also increased 7 percent for inflation to estimate FY 2023-24 operating contract costs. FY 2021-22 non-contractor fixed costs and the FY 2021-22 cost per mile factor (which only represents fuel costs) were both also factored up by 7 percent annually per the CPI. These changes result in the following model:

FY 2023-24 Operating Cost Model = $41.00 x annual vehicle service hours +
$0.67 x annual vehicle service miles +
$1,398,740 in annual fixed costs

Applying the FY 2023-24 cost model to current service levels results in the "Total Status Quo" value seen in Table 1. The "Total Status Quo" value includes both marginal and fixed costs. Ridership estimates for FY 2023-24 are based on average monthly ridership during the first quarter of FY 2022-23, multiplied by 12 to estimate annual ridership figures.

Considering revenues, in FY 2022/23 there is a $5 million operating budget which is more than enough for the $3.4 million in operating costs assumed for the status quo scenario. However, roughly $1.9 million of these revenues are COVID-related temporary funding sources. Therefore, this alternative analysis takes into consideration that significant increases in transit service levels are not likely financially feasible over the short-term without additional discretionary funding sources such as FTA 5311f (Intercity Bus Program services).

Table 1: Lake Transit Service Alternatives
FY 2023-24

Services		Annual Operating Days	Annual Vehicle Service.. Miles	Annual Vehicle Service.. Hours	Annual Operating Cost	Ridership Impact (One-Way Trips) Daily	Ridership Impact (One-Way Trips) Annual	Annual Farebox Revenue	Annual Subsidy Required
Status Quo									
	Operating Costs	304	803,683	37,398	$2,015,541	732	196,364	$391,975	$1,623,566
	Fixed Costs				$1,398,740				
	Total Status Quo	**304**	**803,683**	**37,398**	**$3,414,282**	**732**	**196,364**	**$391,975**	**$1,623,566**
Alternatives									
Route 1	Add 1 bus to add 4 RT on weekdays	252	72,300	3,000	$171,700	31	7,800	$15,600	$156,100
Route 2	Reduce Service to 3 days per week	104	-13,100	-510	-$29,700	-4	-600	-$1,200	-$28,500
Route 2	Eliminate Route 2	252	-36,000	-1,800	-$98,000	-8	-2,100	-$4,200	-$93,800
Route 4a	Reduce Service to 3 days per week	104	-16,380	-562	-$34,100	-4	-400	-$880	-$33,220
Route 4a	Eliminate First Daily Roundtrip (9:16 AM)	252	-9,198	-328	-$19,600	-1	-250	-$600	-$19,000
Route 4a	Eliminate Route 4 a	252	-36,000	-1,380	-$80,800	-6	-1,560	-$3,400	-$77,400
Route 4	Serve Konocti Vista Casino	252	4,435	0	$3,000	0.4	110	$200	$2,800
Route 4	Serve Riviera Shopping Center	252	6,854	0	$4,600	0.4	110	$200	$4,400
Route 8	*Existing Route 8*	*252*	*86,310*	*6,174*	*$311,300*	*106*	*26,714*	$50,000	$261,300
	Microtransit	*252*	*113,117*	*4,788*	*$272,500*	*107*	*27,000*	*$50,500*	*$228,000*
	Subtotal Replace Route 8 with Microtransit		**26,807**	**-1,386**	**-$38,800**	**1**	**286**	**$500**	**-$33,300**
Route 7	Route 7 - Eliminate Final Daily Roundtrip (5:00 PM)	252	-22,277	-725	-$44,700	-0.5	-130	-$330	-$44,370
	Route 7 - Add Earlier Roundtrip (6:30 AM)	252	22,277	725	$44,700	1.0	250	$630	$44,070
	Changes to Route 4	252	14,112	504	$30,200	-1.0	-252	-$640	$30,840
	Subtotal Changes to Weekday Service to Ukiah	**252**	**14,112**	**504**	**$30,200**	**-0.5**	**-130**	**-$340**	**$30,540**
South Clear Lake On-Demand with no Route 4a		156	-9,300	-180	-$13,600	7	1,110	-$700	-$6,900
South Clear Lake On-Demand with no Route 4a and Route 2		156	-45,300	-1,980	-$111,600	-6	-993	-$4,900	-$100,700
Route 12	Shift Route 12 schedule by 30 minutes	252	0	0	$0	4	1,080	$1,450	-$1,450
Lifeline Service to Spring Valley		52	3,224	208	$10,700	2	120	$240	$10,460
Sunday Service									
	Fixed Route Service (Rt 1, 4, 8, 10, 11) at Existing Saturday Levels	52	41,257	2,319	$122,900	114	5,940	$11,900	$111,000
	Microtransit in Clearlake 9 AM to 3 PM	52	27,456	312	$31,300	12	600	$1,000	$30,300
Intercity Service to Santa Rosa									
	Extend Rt 7 1 Round Trip per Day	252	30,240	756	$51,400	1	230	$800	$50,600
	Extend Rt 3 1 Round Trip per Day	252	13,608	504	$29,800	3	630	$2,100	$27,700
Planned Additional Saturday Service									
	Route 3 - 2 RT	52	9,318	312	$19,100	9	460	$1,400	$17,700
	Route 7 - 2RT	52	9,194	299	$18,400	17	880	$2,200	$16,200

LAKE TRANSIT SERVICE ALTERNATIVES

The following section describes potential service alternatives for LTA. Estimates of the service levels, ridership, and operating costs generated by each alternative are presented as changes to the status quo. This information is also shown in Table 1.

Route 1

Increase Frequency

Route 1 is one of the most popular LTA services. This route served over 35,000 passenger-trips in FY 2021-22 and is projected to serve over 40,000 passenger-trips in the FY 2023-24 "Status Quo" scenario. In addition to weekend service, the most popular ideas for improving Lake Transit service according to the on-board survey are expanding service hours and increasing service frequency. As Route 1 experiences high ridership, one of the service alternatives considered was increasing the service frequency.

One round trip on Route 1 takes around 3 hours, including layover time. Currently, three buses provide roughly hourly service with a break for lunch during the middle of the day. (The first westbound run is interlined with Route 8 using a separate bus). If a fourth bus is added to Route 1 beginning at 7:30 AM and operating continuously (without a break in the schedule) until 7:20 PM, an additional four round trips could be provided. An example schedule is shown in Table 2, showing that half-hourly service would be provided in some periods. This would require operating one additional bus, 2,700 vehicles hours and 72,300 vehicle miles annually. This would cost on the order of $171,700 annually and bring in an additional $15,600 in fare revenue. An elasticity analysis was conducted to estimate additional ridership from the added 4 round trips per day. Elasticity is the measurement of the percentage change of one economic variable in response to a change in another. Various studies provide insight as to the percentage change in ridership observed at other transit agencies after increasing or decreasing service levels. According to the analysis, an additional 7,800 one-way trips would be generated. This equates to an annual operating subsidy of $156,100.

Route 2

Operate Route 2 Three Days per Week

Route 2 provides service to the rural communities of Cobb, Whispering Pines, and Loch Lomond along the State Route (SR) 175 corridor in the southwestern region of Lake County, with timed connections to other Lake Transit Routes in Middleton and Kits Corner. Route 2 service has been suspended or reduced multiple times in the past few years either due to the pandemic or staffing shortages. Route 2 ridership has never been very robust compared to other services due to the relatively small population living along the route, but ridership has dropped even further since the Valley Fire destroyed nearly 2,000 homes along the route in 2015, then the frequent service changes, and then the external factors influencing transit in the 2020s. In FY 2021-22, Route 2 carried less than one passenger-trip per vehicle hour and required a high operating subsidy per passenger-trip of $125.07. Currently Route 2 operates three round trips per day five days per week.

It is not uncommon for rural transit agencies to offer "lifeline" transit service to communities which are located a long distance from the main commercial centers in the county. Lifeline transit service could be offered anywhere from 1 – 3 days per week as a way to provide transportation for critical

trips such as to medical appointments, social service appointments and for groceries. Lifeline transit service is designed for those who do not have other means of transportation.

TABLE 2: Route 1 Example Schedule - Four Buses

Westbound

Walmart	Clearlake Oaks	Glenhaven	Lucerne	Nice PO	Robinson Rancheria	Upper Lake	County Jail	Hospital
6:00 AM	6:13 AM	6:23 AM	6:43 AM	6:47 AM	6:55 AM	7:04 AM	7:12 AM	7:16 AM
7:00 AM	7:13 AM	7:23 AM	7:43 AM	7:47 AM	7:55 AM	8:04 AM	8:12 AM	8:16 AM
7:30 AM	7:43 AM	7:53 AM	8:13 AM	8:17 AM	8:25 AM	8:34 AM	8:42 AM	8:46 AM
8:00 AM	8:13 AM	8:23 AM	8:43 AM	8:47 AM	8:55 AM	9:04 AM	9:12 AM	9:16 AM
9:00 AM	9:13 AM	9:23 AM	9:43 AM	9:47 AM	9:55 AM	10:04 AM	10:12 AM	10:16 AM
10:00 AM	10:13 AM	10:23 AM	10:43 AM	10:47 AM	10:55 AM	11:04 AM	11:12 AM	11:16 AM
10:30 AM	10:43 AM	10:53 AM	11:13 AM	11:17 AM	11:25 AM	11:34 AM	11:42 AM	11:46 AM
11:00 AM	11:13 AM	11:23 AM	11:43 AM	11:47 AM	11:55 AM	12:04 PM	12:12 PM	12:16 PM
12:00 PM	12:13 PM	12:23 PM	12:43 PM	12:47 PM	12:55 PM	1:04 PM	1:12 PM	1:16 PM
1:30 PM	1:43 PM	1:53 PM	2:13 PM	2:17 PM	2:25 PM	2:34 PM	2:42 PM	2:46 PM
2:00 PM	2:13 PM	2:23 PM	2:43 PM	2:47 PM	2:55 PM	3:04 PM	3:12 PM	3:16 PM
3:00 PM	3:13 PM	3:23 PM	3:43 PM	3:47 PM	3:55 PM	4:04 PM	4:12 PM	4:16 PM
4:00 PM	4:13 PM	4:23 PM	4:43 PM	4:47 PM	4:55 PM	5:04 PM	5:12 PM	5:16 PM
4:30 PM	4:43 PM	4:53 PM	5:13 PM	5:17 PM	5:25 PM	5:34 PM	5:42 PM	5:46 PM
5:00 PM	5:13 PM	5:23 PM	5:43 PM	5:47 PM	5:55 PM	6:04 PM	6:12 PM	6:16 PM
6:00 PM	6:13 PM	6:23 PM	6:43 PM	6:47 PM	6:55 PM	7:04 PM	--	7:16 PM

Eastbound

Hospital	Upperlake	Robinson Rancheria	Nice PO	Lucerne	Glenhaven	Clearlake Oaks	Woodland Colege	Walmart
6:35 AM	6:50 AM	6:59 AM	7:09 AM	7:13 AM	7:28 AM	7:37 AM	7:50 AM	7:55 AM
8:30 AM	8:45 AM	8:54 AM	9:04 AM	9:08 AM	9:23 AM	9:32 AM	9:45 AM	9:50 AM
9:00 AM	9:15 AM	9:24 AM	9:34 AM	9:38 AM	9:53 AM	10:02 AM	10:15 AM	10:20 AM
9:30 AM	9:45 AM	9:54 AM	10:04 AM	10:08 AM	10:23 AM	10:32 AM	10:45 AM	10:50 AM
10:30 AM	10:45 AM	10:54 AM	11:04 AM	11:08 AM	11:23 AM	11:32 AM	11:45 AM	11:50 AM
11:30 AM	11:45 AM	11:54 AM	12:04 PM	12:08 PM	12:23 PM	12:32 PM	12:45 PM	12:50 PM
12:00 PM	12:15 PM	12:24 PM	12:34 PM	12:38 PM	12:53 PM	1:02 PM	1:15 PM	1:20 PM
12:30 PM	12:45 PM	12:54 PM	1:04 PM	1:08 PM	1:23 PM	1:32 PM	1:45 PM	1:50 PM
1:30 PM	1:45 PM	1:54 PM	2:04 PM	2:08 PM	2:23 PM	2:32 PM	2:45 PM	2:50 PM
3:00 PM	3:15 PM	3:24 PM	3:34 PM	3:38 PM	3:53 PM	4:02 PM	4:15 PM	4:20 PM
3:30 PM	3:45 PM	3:54 PM	4:04 PM	4:08 PM	4:23 PM	4:32 PM	4:45 PM	4:50 PM
4:30 PM	4:45 PM	4:54 PM	5:04 PM	5:08 PM	5:23 PM	5:32 PM	5:45 PM	5:50 PM
5:30 PM	5:45 PM	5:54 PM	6:04 PM	6:08 PM	6:23 PM	6:32 PM	6:45 PM	6:50 PM
6:00 PM	6:15 PM	6:24 PM	6:34 PM	6:38 PM	6:53 PM	7:02 PM	7:15 PM	7:20 PM
6:30 PM	6:45 PM	6:54 PM	7:04 PM	7:08 PM	7:23 PM	7:32 PM	7:45 PM	7:50 PM
8:20 PM	8:30 PM	8:39 PM	8:49 PM	8:53 PM	9:08 PM	9:17 PM	9:30 PM	9:35 PM

In the interest of cost efficiency, this alternative examines the impacts of reducing Route 2 from five day per week service to three days per week[1]. This alternative would not change the daily schedule; the only change would be the number of days per week Route 2 operates. As seen in Table 1, this service alternative would reduce operating costs by $29,700 in FY 2023-24. According to onboard surveys, two-thirds of Route 2 passengers did not have a vehicle available to them nor did they have a driver's license. None of the Route 2 respondents stated that they were taking the bus to work, indicating that they do not need the service five days a week. Therefore, it is reasonable to assume that most Route 2 passengers would shift their schedules to match the revised schedule. However, there would still be loss in annual ridership because the service will be less convenient; particularly for those without a vehicle available. It is estimated that reducing Route 2 service from five days per week to three days per week would decrease annual ridership by 600 one-way trips. This results in a loss of approximately $1,200 in fare revenues and an annual operating subsidy savings of $28,500. This alternative could also have a small negative impact on ridership for Route 4 and Route 3 as Route 2 passengers transfer to these routes to reach the communities of Clearlake, Lakeport, and Calistoga.

