



**TRANSPORTATION PLANNING AND
TRAFFIC ENGINEERING CONSULTANTS**

2690 Lake Forest Road, Suite C
Post Office Box 5875
Tahoe City, California 96145
(530) 583-4053 FAX: (530) 583-5966
info@lsctahoe.com • www.lsctrans.com

MEMORANDUM

DATE: November 21, 2014

TO: Andy Newsum, Butte County Association of Governments

FROM: Kristina Svensk, AICP and Gordon Shaw, PE, AICP

SUBJECT: Butte County Commuter Bus Recommended Service Plan

This memorandum presents the recommended plan for commuter-oriented transit service between Chico and Sacramento, via Oroville and Marysville. It builds upon the two technical memoranda developed in the course of our study, which are provided as Attachments A and B.

Following an examination of the existing conditions of transit service and potential needs / demand for commuter service (Attachment A), a number of service alternatives were evaluated (Attachment B). Based on a detailed analysis of the alternatives, a recommended plan was developed and is presented in this memo. The plan focuses on one refined service option, and presents all relevant details including operating characteristics, financial characteristics, and capital requirements for a three-year plan period. The first portion of this memo presents a brief overview of the alternatives that were evaluated, while the second portion presents the recommended plan.

SUMMARY OF ALTERNATIVES

A total of five individual service elements were initially reviewed during the study, in addition to two service packages that combined various elements. Table 1, below, summarizes the service elements, including cost, ridership, and revenue estimates. Detailed analysis of these alternatives can be found in Attachment B: *Technical Memorandum Two*.

Individual Service Elements

The following service elements were first considered individually:

- **Chico – Oroville – Marysville – Sacramento:** This service would provide two morning and two afternoon runs between Chico and Sacramento, with stops in Oroville
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TABLE 1: Butte County - Sacramento Commuter Transit Service Alternatives

	Daily Service Quantities			Annual Service Quantities			Daily Ridership (1-Way Passenger-Trips) (2)		Annual Ridership (1-Way Passenger-Trips) (2)		Annual Farebox Revenue (2)	Annual Operating Subsidy			
	In-Service Vehicle-Hours	Driver Deadhead Hours	In-Service Vehicle-Miles	Days per Year	In-Service Vehicle-Hours	Driver Deadhead Hours	In-Service Vehicle-Miles	Sacramento	Marysville/Yuba City	Total			Sacramento	Marysville/Yuba City	Total
Individual Service Elements															
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs	12.10	5.53	564	254	3,073	1,405	143,256	77	2	79	19,600	500	20,100	\$149,000	\$230,000
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs	11.50	5.33	540	254	2,921	1,355	137,160	76	3	79	19,300	800	20,100	\$148,000	\$214,000
Add Mid-day round-trip Chico-Oroville – Marysville to connect with YST service	2.37	0.00	104	254	601	0	26,416	22	2	24	5,600	500	6,100	\$23,000	\$44,000
Add Mid-day round-trip Chico-Gridley-Marysville to connect with YST service	2.33	0.00	98	254	593	0	24,892	19	4	23	4,900	1,000	5,900	\$22,000	\$43,000
Extend One Mid-Day B-Line Route 20 Run from Oroville to Marysville to connect with YST service	1.23	0.00	64	254	313	0	16,256	22	2	24	5,600	500	6,100	\$23,000	\$15,000
Overall Service Scenarios															
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	13.33	5.53	628	3,386	1,405	159,512	\$417,000	99	4	103	25,200	1,000	26,200	\$172,000	\$245,000
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	12.73	5.33	604	3,234	1,355	153,416	\$400,000	98	5	103	24,900	1,300	26,200	\$171,000	\$229,000
Note 1: Applying forecasted FY 2013-14 cost factors. Note 2: Reflecting full potential ridership, not typically achieved until the third year of a new transit service.															

and Marysville. The route would operate down SR 70 to Marysville, and follow SR 70 / SR 99 to downtown Sacramento. Service would begin at the existing park-and-ride lot in Chico on Fir Street and would stop at an additional new park-and-ride location before heading south to Oroville. Once in Oroville, a stop would be made at the existing park-and-ride located at the intersection of 3rd Street and Grand Street, adjacent to the highway. A stop in Marysville at the Caltrans District 3 office would be made before continuing on to Sacramento. Under this alternative, the vehicle from the first morning run would “layover” in Sacramento until the first afternoon run back to downtown from Chico; the driver would return to Chico via the second morning run, which would provide service from Sacramento to Chico for any reverse commuters (or persons needing to travel to Marysville, Oroville or Chico).

- **Chico – Gridley – Yuba City – Sacramento:** This alternative is identical to the previous alternative, except that the route operates along the SR 99 corridor through Durham, Gridley and Yuba City rather than the SR 70 corridor. Under this alternative, the travel time would be slightly longer than the Oroville – Marysville option, despite the shorter route. This service would also begin at the Fir Street park-and-ride lot in Chico, followed by a new stop location before traveling to Gridley on SR 99. A new park-and-ride would likely have to be established for the bus stop in Gridley, preferable at the intersection of SR 99 and SR 142 (Oroville Dam Boulevard). From Gridley, the bus would stop at the Caltrans office in Marysville, followed by designated stops in downtown Sacramento. As with the previous alternative, the driver of the first bus would store the vehicle in Sacramento and return to Chico with the second morning bus, before returning the Sacramento for the Chico-bound afternoon runs.
- **Add Mid-day Round-Trip Chico – Oroville – Marysville:** This alternative component was based upon peer commuter systems operating in Sacramento, whose data suggested that providing a mid-day service would benefit overall service quality and ridership. Benefits include the ability to work flexible hours (i.e. half-day), emergency ride home opportunities, and higher potential for non-commuter ridership. Under this alternative, B-Line would operate a single mid-day run between Chico and Marysville via Oroville. The Marysville stop would be located at the Yuba County Government Center, and transfers to Yuba/Sutter Transit services would be available to passengers, including routes to Sacramento.
- **Add Mid-day Round-Trip Chico – Gridley – Marysville:** As with the previous alternative, this option would provide a mid-day run operated by B-Line between Chico and Marysville, with a stop in Gridley on the way. The Marysville stop would be consistent with the previous alternative, and would also be timed to allow for transfers to Yuba/Sutter Transit routes.
- **Extend One Mid-Day B-Line Route 20 Run from Oroville – Marysville:** Rather than operating a new mid-day run from Chico to Marysville, another less costly option would be to operate a single daily run between Oroville and Marysville, as an extension of Route 20. Due to potential coordination issues depending on direction, either an existing Route 20 run would need to be modified or an additional southbound run

added. Either of these would help to avoid a long wait and transfer in Oroville in the southbound direction, which would impact the convenience of the service and the ability to transfer in Marysville. As this option was found to be significantly more cost effective than duplicating service between Chico and Oroville, this option was used for the service scenarios discussed below.

Overall Service Scenarios

The selected individual service elements were then evaluated as part of the following comprehensive scenarios:

- **Chico – Oroville – Marysville – Sacramento with Mid-Day Route 20 Service:** This service scenario combines the Chico to Sacramento service, via Oroville / SR 70, with the Mid-Day Route 20 service element. Two runs would be operated in the AM period and two runs in the PM period, in addition to one mid-day run of existing Route 20 service that extends service to Marysville. Connections to Yuba / Sutter Transit would be available in Marysville for B-Line passengers.
- **Chico – Gridley – Yuba City – Sacramento Service with Mid-Day Route 20 Service:** This scenario would consist of two runs operated in the AM commute period and two runs in the PM commute period along the SR 99 corridor between Chico and Sacramento. Additionally, a mid-day run of existing Route 20 service between Chico and Oroville would be extended to Marysville to provide direct connections to Yuba/Sutter Transit. Passengers could connect with Yuba / Sutter Transit in Yuba City to routes serving Marysville, where transfers could be made to the B-Line Route 20 service.

Alternative Performance Measure Analysis

Table 2 presents an analysis of the various alternatives, for three key transit performance measures:

- **Passenger-trips per vehicle service-hour** is a key measure of service effectiveness. As indicated, the commute period alternative would carry 6.5 to 6.9 passenger-trips per vehicle service-hour. This figure is highest for the mid-day service extension of Route 20 to Marysville, at a net increase of 19.5 passenger-trips per additional hour operated.
- The **operating subsidy per passenger-trip** measures the cost efficiency of public transit funding. The commuter services would require \$10.65 to \$11.44 per passenger-trip. The mid-day services would be substantially more effective, as low as \$2.46 per passenger-trip for Route 20 extension to Marysville.
- The **farebox return ratio** is the ration of passenger fares (including monthly pass sales revenue) divided by the operating cost. It is the key measure required by the Transportation Development Act. This measure is calculated to be 39 to 41 percent for the commute-only alternatives, up to 61 percent for the incremental extension of Route 20 to Marysville. Note that these figures consider marginal operating costs only, and do not include any allocated fixed costs in the denominator.

TABLE 2: Service Alternatives Performance Measures

	Trips per Vehicle Service Hour	Subsidy per Passenger-Trip	Farebox Return Ratio
Individual Service Elements			
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs	6.5	\$11.44	39%
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs	6.9	\$10.65	41%
Add Mid-day round-trip Chico-Oroville – Marysville to connect with Yuba-Sutter Transit service	10.1	\$7.21	34%
Add Mid-day round-trip Chico-Gridley-Marysville to connect with Yuba-Sutter Transit service	9.9	\$7.29	34%
Extend One Mid-Day B-Line Route 20 Run from Oroville to Marysville to Connect with Yuba-Sutter Transit Service	19.5	\$2.46	61%
Overall Service Packages			
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	7.7	\$9.35	41%
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	8.1	\$8.74	43%
<i>Source: LSC Transportation Consultants, Inc., 2013</i>			

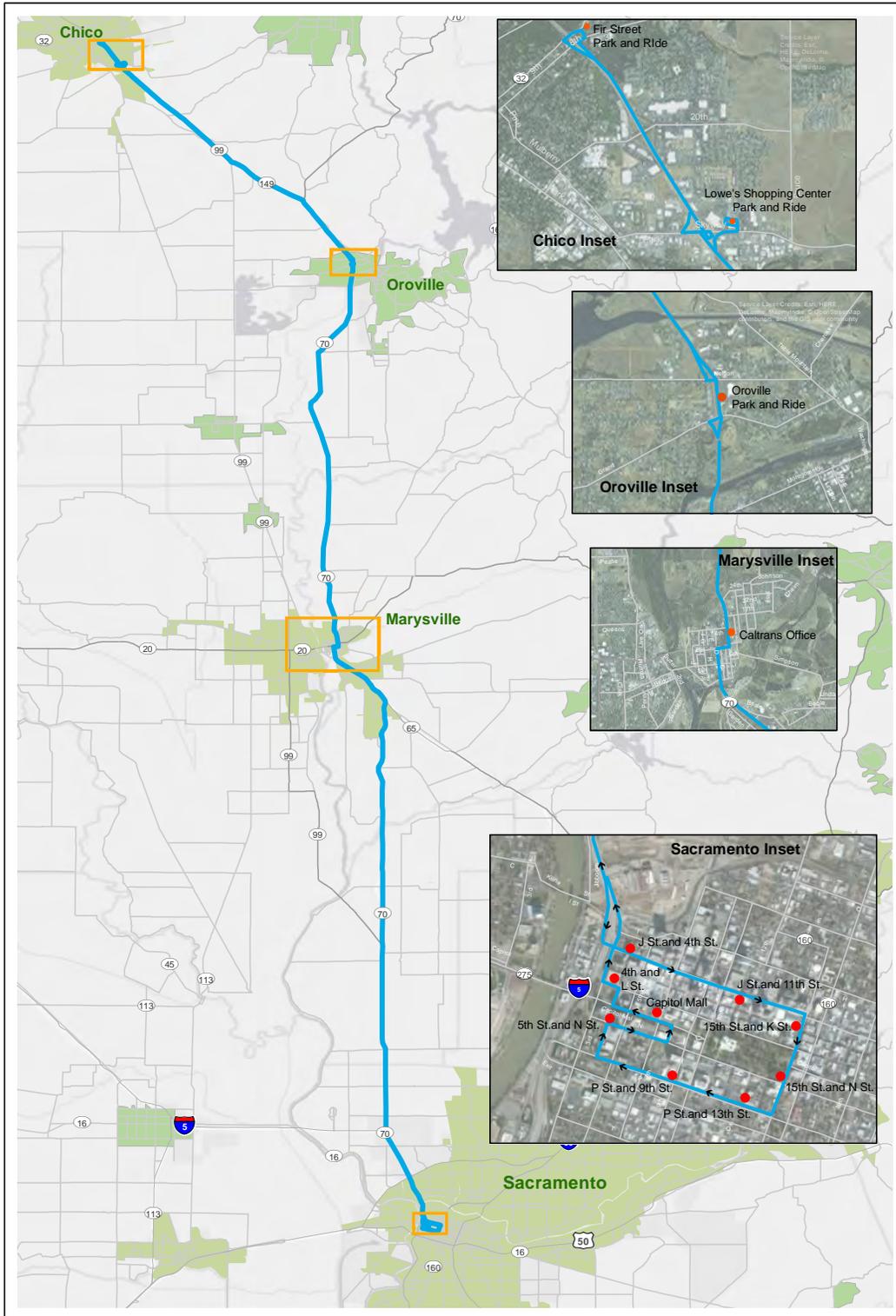
RECOMMENDED SERVICE PLAN

Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs

Based on the previous alternatives analysis, the recommended service plan for Butte County's commuter service is to operate two southbound runs for the morning commute period and two northbound runs in the evening commute period. While the mid-day connection to Marysville was found to provide benefits, it is not included in the initial plan due to limitations on operating funding. Details of this plan are as follows, and are shown graphically in Figure 1:

- Service will begin at the Fir Street Park-and-Ride Lot, and then head south on SR 70. This stop is served by B-Line Routes 5 and 20, providing the option of using local bus service.

Figure 1
 Chico-Oroville-Marysville-Sacramento Commuter Route



— Chico-Oroville-Marysville-Sacramento Commuter Route



- A second stop will be served at a new park-and-ride location at the Lowe's shopping center at the intersection of Forest Avenue and Skyway Blvd, before returning to SR 99 / SR 70 towards Oroville. B-Line Routes 5, 15, 20 and 40/41 also serve this area.
- A stop will be located in Oroville at the existing park-and-ride situated at the corner of 3rd Street and Grand Avenue. (This stop is also served by B-Line Routes 20 and 24, providing connection opportunities). The vehicle would exit SR 70 at Nelson Avenue, turn left onto Nelson Avenue, and turn right on 3rd Street, stopping at the park-and-ride lot. After, the bus would turn right on Grant Avenue to access southbound SR 70.
- The bus continues on SR 70 to Marysville, where it will stop at the Caltrans District 3 building, located on B Street between 7th Street and 9th Street. The existing stop at B Street and 9th Street used by Yuba/Sutter Transit (Route 4) would be utilized; after stopping, the vehicle would turn right onto 8th Street and left onto E Street/SR 70 south towards Sacramento.
- The bus would exit the highway in Sacramento to access J Street, where it would make two stops before turning onto 15th Street, followed by P Street, then up to L Street and back to the highway. Stops, as shown in Figure 1, are consistent with those served by Yuba/Sutter Transit and El Dorado Transit, among others. The specific stops consist of the following:
 - J Street and 4th Street
 - J Street and 11th Street
 - 15th Street and K Street
 - 15th Street and N Street
 - P Street and 13th Street
 - P Street and 9th Street
 - 5th Street and O Street
 - Capitol Mall between 7th and 8th Streets
 - 4th Street and L Street

Table 3 presents a reasonable service schedule to be used as guidance; the schedule should be finalized once stops and layover parking are negotiated and confirmed with Sacramento RT. Commute period schedule times are selected based upon the AM arrival times and PM departure times in Sacramento that generate the greatest ridership on existing commuter services. These times provide for an 8-hour to 9-hour work day in Sacramento.