Eliminate Route 2

Given the low ridership on Route 2, it is reasonable to consider eliminating the route to increase overall cost efficiency. It should be noted that monthly ridership has doubled since full Route 2 service was reinstated. However, Route 2 is still one of the lower performing routes. By eliminating Route 2, LTA would save roughly $93,800 in annual operating subsidy. Eliminating this route would leave the residents of Cobb, Loch Lomond and Anderson Springs without transit service. Roughly 2,100 one-way passenger trips would be lost.

Route 3

Connections with Regional Transit Services

Route 3 is an important intercounty service for Lake County residents needing services in Napa County. Route 3 operates four round trips each weekday, two to Calistoga and two to Deer Park. As Route 3 provides connections to intercity transit services such as Greyhound and Amtrak, this route receives Federal Transit Administration (FTA) 5311(f) funding as part of a combined route with Route 1 (referred to as Route 30). Many passengers use Route 3 to transfer to other services; according to the on-board surveys, one-third of respondents transferred to/from Route 1 on the day they rode Route 3. Another 20 percent transferred to Vine Transit in Napa County, as free transfers are available between Route 3 and Napa's VINE Route 10, Calistoga Shuttle, or St. Helena Shuttle. Given the number of possible transfer opportunities between Route 3 and different routes and intercity transit services, it is important to review Route 3 and the timing of these connections to see if greater connectivity could be achieved.

Route 3 passengers can transfer for free to the Calistoga Shuttle, the St. Helena Shuttle, or Route 10 of VINE transit. The Calistoga and St. Helena Shuttles are both on-demand services (the St. Helena

[1] If a holiday falls on a service day, service would still be provided three days in the week by shifting the service day to avoid the holiday.

Shuttle has limited fixed route service on weekdays, primarily to serve local students). The Calistoga Shuttle operates from 7:00 AM to 7:00 PM Monday through Thursday and until 9:00 PM on Friday, so any Lake County resident visiting Calistoga for the day would have the Shuttle available if needed. The St. Helena Shuttle operates from 9:00 AM to 6:00 PM Monday through Thursday and to 7:00 PM on Friday. These hours of operation also mean that anyone from Lake County visiting Deer Park for the day would have the St. Helena Shuttle available. Rides for both services can be booked by phone, through the Ride the Vine App, or online. As both of these services are on-demand, there is no timed transfers that need to be made. Riders just need to be prepared to schedule their on-demand rides.

Route 10 of VINE Transit travels further south into Napa County. Lake County residents traveling to the City of Napa can take the first LTA Route 3 bus to the Lincoln Avenue Bridge stop in Calistoga, and then they would have to wait 40 minutes to board the 8:00 AM VINE Route 10 southbound bus. These passengers would arrive at the Soscol Gateway Transit Center in downtown Napa at 9:18 AM, giving them 3 to 7 hours in Napa before they would have to board the northbound Route 10 bus to transfer back to LTA's Route 3 northbound service to Clearlake. If Lake County residents took the 7:55 AM Route 3 bus to Calistoga, they would alight at the Lincoln Avenue Bridge at 9:00 AM and then transfer to VINE Route 10 at 9:10 AM. This would provide travelers with 1.5 to 5.5 hours in Napa before needing to board the bus back to Calistoga.

It is important to note that Lake Transit passengers who transfer to VINE Route 10 in Calistoga or Deer Park can then later transfer to VINE Route 29 or Amtrak, both of which take passengers further south to the San Francisco Bay Area. However, those trying to travel to San Francisco from Clearlake via LTA and Vine Transit would need to stay overnight in the city.

Napa County residents can visit Lake County for the day by traveling northbound on Route 3 to Clearlake. Travelers would be in Lake County for anywhere from 1 to 8 hours depending on which bus they took and whether they need to get home to Calistoga or Deer Park. If persons traveling from Napa County needed to travel to anywhere in Lake County besides Clearlake, the length of their travel day would nearly double, and it would cut down their available time for out-of-county shopping or medical appointments.

In conclusion, Route 3 passengers are able to use the service to make timed connections with Napa County services, and there are no improved connections identified at this time. Those not making overnight trips have adequate time in Calistoga, Deer Park, or Napa to shop, make medical appointments, etc. before needing to return home. Although taking Route 3 to Napa is a long travel day for Clearlake resident, for residents of Lakeport and other communities along the North and South Shores of Clear Lake, it is much more difficult to make a round trip in one day; residents would only be able to visit the Napa urban area for 1.5 hours and total travel time would be over 8 hours.

There are two opportunities for timed connections between Route 1 and Route 3. As discussed above, these connections allow for time for appointments and shopping but not for standard 8 – 5 work schedules. On-board surveys showed that a greater number of respondents are more likely to use expanded transit services to Santa Rosa/Ukiah than Napa County. LTA service to Santa Rosa is

discussed below. With respect to intercity connections, it is important that LTA keep operating the first daily eastbound Route 1 and Route 4 runs, as passengers on these buses can then transfer to Route 3 and have enough time in Napa County before needing to return to get home.

Route 4a

Operate Route 4a Three Days per Week

Route 4a travels between Kit's Corner, at the intersection of SR 29 and Soda Bay Road, and Lakeport, serving communities along Soda Bay Road, Kelseyville, Big Valley Rancheria and the Konocti Vista Casino. Much like Route 2, Route 4a service has been cut or reduced multiple times in recent years when the transit system was adjusting to the impacts of the pandemic and staffing shortages. These reductions have caused ridership to drop in recent years. While pre-pandemic ridership was low due to the rural nature of the service area, current ridership is still lower; monthly ridership in September 2022 was only 40 percent of levels seen in February 2020, the last month before the pandemic. The latest ridership reports for August and September 2022 show that Route 4a carries around six passenger trips per day and less than 1 trip per vehicle hour.

Given the low ridership, this alternative analyzes reducing Route 4a service to three days a week from five days a week. Like the previously discussed option with Route 2, reducing service to three days a week would not affect the Route 4a daily schedule. Reducing Route 4a service to three days a week would reduce operating costs by over $34,100 (Table 1). With the reduced schedule ridership is anticipated to decrease by about 400 passenger trips with an associated decline of $880 in fare revenues annually.

Eliminate the First Roundtrip of the Day (9:16 AM)

According to available boarding by run data from LTA, very few passengers ride the 9:16 AM Westbound and 10:15 AM Eastbound Route 4a roundtrip. Eliminating the first daily roundtrip would reduce operating costs and would still allow people traveling from the Soda Bay area westbound to Lakeport to spend anywhere from 1 to 5 hours in town before catching the last Route 4a bus to return home.

Eliminating the first daily roundtrip would more negatively impact people traveling eastbound to Clearlake via a transfer to Route 4. Passengers would only have one opportunity to get to Clearlake per day if the first Route 4a roundtrip is eliminated. Once in Clearlake, they would only have 50 minutes after disembarking at the Walmart before they would have to board the Route 4 bus to make their transfer to the final Route 4a westbound bus.

This service alternative and the associated reduction in service levels would result in annual operating costs decreasing by $19,600 (Table 1). Based on ridership by run data collected in March 2022, it is estimated that there would be a likely decrease of about 250 passenger-trips, causing fare revenues to decrease by around $600 per year. As with all Route 4a alternatives, this alternative would have the greatest impact on the residents of Soda Bay and Big Valley Rancheria, as this is the only route serving those communities.

Eliminate Route 4a

Given the low ridership and productivity (less than one passenger-trip per vehicle hour) on Route 4a, it is reasonable to consider eliminating the route completely. Under this option, Konocti Vista Casino/Big Valley Rancheria would still have access to transit service with Route 8. Kelseyville would still be served by Route 4, but Soda Bay, Clear Lake Riviera, and Riviera Estates would no longer be served by a fixed route. Available boarding by stop data shows that these communities generate low ridership. Transit dependent residents in these communities could take advantage of the Lake Links volunteer driver programs.

Eliminating Route 4a would reduce annual operating subsidy by $77,400 and reduce ridership by 1,025 trips annually. As discussed above, Routes 2 and 4a are interlined so it would be difficult to eliminate one route without the other.

Route 7

Connections with Regional Transit Services

Route 7 completes four roundtrips between Lakeport and Ukiah every weekday, providing an important regional transit connection to Mendocino County. This route also receives Federal Transit Administration (FTA) 5311(f) funding as part of a combined route with Route 4 (referred to as Route 40) because passengers are able to connect to other intercity transportation services in Mendocino County. Much like with Route 3 and the combined Route 30, it is important to review Route 7's connections with other transit services and whether or not they are feasible for most travelers.

Passengers can transfer to several Mendocino Transit Authority (MTA) routes at the Pear Tree Center in Ukiah. Passengers on the first Route 7 bus to Ukiah in the morning can transfer to either MTA Route 65 northbound or Route 65 southbound within 10 minutes of arriving at the stop. Route 65 travels northbound to Willits and Fort Bragg and southbound to Santa Rosa. This is important, as according to survey feedback collected during the TDP planning process, Santa Rosa is the top out-of-county destination that Lake County residents need to travel to. Santa Rosa also provides good connections to intercity services, such as passenger air service and SMART rail service. Passengers traveling onward to Santa Rosa would arrive at 10:35 AM and would be able to transfer to the Santa Rosa City Bus. These travelers would have to then board the Route 65 northbound bus 3 hours later to return to Ukiah, but then they would have to stay in Ukiah for an additional 1.5 to 2 hours until the next LTA Route 7 bus back to Clearlake. Although this is a long travel day, Lake County residents are still able to get to Santa Rosa for a few hours and back in one day. Connections to Santa Rosa alternatives are discussed further below.

Eliminate Final Roundtrip of the Day (5:00 PM) and Add Earlier Trip to Ukiah (6:30 AM)

The final daily roundtrip of Route 7 leaves Lakeport at 5:00 PM, arrives in Ukiah at 6:00 PM and departs for Lake County at 7:00 PM. Available boarding and alighting data by run shows that very few passengers use this roundtrip (no boardings were recorded during the time period reviewed). This coincides with staff observations. At the same time there have been requests through social service

agencies to add earlier service to Ukiah. With the current schedule, the earliest a passenger can arrive in Ukiah is 9:00 AM, potentially too late to commute to Ukiah regularly for work. Another option would be to add a Route 7 departure from Lakeport at 6:30 AM which would arrive at the Ukiah airport around 8:00 AM on weekdays. The last departure from Ukiah would be at 5:00 PM, generally allowing for a traditional workday schedule. As Route 7 is interlined with Route 4, this would also require adding one round trip on Route 4, if the 6:45 AM Eastbound Route 4 trip is eliminated (which serves 1.5 average daily boardings).

All these changes would result in an annual operating cost increase of $30,200. Overall ridership for Routes 4 and 7 is anticipated to decrease by a small amount annually (130), resulting in an annual operating subsidy of $30,540. As combined Route 7 and Route 4 service to Ukiah is subsidized by the FTA 5311(f) grant program, it is possible that half of the costs of this alternative could be paid for using FTA 5311(f) funds.

Service Alternatives for the Lakeport Region

Lakeport and the surrounding communities on the southwest side of Clear Lake are served by Route 8, Route 7, Route 4 and Route 4a. The following alternatives present a series of related options to increase ridership and cost efficiency in this area.

Route 8 – Replace with Microtransit

Route 8 provides hourly service using two buses between Sutter Hospital in the northern part of Lakeport, through downtown Lakeport and ending at the Konocti Vista Casino (about 2.5 miles southeast of town) between 7:30 AM and 7:30 PM. The route carries around 3.5 passenger-trips per vehicle hour. When ridership demand is lower than 3 or 4 trips per hour, it is worth reviewing on-demand micro-transit service as an alternative.

Over the last several years, the concept of "microtransit" has seen increasingly widespread application across the nation. The goal of microtransit service is to provide coverage over an area not served efficiently by fixed-route service with a short response time, typically within 15 minutes of the request. Microtransit applies the app-based technology developed for transportation network companies (such as Uber and Lyft) to provide a new form of public transit service in lower demand and lower density areas. While the concept of real-time, demand-response service has been envisioned for many years, it could not be effectively implemented until recently with the advent of new technology. Passengers typically use an app downloaded on their smartphone or computer to request a ride and a routing algorithm (rather than a dispatcher) assigns the ride request to a specific driver/vehicle. The passenger is provided with an estimated service time, and fares are typically handled through the app. In addition, to ensure equitable accommodation, rides may also be requested directly over the phone. However, most trips are assigned without the need for manual dispatching. As microtransit is a shared-ride service, multiple passengers may be on the vehicle at the same time. Requirements of the Americans with Disabilities Act may be met by ensuring that a sufficient number of accessible vehicles are available to serve those who require accessible service.

The benefit of this type of service is that passengers are not limited to certain fixed route stops and therefore passengers are not required to walk far to/from a bus stop. Lakeport already has a Dial-A-Ride service which provides door-to-door transportation within Lakeport with priority for ADA eligible passengers. Dial-A-Ride services typically require 24-advance reservations. This can be seen as a hassle for some passengers in that they must plan the specific time they need a ride in advance.

Under this option, LTA would obtain a license to an online application service and make this app available to passengers for free download. On-demand service can be operated using existing LTA vehicles, drivers and dispatchers. Passengers can use the app on a phone or computer to make a ride request or continue to make phone requests (other areas have found that a majority of riders shift to using the app). Dispatchers will enter the phone ride requests into the app. Standing subscription trips (such as individuals regularly going to a senior meals program, as one example) could be made, avoiding the need for ongoing individual bookings. The application software will dispatch drivers, following algorithms that minimize service costs and enhance response times. This will free up dispatchers to address service issues and work on other tasks. It is not expected that any dispatch positions would be eliminated or reduced. The application software will automatically track ridership patterns, response times and missed trips.

There is a quickly growing list of public transit systems that are implementing microtransit services, including Sacramento RT, Napa VINE, Washoe RTC in Reno/Sparks (Nevada), the Cheyenne Transit Program (Wyoming), the Citibus system in Lubbock (Texas) and Placer County (California). Microtransit has the potential to provide a higher quality demand response service (faster response times), increase the capacity of the system within the existing vehicle-hours of service and to improve the working conditions of LTA staff. The increased convenience of the ride request service could also lead to long-term increases in ridership, and the additional automated data collection could also allow better allocation of resources over time. In addition, the new software program will provide improved reporting capabilities and will allow enhanced management of the service.

There are several companies currently offering such packages (such as Spare Labs, TransLoc, Via, the Routing Company and TripSpark), and it would be appropriate to select a vendor through an RFP process. The cost of obtaining and maintaining the software would be determined through the RFP process and is difficult to specify, but it is estimated that a software license for an On-Demand transit application could cost around $500 per vehicle per month on top of $11,500 in fixed costs.

Although a relatively small community, Lakeport is spread out north to south along the shore of Clear Lake, making travel times from one end to the other be around 15 minutes. If the Konocti Vista Casino is served, travel times would be longer. Boarding by run data shows that fewer boardings occur during the first two hours of service and the last hour of service; therefore, only one microtransit vehicle would be needed during that time (7:30 AM to 9:30 AM and 5:30 PM to 6:30 PM). Two buses would need to be operated from 9:30 AM to 5:30 PM. The service area should include the area east of SR 29 from Sutter Lakeside Hospital to Mendocino College with pickups/drop offs available at the Konocti Vista Casino/Big Valley Rancheria. A response time of 30 minutes could be advertised. A potential Lakeport microtransit service area is shown in Figure 1.

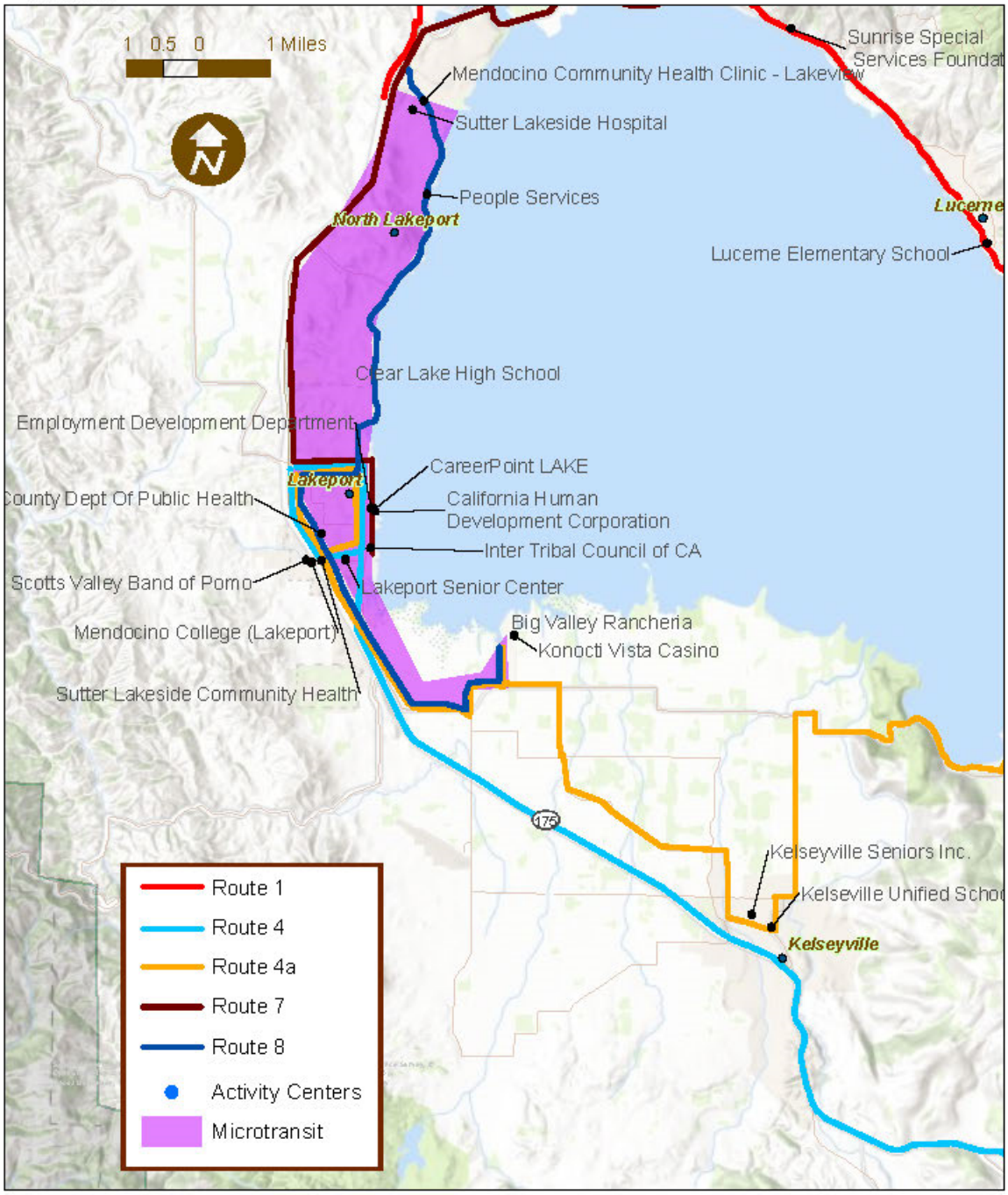
According to available ridership by stop data, the majority of boardings on Route 8 occur between Sutter Hospital and downtown Lakeport. For this reason and in the interest of providing better service in the Lakeport core area, eliminating the Konocti Vista Casino from the microtransit service area was considered. However, roughly 8 percent of average daily boardings on Route 8 occur at the Casino. Combined with the fact that the Casino stop would also serve the Big Valley Rancheria, the Casino is included in the microtransit service area.

Another element to consider as part of this discussion is transfer patterns. The second most common transfer pattern on the day of the on-board survey was between Route 1 and Route 8 at the Sutter Hospital (10 passengers). This could increase productivity of a microtransit service as passengers transferring from Route 1 could be grouped.

It is estimated that replacing Route 8 with microtransit would decrease operating costs by around $38,800 per year. As for ridership demand, one can expect at least a similar level of demand to the current Route 8 ridership which is about 3.5 trips per vehicle hour. Microtransit tends to increase ridership demand over fixed route service if microtransit is able to serve a larger number of neighborhoods more conveniently. In the case of Lakeport, most neighborhoods are within one-half mile of the fixed route. Another factor to consider is consistency. Having a fixed route schedule which can be counted on and doesn't change may be preferrable to a passenger needing to get to work or an appointment. According to surveys, 12 percent of Route 8 passengers were going to/from work. Therefore, it is assumed for this analysis that ridership on a microtransit service would not be significantly greater than existing ridership on Route 8 or roughly 27,000 annually, however as only one van would be used during non-peak hours, there would be some savings in annual operating subsidy. This is a small increase from Route 8 annual ridership figures of 300. After annual operating costs for the app are considered, this equates to an annual operating subsidy of around $16,000 less than existing Route 8.

Another option to consider is to "comingle" microtransit with Lakeport DAR. Currently DAR is carrying 1.3 passenger-trips per hour. This means there are times during the day that the DAR driver has no passengers and would be able to provide microtransit rides. DAR would also be assigned all microtransit trips which require a wheelchair lift. Comingling trips with DAR has the potential to increase response times and increase ridership on the proposed Route 8 microtransit service. Caution must be taken in that ADA regulations must continue to be met. ADA eligible rides cannot be denied because of a non-ADA microtransit ride, and ADA eligible rides must still receive priority on DAR.

Figure 1
Lakeport and West Shore Activity Centers



If implemented, microtransit should use existing buses and drivers and operate as a pilot program. If successful, smaller zero-emission vans could be purchased for the service. Equity is another consideration. City of Clearlake residents may feel as if they are being treated inequitably if Lakeport residents have access to a door-to-door service.

Route 4 – Serve Konocti Vista Casino

Route 4 travels between downtown Lakeport, Kelseyville, Lower Lake and Clearlake on hourly headways using one bus. Similarly, Route 4a travels between Lakeport and Kits Corner but also serves the Konocti Vista Casino and Soda Bay. Route 4a has very low ridership and is not cost effective. If Route 4a is eliminated, as discussed above, there would be three fewer round trips a day between Konocti Vista Casino and Lakeport or Kits Corner. One option is to eliminate Route 4a as discussed above and include the Konocti Vista Casino in the Route 4 service area.

Factoring in the need for driver breaks and connections to Route 7, Route 4 could serve the Konocti Vista Casino/Big Valley Rancheria 4 times in the eastbound direction and 4 times in the westbound direction. This would not increase vehicle service hours as the time used to serve the Casino would come from extra layover time. Annual vehicle miles would increase by 4,435. According to Route 4a ridership data, less than one boarding a day occurs at the Konocti Vista Casino. Therefore, ridership would only be increased by around 125 one-way trips per year. Adding 10 minutes to half of the runs is also likely to inconvenience some passengers and reduce ridership slightly to around 110 trips per year. This equates to an annual operating subsidy of $2,800 per year.

Route 4 – Serve Riviera Shopping Center

Similarly, Route 4 could spend an extra 7 minutes on 4 daily round trips serving the Riviera Shopping Center instead of the Casino (as the Casino is served by Route 8). This would only be needed if Route 4a were eliminated. Although timewise, service to Riviera Shopping Center would take a few less minutes each round trip than serving the Casino, the annual mileage would be slightly higher. Although there are a significant number of homes within a half mile walk of the Riviera Shopping Center, this stop on Route 4a sees less than one passenger boarding per day. Ridership on Route 4 would likely only increase by 110 trips per year and annual operating subsidy would increase by $4,400 per year.

South Clear Lake On-Demand Service

As noted above, Routes 2 and 4a both had very low productivity rates of less than one passenger-trip per hour in FY 2021-22. In this same fiscal year, Route 2 and 4a cost on average $133 and $99 per passenger trip to operate, respectively, whereas the system as a whole cost around $19 per passenger-trip to operate. Between April and September of 2022, Route 4a was suspended and Route 2 service was reduced to one quarter of the levels previously served. Monthly ridership on Route 2 has increased from around 70 trips per month to 200 trips per month as service was reinstated. Monthly ridership on Route 4a is similar to what it was before the route was suspended. Monthly ridership trends for the first three months of full operation (August – October 2022) show that the operating cost per trip for Route 2 dropped significantly to $58 per trip from $133 on Route 2. Route 4a operating cost per trips has stayed relatively similar at $91 per trip versus $99 in FY 2021-22.

Regardless, both these routes are expensive on a cost per trip basis, do not attain the performance standards, and may not be the best use of public funds. However, there are Lake County residents in the communities of Cobb, Loch Lomond and Soda Bay who would no longer have a public transit option if Routes 2 and 4a were eliminated. Under this alternative, Routes 4a and/or 2 would be eliminated and replaced with an on-demand door to door service in the south Clear Lake area.

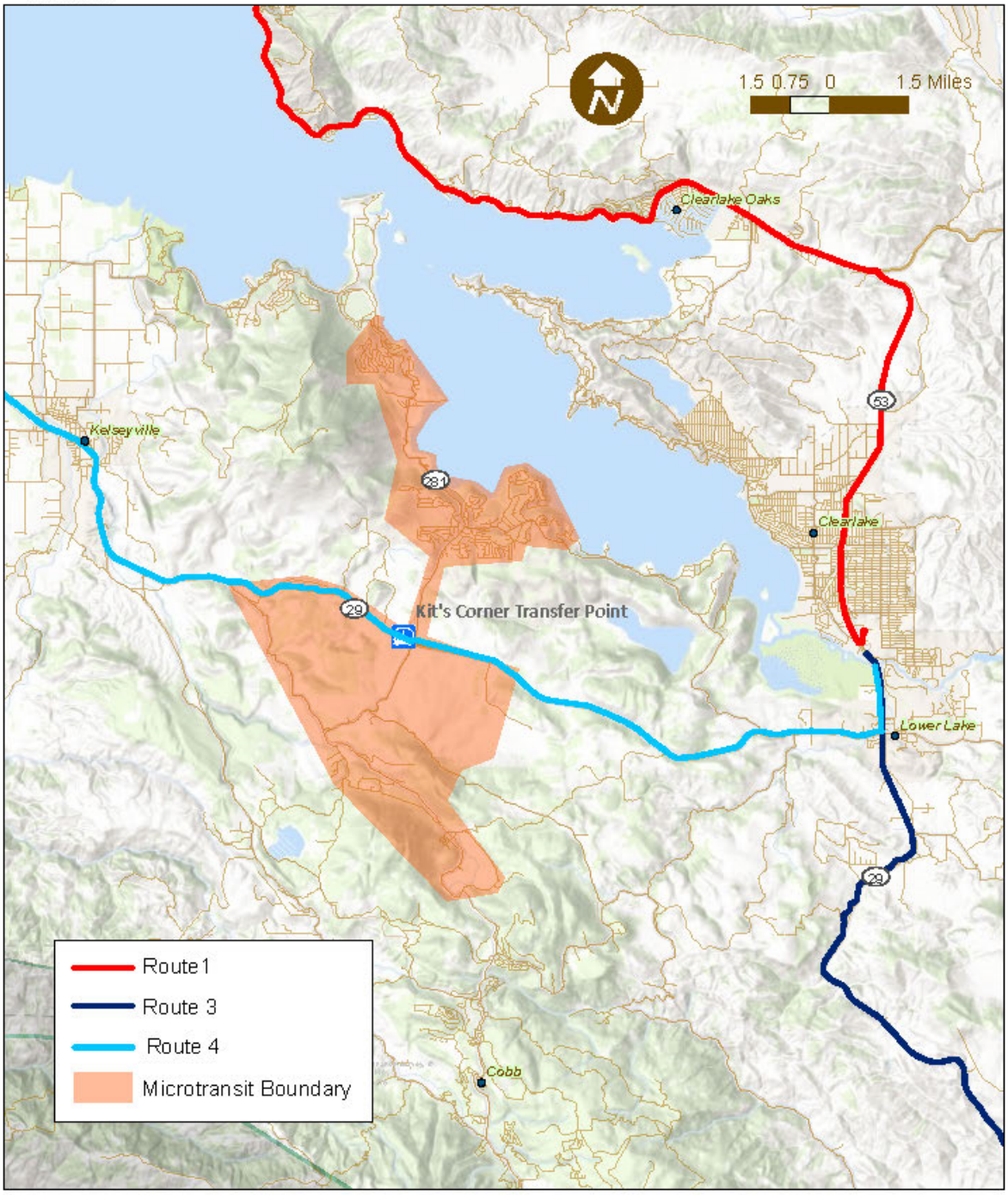
Under the first option, Route 4a would be eliminated and replaced with an on-demand microtransit service using one van. The purpose of the South Clear Lake On-demand service would be to connect residents with Route 4 at Kits Corner so that passengers could travel to either Lakeport or Clearlake; however, trips within the service area would be allowed. The van would be available from 8 AM to 5 PM, only three days a week, in an effort to be more cost effective. A specific service area would need to be defined so that service could be provided within 30 minutes and passengers could reliably make a connection to Route 4. Therefore, the boundaries of the service area should be no more than a 10-minute drive from Kits Corner. This equates to all of the Clear Lake Riviera and as far north on Soda Bay Road at Crystal Drive. To the south of Kits Corner, the service area would extend as far as Salmina Road off of Highway 175 (which includes very few homes). Other areas to the east and west along Highway 29 would also be served (which also includes very few homes). This area is shown in Figure 2.