As shown in the schedule, there are two morning runs into Sacramento, however only one bus returns to Chico. To reduce deadhead hours/miles associated with both vehicles returning after the morning runs, one vehicle will be stored in Sacramento until the afternoon return trips. After completing the first morning run, the driver would travel to a layover location for the vehicle. Sacramento RT currently provides this opportunity for other regional commuter transit services, such as El Dorado Transit. Currently, this location is near the Capital City Freeway, between Capitol Avenue and N Street. Should this location be approved for the B-Line vehicle, the driver could access a Sac RT transit route on N Street, where they could coordinate for a pick-up on the second Sacramento inbound B-Line bus (i.e. at the one of the P Street stops or at 5th St and N St.). The first driver would return to Chico on the second bus, which provides a run in the reverse direction. In the afternoon, the driver of the second run would ride down on the first afternoon run and would complete the last Chico-bound run.

TABLE 3: Recommended Schedule for Chico - Oroville - Marysville - Sacramento Service

Southbound				
Chico (Fir Street Park and Ride)	5:25 AM	5:55 AM	--	1:35 PM
Chico (Lowe's Parking Lot - Forest A	5:31 AM	6:01 AM		1:41 PM
Oroville (Park and Ride)	5:56 AM	6:26 AM	--	2:06 PM
Marysville (Caltrans)	6:28 AM	6:58 AM	--	2:38 PM
J St & 4th St	7:18 AM	7:48 AM	--	3:28 PM
J St & 11th St	7:21 AM	7:51 AM	--	3:31 PM
15th St & K St	7:24 AM	7:54 AM	--	3:34 PM
15th St & N St	7:27 AM	7:57 AM	--	3:37 PM
P St & 13th St	7:30 AM	8:00 AM	--	3:40 PM
P St & 9th St	7:33 AM	8:03 AM	--	3:43 PM
5th St & N St	7:35 AM	8:05 AM	--	3:45 PM
Capitol Mall	7:38 AM	8:08 AM	--	3:48 PM
4th St & L St	7:41 AM	8:11 AM	--	3:51 PM
Northbound				
J St & 4th St	8:25 AM	--	4:05 PM	4:35 PM
J St & 11th St	8:28 AM	--	4:08 PM	4:38 PM
15th St & K St	8:31 AM	--	4:11 PM	4:41 PM
15th St & N St	8:34 AM	--	4:14 PM	4:44 PM
P St & 13th St	8:37 AM	--	4:17 PM	4:47 PM
P St & 9th St	8:40 AM	--	4:20 PM	4:50 PM
5th St & N St	8:42 AM	--	4:22 PM	4:52 PM
Capitol Mall	8:45 AM	--	4:25 PM	4:55 PM
4th St & L St	8:48 AM	--	4:28 PM	4:58 PM
Marysville (Caltrans)	9:38 AM	--	5:18 PM	5:48 PM
Oroville (Park and Ride)	10:10 AM	--	5:50 PM	6:20 PM
Chico (Lowe's Parking Lot - Forest A	10:35 AM	--	6:15 PM	6:45 PM
Chico (Fir Street Park and Ride)	10:41 AM	--	6:21 PM	6:51 PM
<i>Source: LSC Transportation Consultants, Inc.</i>				

In total, this service would require 13.6 in-service vehicle-hours per day, and travel 569.4 vehicle-miles per day, as shown in Table 4. The second driver (not driving the off-direction run) would be paid for their travel time as well as the added wait time (over standard break time) in Sacramento. This totals 6.0 additional driver pay hours per day.

TABLE 4: Butte-Sacramento Commuter Service Base Operating Characteristics

	Daily	Annual
In-Service Vehicle Miles	569.4	144,628
In-Service Vehicle Hours	13.6	3,454
Driver Deadhead Hours	6.0	1,524
Ridership Estimate	79.0	20,100
Fare Revenue	--	\$149,000
Operating Cost	--	\$400,000
Operating Subsidy	--	\$251,000
PERFORMANCE ANALYSIS		
Passenger-Trips per Vehicle Service-Hour		5.82
Operating Subsidy per Passenger-Trip		\$12.49
Farebox Return Ratio		37%
<i>Source: LSC Transportation Consultants, Inc.</i>		

Service should be provided five days per week (Monday through Friday). Based upon the holiday schedule that has proven appropriate for other commuter transit services serving Sacramento, no service should be provided on the following days:

- New Years Day
- Martin Luther King's Birthday
- President's Day
- Memorial Day
- Independence Day
- Labor Day
- Veterans Day
- Thanksgiving Day
- Day After Thanksgiving
- Christmas Day

Ridership Estimate

Ridership that would be generated by this plan is estimated by considering the total potential ridership (which reflects the quality of service provided at existing peer commuter transit systems serving downtown Sacramento, as well as Butte – Sacramento travel patterns) and applying a series of factors to reflect the quality of service that would be provided under this

alternative compared to that of the peer systems. Details regarding the methodology can be found in Attachment B.

As shown in Table 4, ridership (once full potential is realized) is estimated to total roughly 20,100 one-way trips annually, or 79 passenger-trips per day. Nearly all of the ridership (an estimated 97 percent) is associated with Sacramento-bound passengers. These figures reflect full potential ridership, once the service is well-established. Typically, new transit services do not achieve full ridership until the third year of operation, as it takes several years for potential passengers to become fully aware of the service, and to make changes in their daily habits needed to use transit service. While the proportion of full ridership that would occur in the first few years of service depends on marketing efforts, ridership is typically 60 to 70 percent of ultimate ridership in the first year of service, and 90 percent in the second year. Conservatively assuming 60 percent for the first year, this equates to:

- Year One – 12,060 one-way passenger-trips
- Year Two – 18,090 one-way passenger-trips
- Year Three and Beyond – 20,100 one-way passenger-trips

Fare Revenue

A reasonable fare for the service was determined based upon a review of the fares charged for similar commuter services in the Sacramento region, considering the relative distances. Recommended fares are as follows:

- One-way trip between Butte County and Sacramento \$10
- Monthly pass between Butte County and Sacramento \$300
- One-way trip between Butte County and Marysville \$5
- Monthly pass between Butte County and Marysville \$150
- One-way trip between Sacramento and Marysville \$5

Applying the recommended fares identified above, and conservatively assuming 100 percent monthly pass ridership, the average fare per one-way passenger trip would be \$7.50 for passengers traveling to/from Sacramento, and \$3.75 for passengers traveling to/from Marysville. The resulting estimated annual fare revenue (based on full ridership realization) totals \$149,000 per year, as shown in Table 4.

Operating Costs

Operating costs for the commuter service were based on the following equation, with specific figures provided by the current transit provider:

$$\text{Operating Costs} = \$67.38 \times 3,454 \text{ vehicle service hours} + \\ \$21.00 \times 1,528 \text{ driver deadhead hours}$$

The resulting figure is roughly \$265,000 annually for transit provider costs. Adding in the other operating costs for fuel, BCAG staff time and marketing efforts, the total base operating cost is

estimated to be \$400,000 per year. Subtracting the estimated fare revenue yields an operating subsidy requirement of roughly \$251,000 per year. Note that these figures do not include the cost to lease vehicles, as recommended for the pilot program. An approximate cost to lease the three vehicles is roughly \$250,000 on a yearly basis. As such, with the vehicle lease included, total costs on a yearly basis for the commuter program would equal \$650,000 per year. These figures are estimates based on current conditions, and have the potential to change as the program and agreements are finalized.