Route 4a travels right through the middle of the relatively dense community of Clear Lake Riviera (population of 4,400). An on-demand service has the potential to directly serve 5,200 homes instead of only those within a short walking distance of Soda Bay Road and Highway 175. Ridership demand on the South Clear Lake On-demand service is estimated to be similar to that seen in the community of Kelseyville which is served fairly frequently by Route 4. This equates to around 14 trips per day. Note that the existing Route 4a service carries around 6 trips per day. As the on-demand service would only operate three days per week, it would cost $13,000 less than operating Route 4a five days per week annually and carry nearly 1,110 more passenger-trips. It would be reasonable to charge $1.25 per one-way trip, which is equal to the current local fare.

The second option would be to also eliminate Route 2 as a small portion of the Route 2 service area could be served by the South Clear Lake On-Demand service. This would save around $111,000 annually over status quo but lose 990 trips. The communities of Cobb, Loch Lomond, Hobergs and Anderson Springs would no longer have transit service.

Both of these options could be operated as either an on-demand Dial-A-Ride service or an on-demand microtransit service with an app available for requesting rides. The app would add around $500 per vehicle per month and $11,500 in fixed costs. The fixed technology costs could be shared with other services if multiple microtransit options are implemented. This cost is reflected in the annual operating subsidy requirements in Table 1.

Figure 2
Clear Lake Microtransit



Service Alternatives for the City of Clearlake

Shift Schedule for Route 12 to Provide More Frequent Service Overall for the City of Clearlake

Routes 10, 11, and 12 all serve the City of Clearlake. Route 10 has the most ridership out of all LTA routes, 37,000 annual one-way passenger-trips, and carries around 10 trips per hour. Route 11 is the second most productive of the three local Clearlake routes with 7 trips per vehicle hour while Route 12 has relatively poor ridership with 1,765 annual ridership and 3 trips per vehicle hour in FY 2021-22. It should be noted that Route 12 service was reduced during the pandemic and ridership has been increasing since being reinstated. Based on average daily ridership for July through September 2022, Route 12 will carry around 5,800 trips in FY 2022-23. All routes are operated on hourly headways using one bus for each route, and all routes meet at the Walmart transfer point at the top of the hour. Routes 10 and 12 serve a similar area with a few differences:

- Route 10 does a loop in the northern neighborhood along Bush Street.
- Route 10 serves the Veterans and Clearlake Family Clinics (Route 12 does not). These are high boarding locations.
- Route 12 serves the Walnut Grove Apartments and Senior Center and Woodland College (Route 10 does not). These stops are low boarding locations.
- Route 12 serves a loop in Lower Lake at the top of the hour while Route 10 does the same at the end of the hour.
- Route 10 serves stops along Old Highway 53 in the northbound direction only
- Route 10 and Route 12 both serve the loop along Lakeshore, Olympic and Old Highway 53, but in opposite directions.
- Route 12 is in service from 8:00 AM to 5:00 PM; whereas Routes 10 and 11 are in service from 6:00 AM to 7:30 PM.

Route 11 focuses on serving the “Avenues” residential neighborhood along with the same main loop to Austin Park/City Hall. Route 11 also serves the Walnut Grove Apartments, Senior Center and Woodland College. Route 11 does not serve Lower Lake.

Over the years, Route 12 has been the first route to be reduced when there was a need for service reductions (COVID, etc.). This in turn can have the unwanted impact of passengers getting used to riding Routes 10 and 11 and no longer needing Route 12. Another reason for low ridership on Route 12 could be that scheduled timepoints at several major stops are within ten minutes of each other for the three routes. For example, total boarding and alighting data for the City of Clearlake show that Walmart, Burns Valley Mall and Austin Park/City Hall are the top 3 boarding locations. All three routes leave Walmart at the same time, then Route 10 serves the Burns Valley Mall at 10 minutes after the hour, Route 11 serves Burns Valley Mall at 22 minutes after the hour and Route 12 serves the same stop at 29 minutes after the hour. No routes arrive at the Burns Valley Mall for a 40-minute period. This means that most passengers at Burns Valley Mall and Austin Park/City Hall have already been picked up by Routes 10 and 11 by the time Route 12 arrives.

Therefore, one option is to shift the Route 12 schedule roughly 30 minutes off of the Route 10 schedule so that there is half-hourly service to most of the stops on Route 10. In this scenario, Route 12 would operate the loop to the north first and the loop to Lower Lake second, as Route 10 does. As seen in Table 3, a revised schedule allows for boardings at the Burns Valley Mall at 10 minutes past the hour (Route 10), 22 minutes past the hour (Route 11) and 42 minutes past the hour. Per the revised schedule, Route 12 could have a timed connection with Routes 10 and 11 at Walmart before Route 12 operates the Lower Lake Loop. Note that service to Lower Lake under this alternative would be similar as the current schedule which is roughly half-hourly service.

Table 3: Route 12 Example Revised Schedule

Walmart	Old 53 & Lakeshore	Austin Park	Burns Valley Mall	Senior Center	Old 53 & Lakeshore	Walmart	Woodland College	Lake County Social Services	Highway 53 & Main St.	Lower Lake High School	Walmart
8:28 AM	8:35 AM	8:40 AM	8:42 AM	8:46 AM	8:52 AM	9:00 AM	9:02 AM	9:06 AM	9:09 AM	9:12 AM	9:17 AM
9:28 AM	9:35 AM	9:40 AM	9:42 AM	9:46 AM	9:52 AM	10:00 AM	10:02 AM	10:06 AM	10:09 AM	10:12 AM	10:17 AM
10:28 AM	10:35 AM	10:40 AM	10:42 AM	10:46 AM	10:52 AM	11:00 AM	11:02 AM	11:06 AM	11:09 AM	11:12 AM	11:17 AM
11:28 AM	11:35 AM	11:40 AM	11:42 AM	11:46 AM	11:52 AM	12:00 PM	12:02 PM	12:06 PM	12:09 PM	12:12 PM	12:17 PM
12:28 PM	12:35 PM	12:40 PM	12:42 PM	12:46 PM	12:52 PM	1:00 PM	1:02 PM	1:06 PM	1:09 PM	1:12 PM	1:17 PM
1:28 PM	1:35 PM	1:40 PM	1:42 PM	1:46 PM	1:52 PM	2:00 PM	2:02 PM	2:06 PM	2:09 PM	2:12 PM	2:17 PM
2:28 PM	2:35 PM	2:40 PM	2:42 PM	2:46 PM	2:52 PM	3:00 PM	3:02 PM	3:06 PM	3:09 PM	3:12 PM	3:17 PM
3:28 PM	3:35 PM	3:40 PM	3:42 PM	3:46 PM	3:52 PM	4:00 PM	4:02 PM	4:06 PM	4:09 PM	4:12 PM	4:17 PM
4:28 PM	4:35 PM	4:40 PM	4:42 PM	4:46 PM	4:52 PM	5:00 PM	5:02 PM	5:06 PM	5:09 PM	5:12 PM	5:17 PM

There would be no cost impacts to this alternative as service hours would not be increased, only shifted. However, ridership can be expected to increase by around 1,080 trips per year or 4 trips per service day. This would reduce the annual operating subsidy by $1,450 per year.

Serve New Developments

It is important to review short-term planned developments to ensure that bus routes are serving new developments. The City of Clearlake has two housing projects which are currently being built and a proposed sports complex and hotel development:

- Oak Valley Villas – 80-unit complex near the intersection of Burns Valley Road and Rumsey Road. The units are considered affordable housing units reserved for those ranging from 30 to 60 percent of the median income.
- 102-unit housing complex off Hwy 53.

- City of Clearlake Sports Complex and Sports Field located off of Olympic/Burns Valley Road. This may include baseball fields, soccer fields, indoor recreation complex for use for public events, basketball courts, volleyball courts, concessions. The west side of the project would include a new public works yard and police complex to store vehicles and heavy equipment.
- Proposed 75-room hotel on the old airport property at the end of 18th Avenue.
- Proposed commercial retail complex on Dam Road Extension – This would be located within walking distance of the new transit center.

All these planned and proposed developments are located within walking distance of Clearlake fixed routes. For instance, Routes 11 and 12 already serve the Oak Valley Villas location almost directly, and even Route 10 is only one-half mile away, particularly if Route 10 passengers access the Oak Valley Villas through the back of the Burns Valley Mall property.

Clearlake Microtransit

On demand microtransit service was considered in the City of Clearlake. Routes 10, 11 and 12 have an average productivity rate of 8 passenger-trips per hour. This is very productive for a rural transit service. A sample of ridership data shows that during the 2:00 PM hour as many as 28 boardings occur on the combined Clearlake Routes. Even if many of these boardings were able to be grouped through a microtransit app, it would still require around 6 vehicles operating during that hour to meet the same level of demand which the three fixed routes (using 3 vehicles) are meeting now. Additionally, the majority of homes in the City of Clearlake are located within one-half mile (a reasonable walking distance) of the fixed route. As it would increase the number of vehicles needed to serve Clearlake and thereby increase costs while not expanding service area, microtransit is not a good option for Clearlake and is not considered further.

Lifeline Transit Service to Spring Valley

Spring Valley is a small community 7 miles north of Clearlake scattered along an approximate six-mile-long area between New Long Valley Road and Spring Valley Road. It consists of 400 rural residential households with a population of approximately 1,050. Serving this community has been identified as an unmet transit need multiple times.

Route 1 travels within 8 miles or roughly a 15-minute travel time of Spring Valley. There is not sufficient time in the schedule to serve Spring Valley on Route 1 in addition to the fact that it would severely inconvenience existing Route 1 passengers and reduce ridership. Therefore, one option would be to operate lifeline service from Clearlake/Lower Lake to Spring Valley two times per day, one day a week. This service would be by advance reservation only. One van could be used to travel to Spring Valley around 9 AM, pick up passengers along a loop including New Long Valley Road, Shasta Road and Spring Valley Road. Passengers could be dropped off at Walmart in Clearlake or Highway 53 & Main in Lower Lake before returning to the yard. As shown in Table 1, this would cost on the order of $10,700 annually. There are no zero-vehicle households in Spring Valley and 43 one-vehicle households. Ridership for Route 2 shows that on average 1.3 passengers board in the rural communities of Cobb and Loch Lomand. This equates to an annual ridership per capita of 0.27 for these communities. Applying this per capita rate and adjusting for the fact that Route 2 operates five

days per week and three round trips per day, it is anticipated that lifeline service to Spring Valley would generate around 120 one-way passenger-trips annually.

Additional Planned Saturday Service

Reinstating Saturday Service was a common request for the on-board surveys. LTA recently reimplemented partial Saturday service in September of 2022 on Routes 1 ,4, 8, 10 and 11. As ridership continues to rebound and staffing shortages are resolved, LTA is planning on reinstating more Saturday service. In order to develop a five-year financial plan, it is important to estimate the costs and ridership impacts of planned service changes.

Currently Route 2, 3, 4a, 7 and 12 do not have Saturday service. Routes 2, 4a, and 12 did not operate on Saturdays even before the pandemic, and there is still no justification for Saturday service along these routes given their low ridership and the costs that would be required, particularly if the LTA budget is anticipated to remain at or near status quo levels over the next five years. Therefore, adding Saturday service to Routes 3 and 7 are the only changes analyzed as part of this alternative.

Route 3 operates four daily round trips on weekdays between Clearlake and Napa County destinations with connections to St. Helena Hospital, Vine Transit and intercity transit services. Passengers wishing to make a day trip to Napa County from Lake County would need 4 hours or so in Napa to go to medical appointments or do errands. Therefore, at least two round trips on Saturday should be considered. This would cost on the order of $19,100. Based on ridership data by day for other transit agencies in Lassen and Butte counties, Saturday ridership typically represents roughly 50 percent of weekday ridership. However, according to on-board surveys, a good portion or roughly 45 percent of Routes 3 passengers use this bus for school, medical appointment or work purposes which would not likely occur on Saturdays. Therefore, it is estimated that Saturday ridership on Route 3 would be roughly 40 percent of average weekday ridership. This equates to an annual operating subsidy of $17,700. As Route 3 is partially funded with FTA 5311(f) grant money, half of the cost of operating Saturday service could be subsidized with FTA 5311(f) funds.

Route 7 is another LTA intercity route which travels between Lakeport and Ukiah. Four round trips a day are offered with connections to Greyhound, Amtrak and Mendocino Transit Authority (MTA) (which has connections to Santa Rosa). As with Route 3, two round trips per day should be considered for Saturday service to allow for a trip to and from Santa Rosa in one day. The existing 8 AM and 3 PM departures from Lakeport would allow for good connections with MTA to/from Santa Rosa. Saturday service on Route 7 would cost approximately $18,400 annually. Ridership for this alternative is estimated at 17 trips a day or 880 per year. This equates to an annual operating subsidy of $16,200 per year. As Route 7 also receives FTA 5311(f) funding, it is likely that a subsidy of only $8,100 per year would be required.

Add Sunday Service

Transit service on Sundays was a popular request in the surveys. Generally, Sunday ridership is roughly one-half of Saturday ridership. To operate Sunday service at levels similar to current Saturday

service would cost of the order of $122,900 annually and carry an average of 112 trips each Sunday on combined Route 1, 4, 8, 10, and 11. This equates to an annual operating subsidy of $111,000.

Given the potential for low ridership and the high cost of providing service, another option would be to offer on-demand microtransit in the major community centers. A pilot project could be tested in the City of Clearlake by offering on-demand microtransit service on Sundays from 9:00 AM to 3:00 PM using two vans. This would cost on the order of $31,300.

Shasta Regional Transportation Agency implemented an on-demand microtransit service on Sundays in the City of Redding called Shasta Connect. Service operates from 6:30 AM to 7:30 PM and carries around 68 one-way passenger-trips daily. It is likely that ridership on a Sunday microtransit service in Clearlake would also have low ridership, particularly as microtransit is not currently available in Lake County so passengers are not familiar with the technology yet. Based on the microtransit ridership per capita rate for the Shasta Connect service in Redding, Sunday microtransit in Clearlake could be expected to carry around 12 trips per day on average.

If Saturday Service productivity levels remain at the 2 – 3 trips per hour level in Clearlake, another consideration would be to switch both Saturday and Sunday service to microtransit. This has the advantage of making the type of service provided on weekends more consistent; however, microtransit service available only 2 days per week may not be effective.

Intercity Service to Santa Rosa

The top out-of-county destinations for both on-board survey and community survey respondents was Ukiah/Santa Rosa. When asked about the likelihood of increased public transit usage if there was more service to Ukiah and Santa Rosa, 40 percent of community survey respondents said they would "definitely take transit". As part of the Transit and Intercity Rail Capital Program (TIRCP) grant awarded to LTA for construction of a new transit center in Clearlake, LTA will purchase 4 hydrogen fueled buses with associated infrastructure and expand out of county transit service to the Sonoma County Airport and the Santa Rosa Bus Terminal in downtown Santa Rosa. This section discusses a couple of options for providing out-of-county service to Santa Rosa over the short-term.

Extend Route 7

One option would be to extend Route 7 from the current terminus in Ukiah to Santa Rosa once a day. This would cost an additional $52,200 annually and take an extra 3 hours each service day. Route 7 is interlined with Route 4; therefore, adjustments to the overall driver schedule would need to be made. If the second westbound departure were extended to Santa Rosa, a one-way trip would take 3 hours for Lakeport resident and 4 hours for a Clearlake resident. This option would not allow for layover time in Santa Rosa.

This one additional trip to Santa Rosa from Ukiah would not significantly increase options for Lake County residents needing to travel to Santa Rosa. Currently, LTA passengers could take the first Route 7 westbound departure at 8:00 AM and arrive at the Pear Tree Center in Ukiah only 6 minutes prior to the departure of the MTA CC Rider Route 65 to Santa Rosa. In the afternoon the same passenger

could ride MTA from Santa Rosa to Ukiah and have only a one-hour layover before returning to Lake County on Route 7. Amtrak and Greyhound provide intercity connections from Ukiah to Santa Rosa. Amtrak Thruway buses serve the Pear Tree Center at 2:05 PM seven days a week. Greyhound serves the Ukiah Airport at between 12:00 PM and 1:00 PM on select days of the week. With this in mind, it is estimated that extending Route 7 to Santa Rosa would increase annual ridership by 230 trips per year or 1 trip per day. In short, there is little benefit to duplicating existing intercity services between Ukiah and Santa Rosa.

Extend Route 3

Perhaps a better option is to extend Route 3 from Calistoga to Santa Rosa once a day. This would cost around $21,600 less than the Route 7 option and add two vehicle hours daily instead of three. Currently, there are no connecting services between Calistoga and Santa Rosa. In this scenario the second southbound Route 3 trip (7:55 AM departure) could be extended to Santa Rosa. Service to the St. Helena Hospital would need to be shifted to the 6:10 AM southbound run. This would allow connections from Lakeport on Route 1 at Walmart at 7:55 AM. The same bus would depart Santa Rosa at around 10 AM and return to Clearlake around 12:10 PM. It would take a Clearlake resident 2 hours to get to Santa Rosa and a Lakeport resident 3.5 hours. Ridership would likely be greater on this option than the previous Route 7 option; however, demand would be limited as this scenario does not allow for a round trip and there are currently options to travel to Santa Rosa via Route 7 and MTA, Amtrak or Greyhound. Route 3 does not interline with other routes, so significant schedule adjustments would not be required.

On average 3 to 4 passengers board or alight in Deer Park and Calistoga daily. According to on-board surveys, both of the Route 3 respondents travelling to Calistoga were going to work. As mentioned above this alternative would primarily service Lake County residents needing to transfer to intercity transit services. Intercity ridership per capita rates for other intercity transit services in Modoc County were reviewed and applied to the City of Clearlake. With all these factors in mind, it is estimated that roughly 3 passenger-trips per day would be generated by an extension to Santa Rosa. It would be reasonable to charge a higher intercity fare to Santa Rosa ($6.00 vs. $5.00 to Calistoga) This leads to an annual operating subsidy of $26,000.

Both of these options could be included on a future FTA 5311(f) application to reduce local operating subsidy requirements by one half.

COMPARISON OF SERVICE ALTERNATIVES AND PERFORMANCE ANALYSIS

The productivity and cost-effectiveness of the alternatives discussed above are compared in Table 4 and Figures 2 -6.

Table 4: Comparison of Service Alternatives

FY 2023-24

Shading Indicates Does Not Meet Minimum Standard

Shading Indicates Meets Minimum Standard

Alternative	Change from Existing Service: Annual Ridership	Change from Existing Service: Annual Operating Cost (1)		Performance Measures: Marginal Operating Cost per Veh-Hour	Performance Measures: Marginal Farebox Ratio	Performance Measures: Marginal Passenger-trips per Veh-Hour	Performance Measures: Marginal Operating Cost per Passenger Trip	Performance Measures: Operating Cost per Trip Minimum Standard	Performance Measures: Marginal Subsidy Per Passenger-Trip
Status Quo (Systemwide Total Costs)	196,364	$3,414,282		$91	11%	5.25	$17.39	$19.50	$8.27
Alternatives Which Increase or Maintain Service									
Route 1 - Add 4 RT using one additional bus	7,800	$171,700		$57	9.1%	2.6	$22.01	$20.00	$20.01
Route 4 - Serve Konocti Vista Casino	110	$3,000		NA	4.2%	NA	$27.27	$40.00	$25.45
Route 4 - Serve Riviera Shopping Center	110	$4,600		NA	4.3%	NA	$27.27	$40.00	$40.00
Route 7 - Replace Final RT with Early RT	-130	$30,200	2	$60	-1.1%	-0.3	-$232.31	$40.00	-$234.92
Route 12 - Shift schedule by 30 minutes	1,080	$0		NA	--	NA	$0	$12.50	-$1.34
Lifeline service to Spring Valley	120	$10,700		$51	2.2%	0.6	$89.17	$45.00	$87.17
Sunday Service - Fixed Routes 1, 4, 8, 10, 11	5,940	$122,900		$53	9.7%	2.6	$20.69	$19.50	$18.69
Clearlake Sunday Service - Microtransit	600	$54,800	3	$100	3.2%	1.9	$91.33	$50.00	$89.67
Route 7 - Extend to Santa Rosa 1 RT	230	$51,400	2	$68	1.6%	0.3	$223.48	$40.00	$220.00
Route 3 - Extend to Santa Rosa 1 RT	630	$29,800	2	$59	7.0%	1.3	$47.30	$40.00	$43.97
Alternatives Which Decrease Service									
Route 2 - Reduce service to 3 days per week	-600	-$29,700		$58	4%	1.2	$49.50	$45.00	$47.50
Route 2 - Eliminate service	-2,100	-$98,000		$54	4%	1.2	$46.67	$45.00	$44.67
Route 4a - Reduce service to 3 days per week	-400	-$34,100		$61	3%	0.7	$85.25	$45.00	$83.05
Route 4a - Eliminate First Daily Roundtrip (9:16 AM)	-250	-$19,600		$60	3%	0.8	$78.40	$45.00	$76.00
Route 4a - Eliminate service	-1,560	-$80,800		$59	4%	1.1	$51.79	$45.00	$49.62
Route 8 - Replace with Microtransit	290	-$15,800	3	$28	-1.3%	-0.2	-$54.48	$12.50	-$56.21
South Clear Lake Microtransit, Eliminate Route 4a	1,110	$3,900	3	$76	5%	-6.2	$3.51	$50.00	$4.14
South Clear Lake Microtransit, Eliminate Route 4a and 2	-993	-$94,100	3	$56	4%	0.5	$94.81	$50.00	$83.83

Note 1: Does not include fixed costs except for Status Quo Option

Note 2: Does not include competitive FTA 5311(f) grant funds

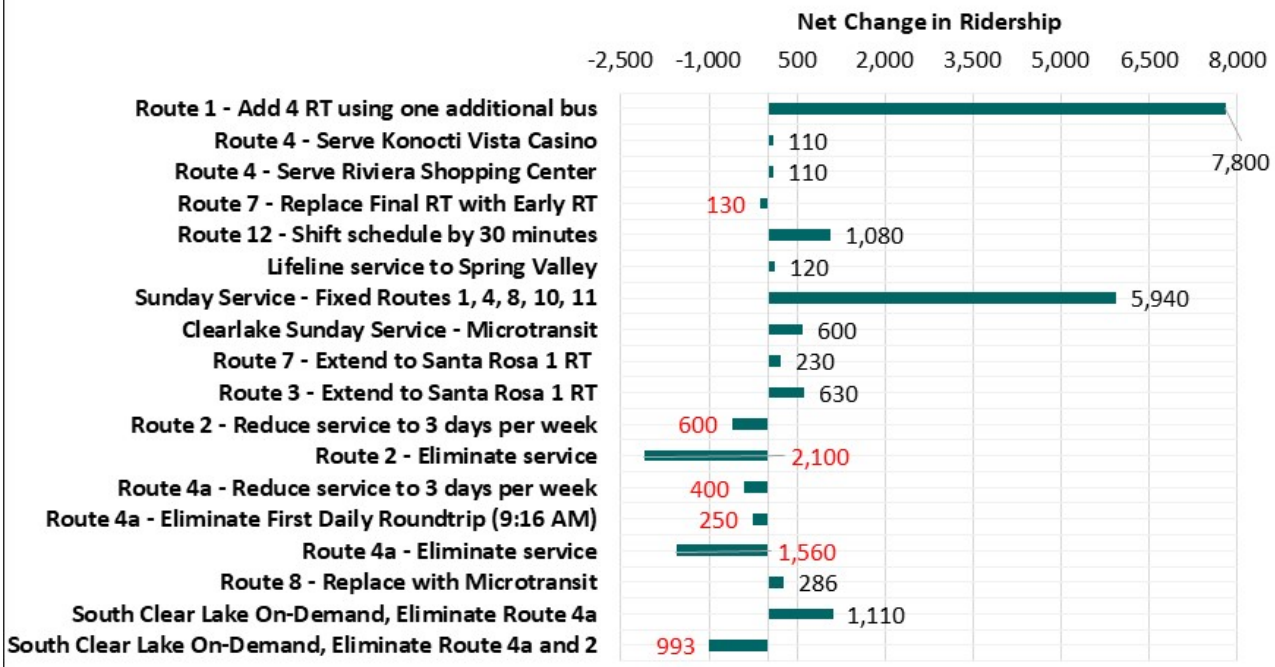
NA = Not applicable, as vehicle-hours do not change.

Note 3: Includes technology costs for microtransit app

Change in Ridership over Base Case Scenario

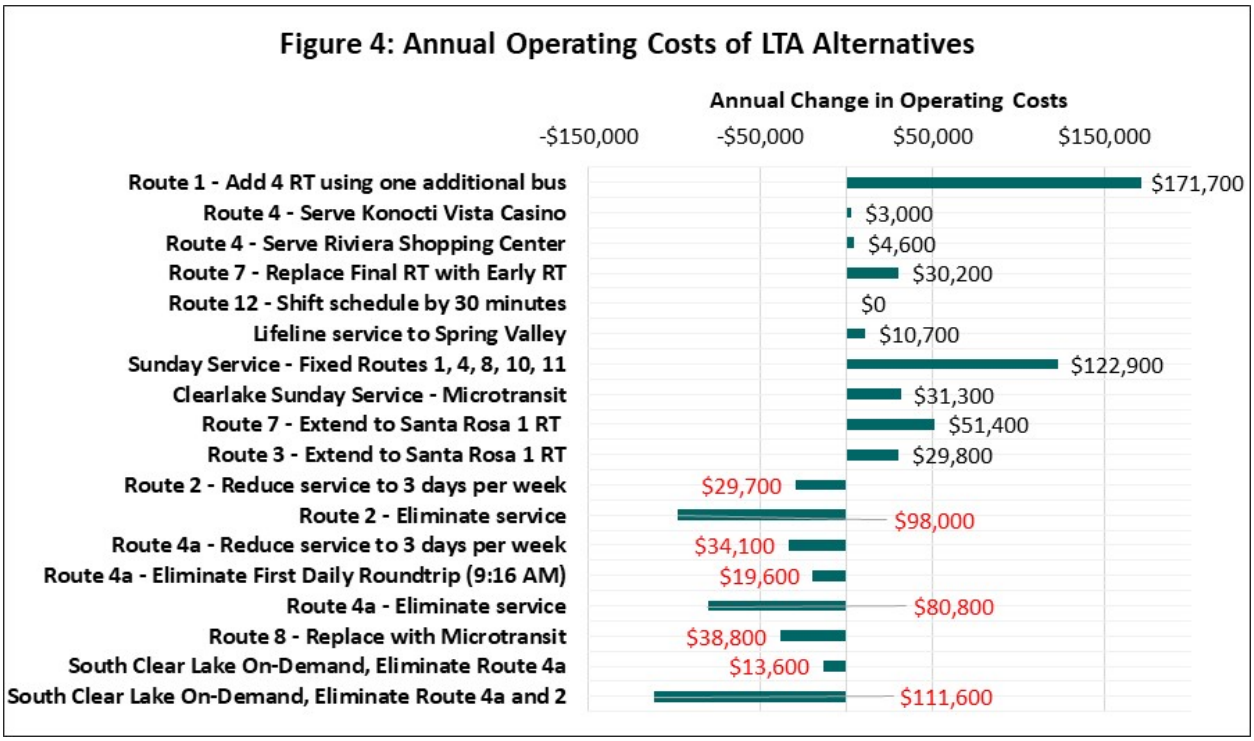
Ridership impacts of all the alternatives are presented in Figure 3. As shown, Increasing Frequency on Route 1 would have the greatest positive impact on ridership, 7,800 trips, followed by Sunday Service on the Fixed Routes, 5,940 trips. Serving the Konocti Vista Casino or the Riviera Shopping Center on Route 4 would have very little increase over base case scenario ridership, as would lifeline service to Spring Valley. Of the alternatives which eliminate or reduce transit service, South Clear Lake On-Demand, eliminate 4a option would actually increase ridership (1,110 trips) although service is decreased.