Service Plan Performance Analysis

Transit services are typically considered based upon the following performance measures:

- **Passenger-trips per vehicle service-hour** is a key measure of service effectiveness. As indicated, the plan would carry roughly 5.82 passengers per hour. While this is relatively low compared with local urban services, it reflects the long travel times of the individual passengers.
- The **operating subsidy per passenger-trip** measures the cost efficiency of public transit funding. The plan would cost roughly \$12.49 per passenger-trip. Note that this is exclusive of the costs associated with leasing the vehicles.
- The **farebox return ratio** is the ratio of passenger fares (including monthly pass sales revenue) divided by the operating cost. It is the key measure required by the Transportation Development Act. This measure is calculated to be 37 percent for the recommended plan. Note that these figures consider marginal operating costs only, and do not include any allocated fixed costs in the denominator.

RECOMMENDED CAPITAL PLAN

Bus Fleet Expansion

The vehicle requirements for commuter services are very different than the standard vehicles used for local services. As the travel length is significantly longer with commuter routes, providing increased comfort and amenities is key in encouraging people to choose transit over personal vehicles. On commuter buses, or “over-the-road coaches”, these amenities typically include:

- Forward facing seats with higher seat backs and armrests
- Lighting at each seat, controlled by the passenger
- Climate control at each seat
- Wi Fi
- Luggage racks

Depending on the make and model of vehicle purchased, other common amenities include reclining seats, footrests and audio/video components. Front bicycle racks are also beneficial, particularly if storage beneath the seats is not available. (If bicycles are allowed to be placed in

the below-seating storage area, tie-downs should be used to avoid them moving around the storage bin in transit.)

As discussed above, it is recommended that BCAG lease the vehicles through Veolia Transportation (the current operator for B-Line services), a move that would minimize capital investments during the first three “pilot years”. Should the program be successful, BCAG should consider purchasing vehicles for future service operations. BCAG would need to lease/purchase a minimum of 2 vehicles for operations and one additional vehicle for back up, for a total of 3 vehicles. Vehicles would need to be 35-foot to 40-foot buses to accommodate the number of passengers on each route, as well as allowing for additional space. As mentioned previously, the estimated cost to lease the needed vehicles through the current operator is roughly \$250,000 per year.

Park and Ride Facilities

Departures for the Sacramento service would occur prior to the daily start of the current B-Line fixed route system; as a result, using transit to get to the commuter service is not possible and a large majority of riders will arrive at the transit stop by auto.

The plan will utilize the existing lots along the service corridor in Chico (Fir Street lot) and Oroville (lot at 3rd St and Grand Ave). In addition to these facilities, an additional lot should be added in the southern portion of the Chico area, as the Fir Street lot is nearly at capacity with current services and as a location near the departing side of an urban area is typically found to be preferable to park-and-ride commuters (as it can minimize total travel time). While there are a number of commercial centers that potentially could provide this function, a preferred location (and the location assumed for the plan) is at the Lowe’s shopping center at the southwest corner of Notre Dame Blvd and Forest Avenue. Buses would access the parking location by exiting SR 99 at Skyway Rd, making a left onto Notre Dame Blvd and another left into the second access driveway. After traveling through the parking lot, buses would exit at Forest Avenue, turn right onto Notre Dame Blvd, and turn right onto Skyway Rd to access the highway. Potential routing through the parking area is shown in Figure 2. Key advantages of this site include:

- Proximity to SR 99;
- Dedicated “roadway” within the parking lot, which allows the bus to travel freely without interfering with vehicles parking;
- Existing 10 foot sidewalk that allows for a waiting location as well as adequate wheelchair boarding location, in addition to existing lighting; and
- Bus access/travel pattern is visible from parking locations, so passengers can see the vehicle coming in advance from their parked cars.

Figure 2
Lowe's Shopping Center Park and Ride, Chico



As shown in the figure, the bus will stop along the existing sidewalk/curb before exiting out onto Forest Avenue. Due to the double exiting travel lane (one through lane and one dedicated right turn lane) the bus has room to stop along the curb for boarding/alighting without excessively impeding the travel of other drivers trying to exit.

BCAG will need to negotiate an agreement with shopping center land owner to use this portion of the parking lot as a park-and-ride facility. As part of this, a study may need to be conducted that analyzes the existing parking utilization of the lot, particularly in the proposed location.

Signage

The final capital element is the need for new signage at stop locations (park-and-ride locations and downtown Sacramento stops). BCAG will need to coordinate with Sacramento RT to provide B-Line information on the signage in the downtown transit core area, as well as to get general approval to use the proposed stops to ensure coordination with other services. A total of 14 signs is estimated, including those in downtown Sacramento.

Downtown Area Daytime Bus Storage

The service plan results in storage of one bus over the mid-day period in downtown Sacramento. At present, other commuter services have an arrangement with Sacramento RT to store buses beneath the Capital Center Freeway (near P Street and 29th Street). A similar agreement would need to be developed between B-Line and Sacramento RT.

RECOMMENDED INSTITUTIONAL AND MANAGEMENT PLAN

Operate Commuter Bus as Short-Term Pilot Program with Contractor

BCAG should operate the project as a pilot project for the initial three year period to allow for both the BCAG and the public to gauge the effectiveness of the service without fully committing to a long-term project and funding at the start. There are two benefits to initially operating the service in this manner, from the agency's perspective: 1) a large funding commitment is not required up front for capital items, staff, etc., and 2) if the project is not successful or does not meet minimum performance standards, it can just be eliminated and the agency is not left with buses they can no longer use.

The service will be operated through a contractor (as an amendment to the existing service contract), with the service contractor providing the necessary three-bus fleet. If the service proves successful and is approved for long term operation, the agency should include the service into a single service contract and/or obtain vehicles. Costs for the contracted service, as proposed by the existing service provider, have been discussed in previous sections.

Marketing for Commuter Services

The new service will need to be marketed to a wide audience, so as to maximize ridership and farebox revenue potential. Recommended outlets include:

- Local media – newspapers, radio and television ads
- Social media – relevant Facebook and Twitter accounts, email lists, etc.
- Public agency websites – BCAG, Butte County and local City government websites
- Private agencies and businesses, including the Chamber of Commerce
- Local colleges – CSU Chico and Butte College
- Sacramento employers – Caltrans, State government offices
- Transportation Management Associations (TMAs) – Yuba/Sutter TMA, Sacramento TMA

A simple but effective marketing strategy would be signage or flyers distributed at existing park-and-ride lots. Greater detailed discussion regarding each of these sources can be found in Attachment B (*Technical Memorandum 2*).

Coordination of Services with Yuba/Sutter Transit

The recommended service plan includes a stop in Marysville, which will require coordination with Yuba / Sutter Transit to ensure both services work in concert with one another. Discussions between agencies should include agreements for use of bus stops, mutual assist (such as if vehicles break down in route and maintenance is required), maintenance emergencies and other similar scenarios.

Coordinate and Communicate with Sacramento RT

BCAG/B-Line must also coordinate with Sacramento RT, as the service would be entering their jurisdiction and using their system's stops. Coordination with Sacramento RT includes developing agreements that allow B-Line to operate services in the downtown area (similar agreements are in place with Yuba / Sutter Transit and El Dorado Transit), as well as an agreement for use of stops and coordination with the other services in the area, and optimally for mid-day storage.

Develop and Implement Performance Monitoring and Goals

As with any new service, it is important to have performance goals and measures in place so that the service can effectively be evaluated. The following goals, performance measures, and standards are designed to reflect the adopted policy statements of the region. Goals establish general direction for policies and operation and are value-driven providing long-range perspective. Standards are quantifiable observable measures that reflect achievement of the goals. The performance measures provide the mechanism for judging whether or not the standards have been met.

Three major goals are identified: a service efficiency goal (reflecting efficient use of financial resources), a service effectiveness goal (reflecting effectiveness in serving passengers), and a service quality goal. These measures can be used to determine whether the service is meeting minimum goals, something that is particularly important in the case of operating a pilot program.

Standards are provided as appropriate, based upon observed performance of similar commuter services in California.

Service Efficiency Goal

To maximize the level of services that can be provided within the financial resources associated with the provision of transit services. The standards should not be strictly applied to new routes for the first two years of service, so long as 60 percent of standard is achieved after one full year of service and a favorable trend is maintained.)

Farebox Recovery Ratio Standard – The ratio of farebox income to operating costs should meet or exceed 30 percent.

Subsidy Standard – The public operation/administrative subsidy per passenger-trip for service should not exceed \$15, and should be adjusted annually to account for inflation.

Service Effectiveness Goal

To maximize the ridership potential of B-Line's potential commuter service. (The standards should not be strictly applied to new routes for the first two years of service so long as 60 percent of standard is achieved after one year and a favorable trend is maintained.)

Service Effectiveness Standard – Serve a minimum of 5 passenger-trips per vehicle service hour.

Service Quality Goal

To provide safe, reliable, and convenient transit services.

Service Availability Standard – Provide transit service to employment centers that can support commuter service consistent with the service efficiency and effectiveness goals.

On-Time Performance Standard – 90 percent of all trips should be operated "on-time," defined as not departing early, and no more than 5 minutes late.

Missed Trips Standard – The proportion of runs not operated or more than 15 minutes late should be no more than 1 percent.

THREE-YEAR COMMUTER SERVICE PLAN SUMMARY

Table 5 presents the operating characteristics for the commuter service plan for the three-year pilot program period. As shown in the table, the total costs are roughly \$1.97 million, while a total of \$1.6 million in operated subsidy is required for the three years. On a year by year basis, costs decrease as revenues increase (mainly from full realization of ridership and the associated farebox) and initial expenses for capital and marketing items decrease. Assumptions for this plan are as follows:

- Transit provider costs are based upon revenue hours operated plus the cost for driver deadhead, and will increase each year with inflation. In total, transit provider costs for operating the service are estimated to total \$819,090 over the three-year period.
- Fuel costs are estimated to total \$270,000 over the plan period, or \$90,000 per year.
- Marketing costs will total \$55,000 for the plan period. The first year reflects a higher figure for typical start-up costs and more aggressive campaigning, while subsequent years are assumed to only require ongoing maintenance costs, such as printing and fees for advertising.
- Monitoring of the program and contract, as well as Caltrans reporting for the grant funding, will require BCAG staff time. This is assumed to roughly \$20,000 per year, for a total of \$60,000.
- The plan assumes that vehicles will be leased through the current service provider, at the estimated cost of \$250,000 for the appropriate vehicles. In total, this equates to \$750,000 for the entire plan period.
- New bus stop signage is a first-year only expense, estimated at roughly \$3,500 for the new 14 signs.
- A financial agreement will need to be made between the landowner and BCAG for use of an existing parking lot in Chico for the new park-and-ride location. The plan has estimated a cost of \$5,000, totaling \$15,000 over the three-year program period. Not that this is just an estimate, and could likely change.
- Ridership reflects a gradual full-realization over the program period, with 100 percent ridership occurring in year three. As such, farebox revenues increase each year, and will total \$372,000 over the three-year period.

Funding beyond what is shown for farebox revenue has not been included for the purposes of this plan. Potential funding for operating could be obtained from the Transit and Intercity Rail Capital Program grant through Caltrans, which is geared towards projects/services that reduce greenhouse gas emissions. This funding source could be used for both operating and capital, and requires a minimum allocation request of \$500,000 per year (or \$1.5 million over the three-year period). Should this grant program be awarded to BCAG, the local subsidy required per

year would range from \$69,500 in Year 1 to \$12,140 in Year 3; overall, the total amount of subsidy required to cover the three-year plan is roughly \$100,590.

TABLE 5: Financial Plan for 3-Year Pilot Program

Chico to Sacramento Commuter Bus Service

	Year 1	Year 2	Year 3	Total 3-Year Plan Period
Operating Cost	\$400,000	\$397,950	\$406,140	\$1,204,090
<i>Transit Provider Costs</i>	<i>\$265,000</i>	<i>\$272,950</i>	<i>\$281,140</i>	<i>\$819,090</i>
<i>Estimated Fuel Costs</i>	<i>\$90,000</i>	<i>\$90,000</i>	<i>\$90,000</i>	<i>\$270,000</i>
<i>Marketing Costs</i>	<i>\$25,000</i>	<i>\$15,000</i>	<i>\$15,000</i>	<i>\$55,000</i>
<i>BCAG Staff Time</i>	<i>\$20,000</i>	<i>\$20,000</i>	<i>\$20,000</i>	<i>\$60,000</i>
Vehicle Lease Cost	\$250,000	\$250,000	\$250,000	\$750,000
Other Capital Costs	\$8,500	\$5,000	\$5,000	\$18,500
<i>Bus Stop Signage</i>	<i>\$3,500</i>	<i>--</i>	<i>--</i>	<i>\$3,500</i>
<i>New Park-and-Ride Lease</i>	<i>\$5,000</i>	<i>\$5,000</i>	<i>\$5,000</i>	<i>\$15,000</i>
Total Cost	\$658,500	\$652,950	\$661,140	\$1,972,590
Ridership	12,060	18,090	20,100	50,250
Farebox Revenue	\$89,000	\$134,000	\$149,000	\$372,000
Total Local Subsidy Required	\$569,500	\$518,950	\$512,140	\$1,600,590

Source: LSC Transportation Consultants Inc., 2014

ATTACHMENT A

Technical Memorandum 1: Existing Study Area Characteristics, Transit Services, and Commuter Transit Demand

Butte County Inter-City Commuter Bus Feasibility Study

*Technical Memorandum One:
Existing Study Area Characteristics, Transit Services,
and Commuter Transit Demand*



Prepared for the
Butte County Association of Governments

Prepared by



LSC Transportation Consultants, Inc.

Butte County Inter-City Commuter Bus Feasibility Study

*Technical Memorandum 1:
Existing Study Area Characteristics,
Transit Services, and Commuter Transit Demand*

Prepared for the:

Butte County Association of Governments
2580 Sierra Sunrise Terrace, Suite 100
Chico, California 95928

Prepared by:

LSC Transportation Consultants, Inc.
2690 Lake Forest Road, Suite C
P.O. Box 5875
Tahoe City, California
530 ♦ 583-4053

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Transportation considerations play a key role in the quality of life provided by any community. Recent economic changes have led to more people living farther away from their place of work in an effort to seek more affordable housing options, and to working shifting jobs to more distant locations. As such, with few regional commute options, people are relying more on their private automobile for their commutes, in turn impacting traffic patterns on major roadways and incurring significant costs.

The Butte County Association of Governments, in response to long-standing interest in the potential for commuter service to the Sacramento region, has retained LSC Transportation Consultants, Inc., to prepare a feasibility study for inter-city commuter bus service between the County and Sacramento. As the state capital with a dense concentration of workers with consistent work hours, Sacramento is a relatively strong “market” for commuter transit services from many other portions of central California, including Yuba City/Marysville, Placer County, El Dorado County, Stockton, Vacaville and Woodland. This study provides an opportunity to explore the potential for a regional transit service that would not only provide an alternative commute mode for residents of Butte County, but also service for other regional transit needs that are identified.