Figure 3: Annual Ridership of LTA Alternatives



Change in Operating Cost Impacts from Base Case Scenario

Figure 4 compares marginal (change from base case) operating costs of the alternatives discussed above. Increasing Frequency on Route 1 or adding Sunday Fixed Route service would increase the annual operating budget by over $120,000. Shifting the Route 12 Schedule would have no impact on operating costs and Replacing Route 8 with Microtransit would decrease annual operating costs by $38,000. Of the options which eliminate or decrease service, South Clear Lake On-Demand, Eliminating Route 4a and 2 would save the most money, $111,000 per year.



Change in Productivity from Base Case Scenario

For the alternatives which increase vehicle service hours over the base case scenario, Increased Frequency on Route 1, Sunday Fixed Route Service and Sunday Microtransit Service in Clearlake will increase productivity by or above 2 trips per vehicle hour. For the South Clear Lake On-Demand, Eliminate Route 4a option, for every vehicle hour eliminated there will be an increase in 3.9 passenger-trips (Figure 5). For the option eliminating both Routes 4a and 2, only 0.5 passenger-trips would be lost for every vehicle-hour of reduced service.

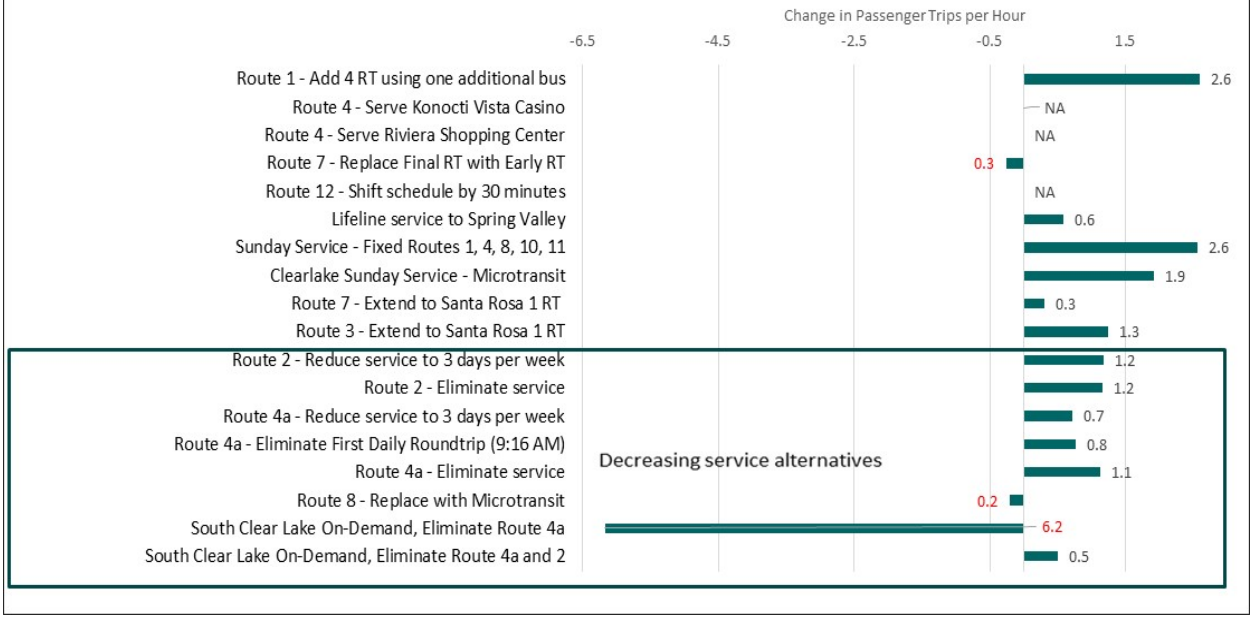
Change in Operating Cost per Trip from Base Case Scenario

For the alternatives which increase or maintain service, the following meet the LTA minimum standard for the specific type of service (as shown in Table 20c of Technical Memorandum One), as noted by the green shading in Table 4:

- Route 4 - Serve Konocti Vista Casino
- Route 4 - Serve Riviera Shopping Center
- Route 7 – Replace Final RT with Early RT
- Route 8 - Replace with Microtransit
- Route 12 - Shift schedule by 30 minutes
- Route 3 - Extend to Santa Rosa 1 RT

For those alternatives that decrease ridership and decrease cost requirements, a higher figure is better, in that it indicates a greater funding savings for every passenger trip eliminated. All the decreasing service alternatives will save at least $50.00 per passenger-trip eliminated and are therefore considered to be consistent with the performance measure. The South Clear Lake On-Demand Eliminate Route 4a and Replacing Route 8 with microtransit option decreases service but increases ridership, resulting a negative number that reflects a positive change.

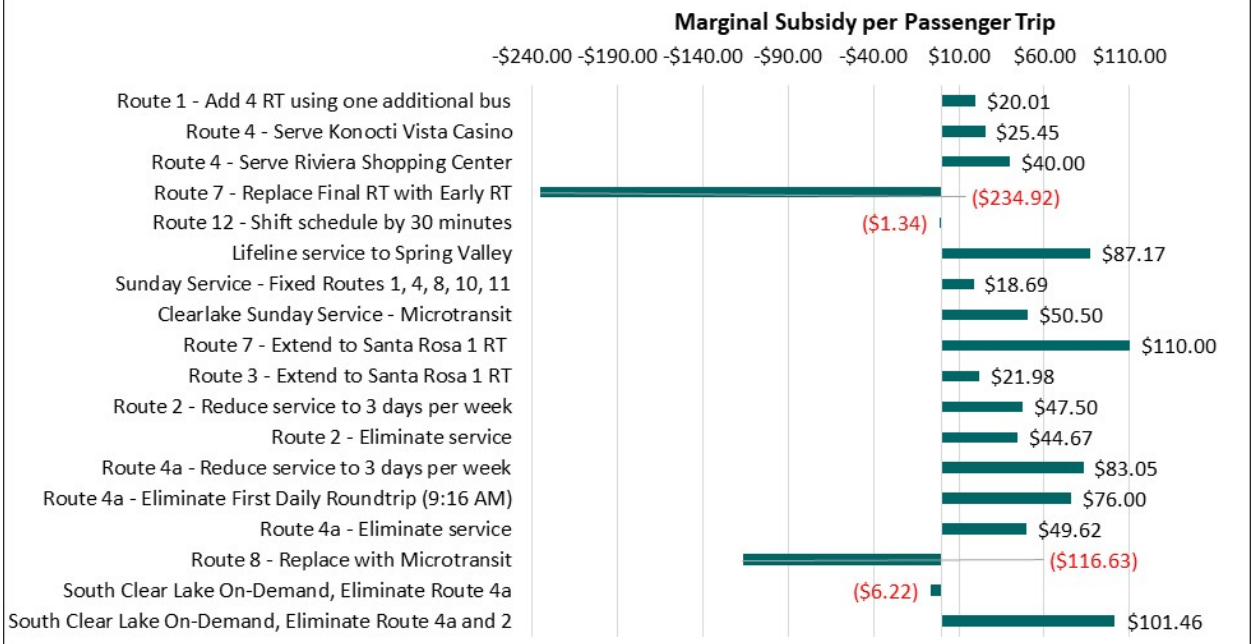
Figure 5: Passenger Trips per Hour of LTA Alternatives



Change in Operating Subsidy per Trip from Base Case Scenario

As shown in Figure 6, Replacing Route 8 with Microtransit will decrease operating subsidy by $116 for every passenger-trip gained. Although this alternative has a modest ridership increase, there is the potential for good operating subsidy savings. Lifeline service to Spring Valley and Extending Route 7 to Santa Rosa will be rather expensive to implement when compared on an operating subsidy per trip basis. For alternatives which decrease service, again, higher figures are better as they represent the greatest savings per trip lost.

Figure 6: Marginal Operating Subsidy per Passenger Trip of LTA Alternatives

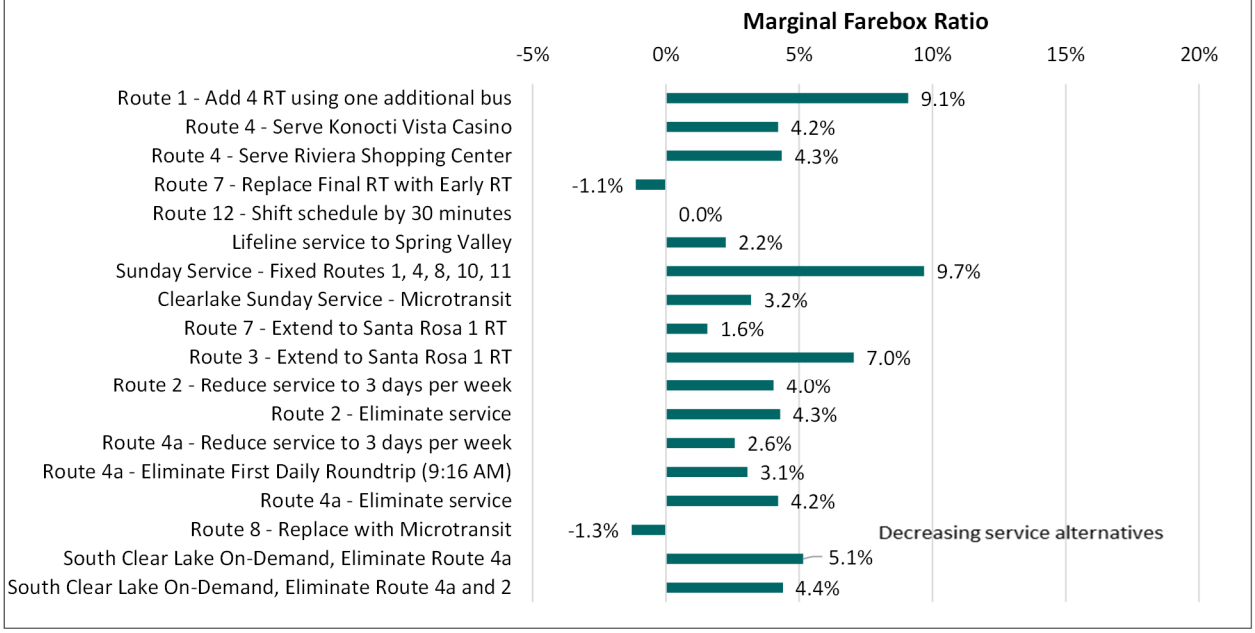


Change in Farebox Ratio from Base Case Scenario

Finally, the marginal farebox ratio (marginal fare revenues divided by marginal operating costs) can be calculated. This is useful in assessing whether individual service alternatives help to attain the overall local farebox ratio standard of 10 percent (Figure 7):

- Of those that increase both fare revenues and costs, only the Route 3 extension to Santa Rosa of meets the TDA standard of 10 percent, although increasing frequency on Route 1 is close at 9 percent.
- Alternatives that decrease both fare revenues and costs are consistent with the standard, if the farebox ratio is below the 10 percent minimum standard. All of the decreasing service alternatives fit into this category.
- Those alternatives that increase fare revenues while decreasing costs or with no cost impacts are consistent with the standard, though this results in a negative ratio. Replacing Route 8 with microtransit and shifting the schedule for Route 12 fit into this category.

Figure 7: Marginal Farebox Ratio of LTA Alternatives



Performance Analysis Findings

There are a few options in the service alternative analysis which stand out:

- Replacing Route 8 with microtransit has the potential for operating cost savings combined with a small increase in ridership. However, this would also require procurement of software which would add to the annual costs. There may also be an adjustment period for passengers to get used to the new service. However, microtransit is becoming popular in many areas and could help to "revive" public transit ridership.
- Route 7 – Eliminating the Last Round Trip and Replacing with an Earlier Round trip has the potential for ridership increase with a relatively low operating subsidy, as this route is partially funded with FTA grants. This would also address public/stakeholder requests for better service to Ukiah while increasing frequency on Route 4.
- Shifting the Route 12 Schedule by 30 minutes is another alternative which does not increase costs yet increases ridership in the City of Clearlake.
- Increasing Frequency on Route 1 would bring in a significant increase in ridership while almost making the 10 percent farebox ratio. This alternative comes with a high price tag and should only be considered if sufficient revenue is available throughout the five-year planning period.
- Extending Route 3 to Santa Rosa via Calistoga would meet operating subsidy and farebox ratio standards if a higher fare is charged and FTA 5311f funds are procured. This alternative would address the public's desire for more service to Santa Rosa and could be the first step to a more frequent intercity service when TIRCP grant fund vehicles are acquired.

- Eliminating the First Roundtrip on 4a provides the most cost savings for every passenger-trip eliminated of all the alternatives which reduce service.
- Replacing Route 4a with a South Clear Lake microtransit service would reduce subsidy needs and would increase ridership by providing service beyond the existing fixed route.
- Replacing both Routes 2 and 4a with a South Clear Lake microtransit service would save a significant level of subsidy funding ($114,400). It would reduce ridership by a modest amount (1,403 per year) and eliminate transit service to the Cobb and Whispering Pines areas, but the existing Route 2 service is very cost-inefficient.

LAKE LINKS PROGRAMS

As the Consolidated Transportation Service Agency (CTSA) for Lake County, Lake Links provides and administers transportation services for seniors, disabled persons, and low-income individuals when fixed route or DAR service is not available. Lake Links administers the Medi-Links program which provides Non-Emergency Medical Transportation service to Ukiah and Santa Rosa, using Paratransit Services drivers and LTA vehicles. As noted in Technical Memorandum 1, the NEMT Ukiah and Santa Rosa programs are very expensive to operate with respective cost per trip of $226 and $312.

A much more cost-effective program is the Pay Your Pal program. This is a transportation reimbursement program where qualified passengers ask a friend or family member take them to the medical appointment and they are reimbursed at $.40 per mile. Pay Your Pal data indicate that the average cost per trip to Ukiah was $15.70 and the average cost per trip to Santa Rosa was $20.26. This is significantly less than the Medi-Links program.