This *Technical Memorandum* presents and reviews the setting for transportation, including demographic factors, current transportation services and infrastructure, and estimated transit demand for commute service. The document also contains the results of a community survey conducted online. The findings of this document will be used to guide the next steps in the development of the feasibility study, which will identify service alternatives, required capital needs and funding options.

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STUDY AREA

Butte County is located roughly 150 miles north of Sacramento, in the northern Central Valley. The area lies along the Feather River and Sacramento River, stretching from the agricultural areas of the Sacramento Valley eastward to the peaks of the Northern Sierra and Southern Cascades. Figure 1 shows the location of Butte County in a regional context. It is home to several colleges and universities. Further, many natural resources are located in the area, including portions of the Lassen and Plumas National Forests and the Sacramento River and Butte Sink National Wildlife Refuges. Butte County is also home to three Native American Indian Tribes – The Berry Creek Rancheria of Tyme Maidu Indians of California (Oroville), the Mooretown Rancheria of Maidu Indians of California (Oroville), and the Mechoopda Indian Tribe of Chico Rancheria (Chico).

This chapter presents background information key to formulating the feasibility study. Included in the discussion are key demographic components, including population characteristics, regional and local economy / employment data and regional commute data.

POPULATION CHARACTERISTICS

Between the last two U.S. Census surveys, the Butte County population has grown 7.6 percent, from 203,171 persons in 2000 to 218,635 persons in 2010. Looking more closely at the incorporated towns in the County, Chico has grown significantly, up 42 percent from 2000, as show in Table 1. Gridley, Oroville and Biggs have also seen increases, at roughly 19.8 percent, 18.2 percent and 15.8 percent, respectively. The City of Paradise experienced relatively little growth, with the population increase only 0.1 percent over the 10 year period. In the remaining areas of the County, population actually shrunk by roughly 13.9 percent.

Population – Age

Table 2 presents information for Butte County's population by age group. As shown, population is distributed relatively evenly throughout the Census' designated categories. However, for a commute-related study, it is important to observe the age groups that are generally within the labor force, which is shown in the lower portion of the table.

The Census Bureau considers persons over the age of 16 years to be eligible for the work force, which accounts for 81.5 percent of Butte County's population. However, assuming an average retirement age of 65 years, approximately 66.4 percent (145,174 persons) of the population is between 16 years and 64 years of age. The California Department of defines the "Working Age" as 25 years to 64 years. As shown in the table, approximately 48.3 percent of the County population falls within this category, with 105,601 persons.

**FIGURE 1:
Butte County Site and Location Map**



TABLE 1: Butte County Population Trends

	2000	2010	Change 2000 - 2010	% Change 2000 - 2010	Avg Annual % Change
Butte County	203,171	218,635	15,464	7.6%	0.74%
Chico	59,954	85,130	25,176	42.0%	3.57%
Gridley	5,382	6,449	1,067	19.8%	1.83%
Paradise	26,408	26,425	17	0.1%	0.01%
Oroville	13,004	15,369	2,365	18.2%	1.68%
Biggs	1,793	2,077	284	15.8%	1.48%
Remainder of County	96,630	83,185	-13,445	-13.9%	-1.49%

Source: 2000 US Census; US Census American Community Survey 2006 - 2010, 5 yr Estimates

TABLE 2: Butte County Population by Age

Age	# of Persons	% of Total Population
Under 5 years	12,244	5.6%
5 to 9 years	12,244	5.6%
10 to 14 years	13,337	6.1%
15 to 19 years	18,147	8.3%
20 to 24 years	24,050	11.0%
25 to 29 years	13,337	6.1%
30 to 34 years	11,588	5.3%
35 to 39 years	11,588	5.3%
40 to 44 years	12,462	5.7%
45 to 49 years	14,211	6.5%
50 to 54 years	15,304	7.0%
55 to 59 years	14,430	6.6%
60 to 64 years	12,681	5.8%
65 to 69 years	8,964	4.1%
70 to 74 years	7,434	3.4%
75 to 79 years	6,340	2.9%
80 to 84 years	4,810	2.2%
85 years and over	5,466	2.5%
Total	218,635	100.0%
<i>Selected Age Categories</i>		
16 Years and Older	178,188	81.5%
16 to 64 Years	145,174	66.4%
25 to 64 Years	105,601	48.3%
65 Years and Older	33,014	15.1%

Source: US Census American Community Survey 2006 - 2010 5 yr Estimates, 2013

Population – Income

As this study is considering a commuter transit service, poverty status for Butte County residents by employment status is also reviewed, and is shown in Table 3. Persons that are fall into the low income category utilize public transit more than non-low income persons to complete their trips. This data looks at the population that is over the age of 16 years within the County that is considered to be below the poverty level. Approximately 13.7 percent, or 14,046 persons, of the Butte County labor force are considered to be low income. Of these, 10,312 are employed (10.1 percent of the County labor force) and 3,734 persons are unemployed (3.6 percent of County labor force). An additional 16,542 persons over the age of 16 years were not in the labor force but were below the poverty level. A total of 39,290 persons, taking into account all ages, within the County are considered to be low income.

	# of Persons	% of Total County Labor Force
<i>Persons In Labor Force</i>	14,046	13.7%
Employed	10,312	10.1%
Unemployed	3,734	3.6%
<i>Not in Labor Force</i>	16,542	
<i>Total # Persons Below Poverty Level 16 Years and Older</i>	30,588	
<i>Total Butte County Labor Force</i>	102,520	
<i>Total # Persons in Butte County Below Poverty Level</i>	39,290	
<i>Source: US Census American Community Survey 2006 - 2010 5 yr Estimates, 2013</i>		

Vehicle Availability

Another important factor to consider in any transit study is the number of vehicles available for Butte County households. Persons with no access to vehicles generally are more inclined to rely on public transit for their trip, including commutes. Table 4 presents the vehicles available for Butte County households for workers age 16 years and older. Of the working persons in Butte County, only 2.9 percent do not have a vehicle available. However, given this circumstance, these residents probably have a low likelihood to be commuting to Sacramento for work. Another 18.1 percent of households only have one vehicle available, 41.5 percent have two vehicles available, and 37.5 percent have three or more vehicles.

TABLE 4: Vehicles Available in Butte County Households

For Workers 16 Years and Over in Households

	# of Persons	% of Total
No Vehicle Available	2,508	2.9%
One Vehicle Available	15,652	18.1%
Two Vehicles Available	35,888	41.5%
Three or More Vehicles Available	32,429	37.5%
<i>Total</i>	<i>86,477</i>	<i>100.0%</i>

Source: US Census American Community Survey 2006 - 2010 5 yr Estimates, 2013

Population Projections

The California Department of Finance has projected the population for Butte County over the next thirty years, as represented in Table 5. Understanding the general growth trends of the population will help to define the needs of working age persons in the County. The table highlights the “working age” group, which is comprised by persons between the ages of 25 years and 64 years. Note that due to differing data collection techniques, the 2010 population differs slightly from what has been presented in other tables. The Butte County population is expected to increase by 9.8 percent overall by 2020, by 29.1 percent in 2030 and by 44.4 percent in 2040. The overall trend over the next thirty years shows that the early retirees (age 65 to 74 percent) and older retirees (75 years and older) will have the greatest increases in population. Most notably, the population of persons age 65 to 74 years will jump dramatically by 2020 (by 61.4 percent), and will taper off through 2040. The working age group has a more consistent upswing, with the total population in 2040 between age 25 and 64 years increasing by nearly 45 percent over 2010 levels. All other factors being equal, this indicates a growing potential for commuting.

TABLE 5: Population Projections by Age Group

	2010 ¹	2020	% Change 2010 - 2020	2030	% Change 2010 - 2030	2040	% Change 2010 - 2040
0 to 17 Years	46,333	47,248	2.0%	51,119	10.3%	54,950	18.6%
18 to 24 Years	31,966	31,520	-1.4%	34,532	8.0%	34,792	8.8%
25 to 64 Years	107,871	116,315	7.8%	136,266	26.3%	156,310	44.9%
65 to 74 Years	17,272	27,879	61.4%	31,938	84.9%	32,035	85.5%
75 Years and Older	16,549	18,559	12.1%	30,226	82.7%	39,631	139.5%
Total Butte County	219,990	241,521	9.8%	284,082	29.1%	317,718	44.4%

Note 1: 2010 population differs from 2010 Census data in other tables due to different data collection techniques

Source: California Department of Finance Demographic Research Unit, 2013

BCAG also conducts a regional growth forecast study, with the most recent completed for the period between 2010 and 2035. Their study suggests that growth in the southern portion of the County will see most of the growth, with Biggs, Gridley and Oroville doubling in population by 2035. The City of Chico, however, will still see the largest overall growth, with roughly 16,339 to 22,096 new housing units forecast to be constructed by 2035.

ECONOMY AND EMPLOYMENT

Labor Force and Unemployment

Approximately 57.5 percent of the population age 16 years and over is in the labor force, with a total of 102,520 persons. Table 6 presents employment status for Butte County residents by age group. As shown, the countywide unemployment rate in 2010 was 11.4 percent. The greatest unemployment rate was found within the age group between 16 and 19 years. The table shows that as age increases, unemployment rates decrease, with persons 75 years and older having the lowest rate. Persons within the working age group (age 25 to 64 years of age) had rates lower than the County average – persons 25 to 44 years of age had a 10.1 percent unemployment rate, while persons 45 to 54 years had an 8.3 percent rate and persons 55 to 64 percent had a 7.3 percent unemployment rate. Forecasts for future employment in Butte County from BCAG show that employment is expected to grow through 2035, ranging from a 49 percent to 65 percent growth.

TABLE 6: Employment Status for Butte County Residents

For Population 16 Years and Over

	Persons In Labor Force	Persons Employed	Persons Unemployed	Unemployment Rate	Persons Not In Labor Force
16 to 19 Years	6,138	4,244	1,894	30.9%	9,514
20 to 24 Years	16,931	14,146	2,730	16.1%	6,937
25 to 44 Years	38,161	34,156	3,842	10.1%	10,737
45 to 54 Years	21,954	20,122	1,822	8.3%	7,604
55 to 64 Years	15,260	14,148	1,112	7.3%	11,942
65 to 74 Years	3,454	3,161	293	8.5%	12,922
75 Years and Over	622	583	39	6.3%	16,077
<i>Total Butte County</i>	<i>102,520</i>	<i>90,560</i>	<i>11,732</i>	<i>11.4%</i>	<i>75,733</i>

Source: US Census American Community Survey 2006 - 2010 5 yr Estimates, 2013

Major Employers

Not surprisingly, the State of California is the largest employer in the City of Sacramento, according to the 2012 *Comprehensive Annual Financial Report*, with 69,763 employees. This is inclusive of all agencies, such as Caltrans, the EPA, Employment Development Department, and other agencies within the state. The majority of these agencies are located in downtown

Sacramento. Sacramento County ranks second, with 11,450 employees, followed by the UC Davis Health System (7,725 employees), Dignity Health (7,069 employees), and the Intel Corporation (6,630 employees). Other larger employers in the City include the various school districts, Kaiser Permanente, Sutter Health and the City of Sacramento.

COMMUTER DATA

Commute Travel Patterns

The US Census maintains the “Longitudinal Employer Household Dataset” which provides detailed data on the location of employment for various areas of residence as well as data on the location of residences of a specific area’s workers. Table 7 presents commute pattern data for 2011 at the county and city/town level. The top portion of the table presents information about where residents of Butte County work, while the lower portion shows where people live that commute into Butte County.

TABLE 7: Butte County Local and Regional Commute Patterns, 2011					
Where Butte County Residents Work					
<u>Job Counts in Counties</u>	<u># Persons</u>	<u>% of Total</u>	<u>Job Counts in Cities/Towns</u>	<u># Persons</u>	<u>% of Total</u>
Butte County, CA	44,363	67.7%	Chico city, CA	23,246	35.5%
Sacramento County, CA	3,086	4.7%	Oroville city, CA	7,558	11.5%
Sutter County, CA	1,698	2.6%	Paradise town, CA	4,779	7.3%
Glenn County, CA	1,221	1.9%	Sacramento city, CA	1,570	2.4%
Shasta County, CA	1,181	1.8%	Yuba City city, CA	1,289	2.0%
Yuba County, CA	1,047	1.6%	Oroville East CDP, CA	1,162	1.8%
Alameda County, CA	978	1.5%	Durham CDP, CA	1,079	1.6%
Tehama County, CA	958	1.5%	Gridley city, CA	1,007	1.5%
Placer County, CA	951	1.5%	Butte Valley CDP, CA	943	1.4%
Contra Costa County, CA	768	1.2%	Redding, CA	939	1.4%
Santa Clara County, CA	706	1.1%	Marysville city, CA	617	0.9%
Remainder of Counties	8,580	13.1%	Remainder of Cities	21,348	32.6%
<i>Total Number of Jobs</i>	<i>65,537</i>	<i>100.0%</i>	<i>Total Number of Jobs</i>	<i>65,537</i>	<i>100.0%</i>
Where Persons Employed in Butte County Live					
<u>County of Residence for Workers</u>	<u># Workers</u>	<u>% of Total</u>	<u>City/Town of Residence for Workers</u>	<u># Workers</u>	<u>% of Total</u>
Butte County, CA	44,363	69.6%	Chico city, CA	19,700	30.9%
Glenn County, CA	1,915	3.0%	Paradise town, CA	5,530	8.7%
Sutter County, CA	1,713	2.7%	Oroville city, CA	2,635	4.1%
Tehama County, CA	1,637	2.6%	Magalia CDP, CA	2,014	3.2%
Sacramento County, CA	1,559	2.4%	Oroville East CDP, CA	1,537	2.4%
Shasta County, CA	1,420	2.2%	Durham CDP, CA	1,345	2.1%
Yuba County, CA	1,212	1.9%	Thermalito CDP, CA	1,242	1.9%
Placer County, CA	707	1.1%	Yuba City city, CA	976	1.5%
Colusa County, CA	651	1.0%	South Oroville CDP, CA	968	1.5%
Nevada County, CA	646	1.0%	Gridley city, CA	915	1.4%
Contra Costa County, CA	559	0.9%	Redding city, CA	767	1.2%
Remainder of Counties	7,401	11.6%	Remainder of Cities	26,154	41.0%
<i>Total Number of Workers</i>	<i>63,783</i>	<i>100.0%</i>	<i>Total Number of Workers</i>	<i>63,783</i>	<i>100.0%</i>
<i>Source: US Census Bureau LEHD Database, 2013</i>					

A substantial majority of Butte County residents, roughly 67.7 percent, work within the county. Approximately 35.5 percent of residents work in Chico, which is the major employment center for Butte County. Another 11.5 percent work in Oroville, where many of the County department and agency offices are located.

Approximately 4.7 percent of the study area residents commute to Sacramento County, or a total of 3,086 persons. Of these commuters to Sacramento County, 50.8 percent are traveling to the City of Sacramento (1,570 persons). Another 1,698 persons (2.6 percent) commute from Butte County to Sutter County, of which 75.9 percent (or 1,289 persons) are traveling to Yuba City. A total of 1,047 (1.6 percent) work in Yuba County. It is worth noting that, though Sacramento County is substantially further from Butte County than Yuba or Sutter Counties, there are still a greater number of Butte County residents making the longer commute.

Of the workers employed in Butte County, 69.6 percent are residents of the County, as shown in the lower half of Table 7. Another 3 percent commute from Glenn County, 2.7 percent from Sutter County and 2.6 percent from Tehama County. Only 2.4 percent commute from Sacramento County. Looking at more detail, approximately 30.9 percent of workers in the County live in Chico, followed by 8.7 percent in Paradise and 4.1 percent in Oroville. Roughly 1.5 percent of employed persons in Butte County are commuting from Yuba City, or 976 persons.