For this reason, Lake Links is in the process of starting a new volunteer driver program called Ride Links. Lake Links will recruit volunteers to drive qualified passengers to medical appointments in the volunteer's insured vehicle. Volunteers would need to go through a background check process. Before the program can be implemented, Lake Links needs to acquire supplemental insurance for the agency. This program will be beneficial for qualified passengers who do not have a friend or family member to drive them to their appointment. Finding appropriate insurance is proving to be challenging, but once active, the program will provide a more cost-effective method of non-emergency medical service than the Medi-Links program. Eventually, Lake Links would also acquire one to two vehicles for volunteers to use.

The most recent round of FTA 5310 grant applications redefined the roles of LTA and Lake Links in funding various trip purposes. LTA is now responsible for paying for all NEMT trips provided by either Lake Transit or Lake Links. Lake Links will be responsible for paying for all non-medical trips provided through the volunteer driver program or the Pay Your Pal program. Pay Your Pal is still a great option for destinations not served by LTA or served infrequently, especially as it can now be used for other essential trips such as shopping, banking, etc. In the future, Lake Links could consider raising their reimbursement rate to the IRS reimbursement rate of $0.62 per mile to keep pace with rising gas prices.

Chapter 3
CAPITAL ALTERNATIVES

This chapter describes potential projects and alternatives related to the capital needs for the transit system. Capital includes vehicles and their associated technology, bus stops, and maintenance/storage facilities. Marketing strategies are also discussed towards the end of the chapter.

VEHICLE REPLACEMENT

A transit agency needs a vehicle fleet that is safe and appropriate for the services it provides. As discussed in Tech Memo 1, LTA has a fleet of 33 vehicles, 28 of which are active. These vehicles range in size from small vans used for paratransit services to full-size buses used for the fixed routes. Lake Transit will need to replace nearly its entire fleet over the next ten years (Table 5).

The State of California's Innovative Clean Transit (ICT) Regulation will go into effect during the current planning period. Beginning in 2026, the ICT regulation will require 25 percent of small fleet bus purchases to be zero-emissions buses (ZEBs). By 2029, this requirement will increase to 100 percent. To receive an exemption from the ICT regulation, LTA must demonstrate one of the following applies: there was an uncontrollable delay in construction of its ZEB infrastructure, current ZEB buses available on the market cannot meet daily mileage needs, or current ZEB buses do not have adequate gradeability performance. LTA will likely qualify for one of these exemptions because of the high number of daily service miles and mountainous terrain covered by many of the fixed route buses. ZEBs are much more expensive than gas- or diesel-powered buses (as seen in Table 5), therefore the ICT regulation also offers a financial exemption if transit agencies can demonstrate that purchasing ZEBs is not financially feasible. The ICT regulation only applies to vehicles that weigh over 14,000 pounds.

Table 5 shows the estimated costs of replacing LTA's fleet of vehicles during the next ten years under the assumption that LTA does *not* apply for or receive an exemption from the ICT regulation. In this scenario, LTA would need to purchase two ZEBs, one full-size bus and one DAR vehicle, in this planning period (which ends in FY 2027-28). LTA would then need to purchase twelve ZEBs in total between FY 2026-27 and FY 2031-32. Overall, given current prices and expected inflation, LTA would need to spend approximately $9.7 million in the next decade to meet its vehicle replacement needs (Table 5). If LTA purchases hydrogen-fueled buses, the agency should expect to spend even more on new vehicles.

Table 5: Fleet Replacement Requirements

Fiscal Year[2]	Fixed Route Vehicles				Dial-A-Ride Vehicles				Total Cost of Vehicle Needs
	Number of Vehicles			Subtotal of Cost	Number of Vehicles			Subtotal of Cost	
	Gas/Diesel Vehicles	Electric Vehicles	Total		Gas/Diesel Vehicles	Electric Vehicles	Total		
22/23	5	0	5	*$1,050,000*	0	0	0	*$0*	*$1,050,000*
23/24	5	0	5	*$1,081,500*	1	0	1	*$88,700*	*$1,170,200*
24/25	5	0	5	*$1,113,900*	0	0	0	*$0*	*$1,113,900*
25/26	0	0	0	*$0*	2	0	2	*$188,200*	*$188,200*
26/27	1	1	2	*$827,200*	0	0	0	*$0*	*$827,200*
27/28	3	0	3	*$730,300*	0	1	1	*$243,400*	*$973,700*
28/29	0	1	1	*$626,900*	0	0	0	*$0*	*$626,900*
29/30	0	1	1	*$645,700*	0	4	4	*$1,033,100*	*$1,678,800*
30/31	0	0	0	*$0*	0	0	0	*$0*	*$0*
31/32	0	3	3	*$2,055,000*	0	0	0	*$0*	*$2,055,000*
Total	**19**	**6**	**25**	**$8,130,500**	**3**	**5**	**8**	**$1,553,400**	**$9,683,900**

Estimated Current Cost of Vehicles	Fixed Route Vehicles		Dial-A-Ride Vehicles	
	Gas/Diesel	Electric	Gas/Diesel	Electric
	$200,000	$500,000	$82,000	$200,000

Note 1: All costs include 5.0 percent annual inflation in 2022/23, and 3.0 percent thereafter.
Note 2: By 2026, 25% of LTA new vehicle purchases are required to be zero emission. By 2029, this increases to 100%.
Source: LSC Transportation Consultants, Inc.

While it is likely LTA will be exempted from the ICT Regulation when it first goes into effect, LTA still needs to begin planning its ZEB rollout, including what type of vehicles will be purchased and where charging infrastructure will need to be constructed. It is possible to apply for FTA 5311, FTA 5339 or FTA 5339(c)Low or No Emission Vehicle Program funding to both purchase ZEBs and to modify facilities to accommodate charging infrastructure. Lake Transit has already secured funding for four hydrogen-fueled buses and associated charging infrastructure through its Lake Transit Interregional Transit Center grant application, described below.

Additional Vehicles for Service Alternatives

Only one of the service alternatives discussed in Chapter 2 would require Lake Transit to operate an additional vehicle: increasing the frequency of Route 1. Lake Transit's current fleet size is more than large enough to operate the existing services, meaning that if the service frequency on Route 1 were to be increased, Lake Transit already has enough buses to operate the expanded service. However, using an additional bus to serve Route 1 more frequently would lower the number of back-up buses available when other buses need to undergo maintenance.

If Lake Transit officially increases the service frequency on Route 1, then Lake Transit would likely need to purchase an additional new bus within the next five years in order to ensure its fleet has the capacity to operate all transit services, even when there are unexpected issues with vehicles. Purchasing a full-size bus would cost approximately $200,000, or more depending on inflation in upcoming years (Table 5). LTA would also need to consider the ICT Regulation (discussed in the previous section) if they procure the additional bus after January 2026. However, Lake Transit would only need to purchase a smaller microtransit van if Route 8 is also replaced with microtransit in

addition to Route 1's frequency being increased, as the full-sized buses used for Route 8 would then be available to operate Route 1.

AUTOMATIC PASSENGER COUNTERS

On-board technology can collect transit operations data in real time and generate useful summary reports, eliminating the need to record data manually and reducing the potential for error. Although there is always a measurable cost up front when purchasing new technology, LTA could use the data collected by Automatic Passenger Counters (APCs) to greatly assist with transit planning.

APCs are devices which collect detailed boarding information by either recording or sensing passengers as they board and disembark from the bus. For APCs that use video, counting software detects how many people are entering and exiting in the video of the bus doorways, generating boarding and alighting counts. For the APCs that use infrared beams, the units are installed so an infrared beam goes across the doorway and then software detects when someone boards or alights and breaks the beam. The count data generated by each system is then sent via the internet to generate a live report. APCs can be integrated with the onboard GPS to develop a map of boardings and alightings. Top models of APCs count 98 percent of boardings and alightings accurately, which is a vast improvement over the 85 percent accuracy, on average, of human-recorded boarding data.

Companies that manufacture both the hardware and software for bus APCs include Connexionz, DILAX Systems Inc., Passio, and TripSpark, among many others. There are also some vendors which make either just the hardware or just the software. It is recommended that LTA develop a Request for Proposals (RFP) to select a vendor to install the APCs and to integrate the devices with the existing hardware/software already being used on Lake Transit buses. Prices can vary greatly depending on the vendor and the size of the transit fleet; costs to purchase and install APC hardware have been cited to range from $4,000 to $10,000 per bus. Annual maintenance costs for the APCs have been quoted as ranging from a few hundred to a few thousand dollars per year. Software is estimated to cost between $100,000 to $250,000 to install, and then between $1,000 to $5,000 annually.

ELECTRONIC FARE PAYMENT SYSTEMS

Currently, each LTA bus is equipped with a farebox. At the end of the day, the driver removes the farebox from the bus and places it in the vault room, which is monitored by cameras and a security system. Two staff members then go through the fareboxes to count the cash fares. Paratransit Services, Inc., deposits the cash fares and deducts the total from the monthly invoice sent to LTA.

LTA's current system is limited in that passengers can only pay with cash onboard. There is also the issue that the current fare reconciliation process can be affected by human error. Electronic fareboxes address both of these issues, collecting both cash and digital payments and providing data that can be exported into reports for LTA. Similar to the recommended procurement process for APCs, if LTA is interested in upgrading to electronic fareboxes it is recommended that LTA develop an RFP to select a vendor for the needed hardware and software.

Examples of electronic payment systems that accept both cash and card payments are the Aries 5 Farebox by Payment in Motion and the Fast Fare® Farebox by Genfare. Prices once again can vary greatly depending on the vendor or the contract, however new fareboxes have often been cited to cost between $12,000 and $18,000 each, excluding annual software costs. Annual maintenance costs would be similar to those for APCs, ranging from a few hundred to a few thousand dollars. It would be important to get electronic payment systems that integrate with LTA's existing onboard technology.

LAKE COUNTY INTERREGIONAL TRANSIT CENTER

The 2015 TDP identified the need for a new transit center in Clearlake as a high priority capital project that should be initiated as soon as possible. Since 2015, Lake Transit has made major headway towards constructing a new transit center. First, the Lake APC was selected for a Caltrans Sustainable Transportation Planning Grant, which was used to fund the Transit Hub Location Plan (2017). This plan identified the preferred location for the new transit center (the intersection of South Center Drive and Dam Road Extension in Clearlake) as well as potential funding sources. The information presented in the Transit Hub Location Plan was then used to develop Lake Transit's successful 2020 Transit and Intercity Rail Capital Program (TIRCP) grant application.

LTA plans on using the funds received from the TIRCP grant (almost $13 million) to construct the new transit center, purchase four fuel cell electric buses (powered by hydrogen) and the needed fueling/maintenance infrastructure, and support local workforce development. The new transit center will also be a part of the greater North State Intercity Bus System network, a project that will enhance regional connectivity in northern California. The hydrogen bus fueling and maintenance infrastructure will be installed at LTA's Lower Lake Yard, only 1.5 miles from the proposed lot for the transit center. Some of the important design features of the future transit center site are eight bus bays, six of which will be oriented in a "sawtooth" pattern, three electric bus charging bays, a parking lot for commuters with electric vehicle charging stations, and the transit center itself, with offices, bathrooms, and a waiting area for passengers. The transit center will have bike lockers, a breezeway with seating, and solar panels.

Lake Transit hired GHD, Inc., in September 2021 to begin analyzing the project's potential environmental impacts to determine compliance with the California Environmental Quality Act (CEQA). Based on the results of GHD's analysis, Lake Transit developed an Initial Study and Mitigated Negative Declaration (IS/MND) that was available for the public to review and provide comments on from August 8 to September 8, 2022. The LTA board approved the recommended IS/MND and associated Mitigation Monitoring and Reporting Program at their meeting on September 14, 2022. LTA will now be able to proceed with the design stage of the project and will soon be releasing an RFP for architectural and design services for the new transit center and the fueling infrastructure at the Lower Lake Yard.

Once Lake Transit selects a firm through the RFP process, next steps will include procuring a contractor to take on construction, procuring the new hydrogen buses, contributing to the Automotive Technology Program at Mendocino College, and a marketing campaign to advertise the

new transit center. LTA already has a performance monitoring program identified as well. In the future, the new transit center may require LTA to adjust the fixed route schedules slightly. The process of designing and constructing the new transit center in Clearlake and procuring/deploying the new hydrogen buses will be an ongoing process that will hopefully be completed during the current planning period, significantly upgrading LTA's current capital infrastructure.

Source: LTA TIRCP Application

PASSENGER AMENITY IMPROVEMENTS

As discussed in the "Passenger Amenities" section of Chapter 4 of Tech Memo 1, passengers have often requested more and improved amenities at Lake Transit bus stops. The *Bus Passenger Facilities Plan* (2019) included an inventory of existing LTA stops, the amenities at each stop, and the state of these amenities. The plan also identified design standards that should be used when planning bus stop improvements. Overall, it was recommended that LTA focus on upgrading bus stops with high ridership and few existing amenities.

Lake Transit has already begun replacing signposts and installing new bus stops shelters at locations recommended by the *Bus Passenger Facilities Plan*. Lake Transit also completed a new bus turnout and bus stop upgrades at Austin Park. The new Lake County Interregional Transit Center, which is expected to be completed during this planning period, will also greatly improve the experience of LTA passengers traveling through Clearlake and replace the existing stop at Walmart, which was identified as being a high priority stop for improvements. Based on the bus stop inventory in the *Bus Passenger Facilities Plan,* stops that have or are already being worked on, and the boarding and alighting counts conducted in May 2022, stops that should be prioritized for upgrades (excluding bus pullouts) include Sutter Lakeside Hospital, Robinson's Rancheria Casino, Burns Valley Mall, and the Veteran's Clinic in Clearlake.

During the next five years, it is recommended that Lake Transit continue to upgrade bus stops based on the criteria described in the *Bus Passenger Facilities Plan* (improve stops with high ridership and poor amenities). Although LTA will have to allocate a large amount of funding for bus procurement and the new transit center during this planning period, additional capital funding should be used for passenger amenity improvements. Potential funding sources are as follows: FTA 5310 funds, FTA 5311 funds, FTA 5339 funds, Community Development Block Grants, TDA funding, the State of California Road Repair and Accountability Act, and Low Carbon Transit Operations Program (LCTOP) funds.

MARKETING IMPROVEMENTS

Marketing is an important component behind any transit agency's success. Lake Transit's current marketing materials were summarized in Chapter 4 of Tech Memo 1. The 2015 TDP presented an extensive list of marketing strategies and improvements, many of which have been implemented in the years since the plan was approved. This section presents a brief list of potential marketing improvements, summarized in Table 6, that build on the strategies included in the 2015 TDP and could ultimately improve communications with both current passengers and potential new riders.

Physical Presence

One of the most basic, yet important, ways to increase public awareness of the transit system is to increase the physical presence of the transit agency on the streets of the community. This is done first by designing vehicles to showcase the logo and coloring of the transit agency. While the Lake Transit vehicles are different colors (some are white, purple, and others have a fuchsia accent), all of the vehicles have the Lake Transit logo on the side as a central graphic. The logo is not the same on each bus, as the design has evolved over time. As LTA procures new buses in upcoming years, staff should make sure buses have similar branding by establishing a consistent design.

Table 6: Marketing Strategies and Improvements

Strategy/Improvement	Cost per Unit	Quantity		Total Cost
Improve Existing Bus Stop Signage and Install New Signs				
New Bus Stop Sign Panels	$115	141	panels	$16,215
New Bus Stop Sign Poles	$230	149	poles	$34,270
Replacement Sign Panels	$230	8	panels	$1,840
Replacement Sign Poles	$345	5	poles	$1,725
Repairs for Sign Poles	$115	58	repairs	$6,670
Subtotal	--	--	--	*$60,720*
Print Materials[1]	--	--	--	*$12,840*
Phone Materials				
Automated Text Message Service Plan (Annual)	$24	12	months	*$292*
Social Media				
Facebook Advertising Campaign (Annual)	$250	1	campaign	$250
Begin an Instagram Account	--	1	acct.	$0
Subtotal	--	--	--	*$250*
Outreach Events				
Staff[2]	$742.86	5	days	$3,714
Transportation Expenses	$115	5	days	$575
Event Fees	$50	3	events	$150
Subtotal	--	--	--	*$4,439*

Sources: The Bus Stop Facilities Plan (2019), LTA Budget FY 22-23, Lake APC staff
Note 1: The cost for print materials was estimated based on the FY 22-23 budget and expected inflation.
Note 2: The price for staff is a rough estimate that assumes one staff member working 10 hours per day.

The next way to increase the physical presence of the transit agency is to install bus stop signs. Bus stop signs are important, as they advertise to both riders and non-riders alike where bus stops are located, helping facilitate trip planning and encourage people to use the bus. The *Bus Passenger Facilities Plan* (2019) found that half of Lake Transit's stops had a sign, but it was recommended that signs be installed at every active stop. Table 6 shows the estimated costs for installing, replacing, or repairing signs at the bus stops identified during the study process as not having adequate signage. The total cost for ensuring all LTA stops have appropriate signage would be $60,780 (based on the 2019 study estimates, increased by 15 percent to reflect inflation). This does not consider the signs that have already been fixed in the years since the *Bus Passenger Facilities Plan* was completed. With the understanding that all of the identified signage improvements may not be possible due to financial constraints and legal issues related to right-of-way, it is still recommended that LTA continue to work on improving signage across its inventory of bus stops throughout the current TDP planning

period. As recommended in the 2015 TDP, new bus stop signs should be designed to show information about which routes serve the stop.

Lastly, as discussed earlier in this Chapter, Lake Transit is expected to complete the new Lake County Interregional Transit Center during this planning period. LTA should conduct an extensive marketing campaign to celebrate the project's completion. LTA already included this marketing campaign as a component of its successful TIRCP grant application. The opening of the new transit center will be an important and exciting event that will also likely result in some service changes; therefore, Lake Transit should begin planning and implementing this campaign well before the transit center is completed.

Source: LSC Transportation Consultants, Inc.

Online Materials

The Lake Transit website is well developed and contains a large amount of information. One website improvement that was recommended in the 2015 TDP and since has been implemented is the addition of a Trip Planner tool on the bottom of the website, allowing people to look up their trip on Google Maps right from the LTA website.

Recommended changes to the LTA website are intended to ensure the website is as informative and up to date as possible. The website should be checked to make sure there are no references to old schedules or programs implemented during recent years. There should be a prominent news bulletin when a new schedule is released on the home page of the website. Moving the existing orange call out box to see Lake Transit news to the top of home page of the website would help remind residents to check the transit news more than just the current side bar notifications. All Lake Transit social media (discussed further below) should be linked on the Lake Transit website, either at the bottom of the website or from the "Contact Us" page, which could have a header called "Connect".

Print Materials

Following the recommendation made in the 2015 TDP, Lake Transit has resumed printing a comprehensive rider's guide that contains information on all of the transit services. The rider's guide is incredibly informative, containing route maps, schedules, regional maps, fare polices, transfer policies, and holiday information. As previously discussed, LTA service offerings have changed multiple times during recent years due to COVID-19 and staffing shortages. Now that the effects of the pandemic have more or less stayed steady and staffing has become more consistent, it is recommended that Lake Transit update its rider's guide and all printable schedules available on the website to reflect anticipated service levels for FY 2023-24. It is possible that the final 2023 TDP update will result in further service changes, therefore, these materials should not be updated until the 2023 TDP update is approved. Updating these materials before the beginning of the next FY will help to eliminate confusion about current service offerings. LTA already sets aside funds for printing each year.

Phone Information

Lake Transit helps residents over the phone by providing information, assistance with trip planning, or for scheduling flex stops or DAR reservations. Lake Transit also has Spanish resources available via phone, as well as a number for people to call if they need assistance in any other language. There are no recommended changes to LTA's existing phone resources.

Many transit agencies offer text alert systems for passengers. If passengers accept potential charges from their own phone carrier, they are able to subscribe to a service managed by the transit agency that will send automated text messages regarding any immediate service changes that may impact the passenger's travels, an example being a re-route due to wildfire hazards. Automated text messages can also be sent to promote transit news, such as the anticipated return of Saturday service on Routes 3 and 7. Costs for these services range depending on the number of texts sent per month and the amount of people receiving messages. As LTA would likely only use this text service for pertinent information, it would be recommended that LTA start with a small plan size. Table 6 shows the estimated cost of an automated text message service that would send 500 messages per month, in which the estimated annual cost of $292 is based on a monthly cost of $24.33. These values were determined based on researching companies that provide automated text services, such as SimpleTexting, SlickText, and Mobile Text Alerts.

Social Media

Social media has emerged as a powerful tool for communicating transit information to passengers, stakeholders, and the greater public. Lake Transit has a Facebook account with 182 followers that is used to share information about service changes, schedule updates, public outreach, and ridership campaigns, among other news. LTA should continue to utilize Facebook as a way to promote the transit agency and share information with riders. Some transit agencies use Facebook advertising to reach people who are on the platform but maybe unfamiliar with the transit system. LTA could utilize Facebook advertising to increase awareness of the transit system, or to advertise specific news such as job opportunities. These campaigns should be done outside of the "holiday season" months of

November and December when Facebook is flooded with advertisements. If Lake Transit even budgeted $250 for Facebook advertisements annually (Table 6), the transit agency would likely reach a significant number of people on the platform.

Lake Transit does not use any other form of social media. Studies have found that members of Generation Z (those born after 1996) are less likely to have Facebook compared to other social media; a 2022 study by the Pew Research Center found that only 32 percent of teenagers used Facebook compared to 95 percent who use YouTube, 67 percent who use TikTok, 62 percent who use Instagram, and 59 percent who use Snapchat. To reach younger audiences, LTA should consider establishing an account on one of those platforms. An Instagram account would be the next easiest form of social media to adopt because LTA could post the same materials to both its Facebook and Instagram accounts (pictures and short videos) rather than having to edit videos specifically for YouTube or TikTok.

Outreach Activities and Events

Now that pandemic restrictions have been lifted and in-person events are being held again, LTA has the opportunity to conduct in person public outreach at community events. Attending community events is an excellent way to meet people who represent new potential riders. For instance, Lake Transit joined the Lake APC at the Lake County Fair, an event attended by thousands of people, in September 2022 to share information about the transit services and to gather input for the 2023 TDP Update.

Attending community events, such as the fair or Lakeport Concerts in the Park, would be valuable in the upcoming year to remind residents who were more travel restricted during the pandemic about the available transit services. These events could also serve as opportunities to reach people who are financially feeling the pressure of rising costs and would be interested in riding the bus, but who are unfamiliar with LTA and don't know how to use public transit. While attending community events is not a cheap marketing strategy, as there needs to be a budget for staff, print materials, and likely a fee for entrance into the event and booth space, it is more cost efficient to attend a larger event rather than plan an event sponsored by the transit agency itself. If LTA attended three community events a year (approximately five to six days-worth of time), it is expected to cost around $4,400 to $5,000 annually (Table 6). This estimate is based on Lake APC's expenses for staffing the booth at the Lake County Fair.

Lake Transit should also take advantage of its stakeholder relationships by developing targeted marketing information and having stakeholders distribute the materials to their clientele themselves. An example would be targeting senior adults with the help of contacts at local senior centers. Senior adults are frequent transit riders but are less likely to learn about transit news through technology or social media (however, it is worth noting that senior adults in 2022 are much more tech savvy compared to ten years ago). Lake Transit could reach more senior adults by providing informational materials to the various senior centers across the county (Clearlake, Lakeport, Kelseyville, Upper Lake) for staff to distribute at senior center events. This would not require much additional LTA staff time but would help inform senior residents across Lake County about the transit system.

Chapter 4

MANAGEMENT AND FINANCIAL ALTERNATIVES

In this chapter, alternatives related to the overall management of the LTA and fare structure are discussed.

MANAGEMENT ALTERNATIVES

The LTA organizational structure was discussed in depth in Chapter 4 of Tech Memo 1. In summary, the LTA Board of Directors makes policy decisions for the transit agency. The LTA transit manager manages operations, and Paratransit Services, Inc., actually operates the transit services under contract with the LTA. There are no recommended changes to the existing Lake Transit management structure, and therefore no management alternatives to consider at this time.

FINANCIAL ALTERNATIVES

Fare Structure

LTA receives funding from federal, state, and local sources. One of the primary sources of local funding are fares. During the COVID-19 pandemic, Lake Transit used some of its CARES Act and CRRSAA funding to provide free fares to passengers using the bus services. The pre-pandemic fare structure was reinstated during FY 2021-22 and is shown in Table 8 of Tech Memo 1.

Table 7 compares LTA's fares to those of other small to medium size transit systems in the State of California by analyzing the fares and pass options for similar length routes. Some of the important takeaways from the table include:

- Lake Transit's base fare for Route 1 between Clearlake and Lakeport, $2.25, is below the peer average of $2.90, but only slightly.
- Lake Transit's in-town base fare is near the average of the transit systems considered ($1.50 versus the average $1.78).
- Four of the transit systems considered offer monthly passes for passengers, however these passes range greatly in cost ($30 to $120).
- The base fare per route mile is useful when considering routes of different lengths to determine whether the fare is appropriate for the service. As seen in Table 7, the base fare per route mile for Route 1 is $0.06, which is lower than the average across the five systems of $0.10.

Overall, the peer fares analysis supports that LTA's fares are in line with other transit systems operating in similar service areas. LTA's fares are slightly below the peer averages across the various categories. Even though Lake Transit's fares are cheaper than some of its peers, the fares are also appropriate for the Lake County population; a greater proportion of Lake County residents live below the poverty line compared to the State of California as a whole. According to on-board surveys, 86

percent of survey participants did not have a vehicle available to them, suggesting that raising fares may negatively impact those who rely on the transit system.

In conclusion, there are no recommended changes to the overall LTA fare structure. LTA fares are comparable to other transit agencies and appropriate considering local passenger demographics. Lake Transit's farebox ratio was also 10.2 percent in FY 2021-22, meeting the TDA farebox ratio requirement and justifying that no fare increases are merited at this time.

Table 7: Peer Transit System Fares Analysis

Transit Program	LTA	STAGE (Siskiyou)	KART (Kings)	Yuba Sutter Transit	Amador Transit	
Service Area - Route	Clearlake to Lakeport (Route 1)	Yreka to Mount Shasta	Hanford to Visalia	Susanville to Doyle	Sutter Creek to Amador Station	**Average**
Fare Structure						
Base Fare - One Way	$2.25	$4.00	$1.75	$3.00	$3.50	**$2.90**
Discount - One Way	$1.50	$2.75	$0.85	$1.50	$2.00	**$1.78**
In-Town Fare	$1.25	$1.75	$1.25	$1.50	$1.00	**$1.35**
Discount - In-Town Fare	$0.75	$1.25	$0.60	$0.75	--	**$0.84**
Monthly Pass	$40.00	--	$60.00	$30.00[1]	$120.00	**$73.33**
Monthly Pass Discount	--	--	$50.00	$15.00[1]	$80.00	**$65.00**
Operating Statistics						
One-way Route Mileage	37	37	21	32	25	**30**
Base Fare per Route Mile	$0.06	$0.11	$0.08	$0.09	$0.14	**$0.10**

Source: LSC Transportation Consultants, Inc.
Note 1: Yuba Sutter Transit is offering monthly passes for $10 and for $5 for discount-eligible passengers until June 2024.

New Monthly Pass for Entire LTA System

Lake County offers three forms of passes. The first is a punch pass that is equal to $11.00 worth of fares. Passengers can use this pass on any LTA service as long as the pass has credit on it. The other two passes are both good for an unlimited number of rides while the pass is active: the Monthly Fast Pass and the System Weekly Pass. The Monthly Fast Pass can be used on LTA routes that operate entirely within Lake County, while the System Weekly Pass can be used on LTA routes in Lake, Napa, and Mendocino Counties. The Monthly Fast Pass costs $40 and the System Weekly Pass costs $20.

It would be convenient for passengers who frequently ride Routes 3 and 7 to either Napa or Mendocino Counties to have a monthly pass option. LTA could begin offering a product called the Monthly Systemwide Fast Pass to address this issue. The Monthly Systemwide Fast Pass would provide passengers with unlimited rides for one month on every LTA service, both intra- and inter-county. Because some months are technically longer than 4 weeks, this pass could be priced at $90 (4.5 times the System Weekly Pass). While it is not expected that adding this price product would affect LTA revenues in any significant way, a Monthly Systemwide Fast Pass would improve the experience of those passengers who frequently use the intercounty services by minimizing the number of times they need to purchase pass products.