Detailed Commute Analysis to Downtown Sacramento

A more detailed look at commuter data from the LEHD database shows that approximately 689 Butte County residents travel to downtown Sacramento for work (Table 8). Downtown Sacramento is defined as south of the American River, east of the Sacramento River, north of Broadway and west of 16th Street, as shown in Figure 2. Also shown is the Central Business District, which is bound by R Street to the south, H Street to the north, the Sacramento River to the east and 16th Street to the west.

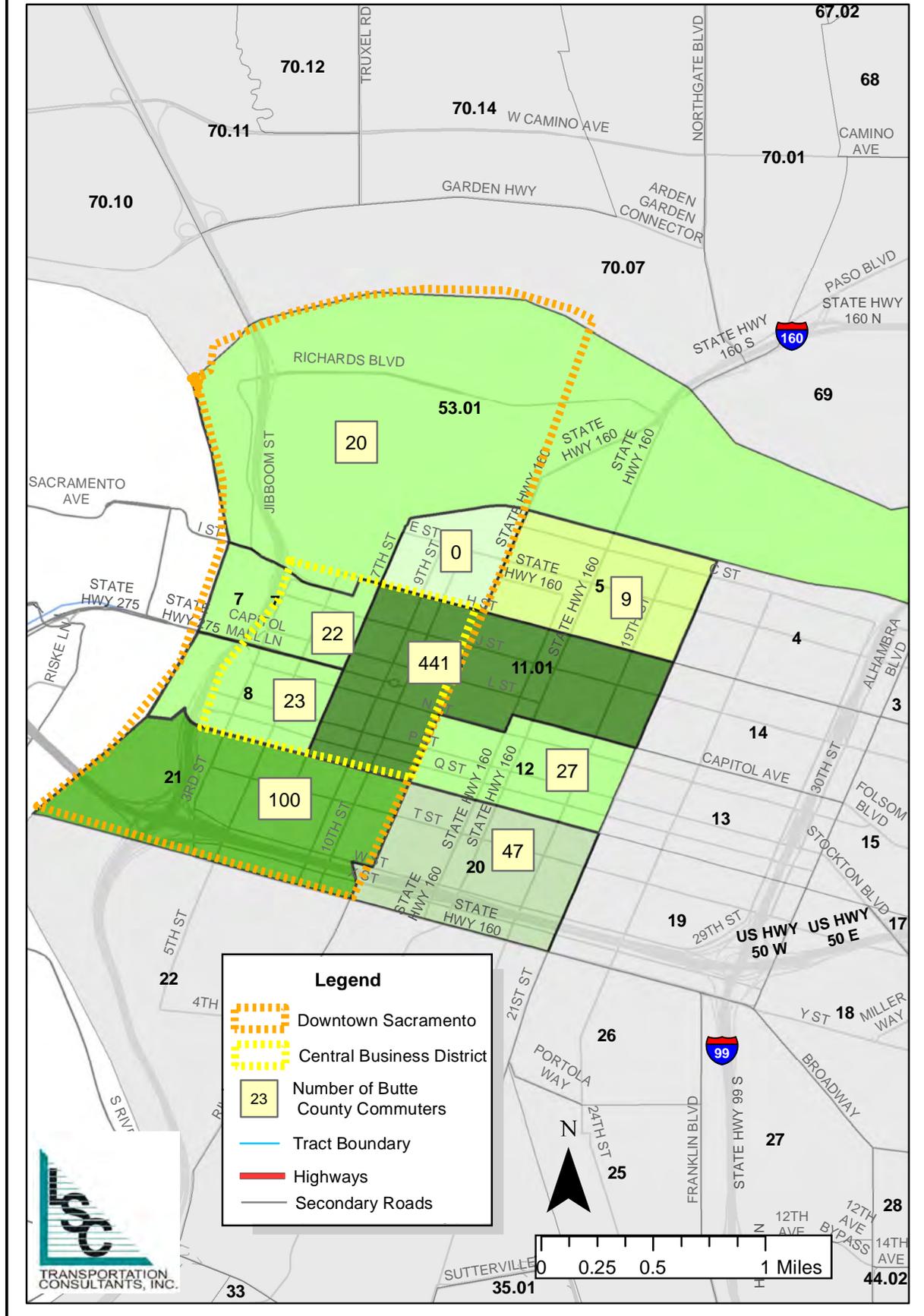
TABLE 8: Work Location of Butte County Residents in Downtown Sacramento

Data for 2011

	Downtown Sacramento Work Location (Census Tract)									Total Commuters	% Total Commuters
	53.01	5	6	7	8	11.01	12	20	21		
Chico	7	5	0	7	11	190	8	20	44	292	42.4%
Biggs	0	0	0	1	1	8	0	1	1	12	1.7%
Gridey	0	1	0	1	1	25	0	2	4	34	4.9%
Paradise	3	0	0	5	4	51	6	12	16	97	14.1%
Oroville	4	2	0	2	2	53	8	2	7	80	11.6%
Remainder of County	6	1	0	6	4	114	5	10	28	174	25.3%
Total County	20	9	0	22	23	441	27	47	100	689	100.0%
% of Downtown Sacramento Commuters	2.9%	1.3%	0.0%	3.2%	3.3%	64.0%	3.9%	6.8%	14.5%		

Source: US Census LEHD Database, 2013

**FIGURE 2:
Work Location of Butte County Residents in Downtown Sacramento by Census Tract**



The majority of the commuters originate in Chico (42.4 percent of the total commuters to downtown Sacramento). Outlying areas of the incorporated cities comprise 25.3 percent of the total commuters to downtown, followed by Paradise (14.1 percent), Oroville (11.6 percent), Gridley (4.9 percent) and Biggs (1.7 percent).

Figure 2 presents the concentration of Butte County commuters in downtown Sacramento. As shown, 64 percent of all commuters work within Census Tract 11.01. This tract contains the majority of the State of California government buildings, including the Capitol. Roughly 14.5 percent work in Census Tract 21, which also houses many government offices. The remaining commuters are located in other areas of the downtown, with a fairly even distribution. Given this data, it is likely that many of the commuters are employees of the State of California, based on the location of their work.

Distance and Travel Time to Work

Another measure to help indicate the location of resident's place of work is to look at the distance driven to work. Table 9 presents the distance driven for commuting purposes. As shown, just under half of workers commute less than 10 miles. However, a substantial portion (23.5 percent) commute more than 50 miles one-way.

Direction / Distance	Number of Residents	% of Total
Less than 10 miles	32,892	49.3%
10 to 24 miles	13,446	20.2%
25 to 50 miles	4,676	7.0%
Greater than 50 miles	15,700	23.5%
Total	66,714	100.0%

Source: US Census LEHD Database, 2013

Table 10 presents the travel time to work data for Butte County residents, which can further define commute patterns. As shown, 48.6 percent of residents travel 14 minutes or less to work, and another 14.5 percent travel 15 to 19 minutes. This data is consistent with the distance to work and LEHD commute information, reinforcing that the majority of residents also work within Butte County. The lower portion of the table shows selected trip pattern travel times in the southbound direction. As shown, the travel time to Yuba City from Butte County is between 25 and 60 minutes, while the travel time to Sacramento is between 1 hour 10 minutes and 1 hour 45 minutes. According to the data presented in the table, approximately 5.5 percent of workers drive more than 60 minutes to work, 3.5 percent drive between 45 and 59 minutes, and 4.5 percent drive 35 to 44 minutes.

TABLE 10: Travel Time to Work for Butte County Residents

For Workers 16 Years and Over Who Did Not Work at Home

	# of Persons	% of Total
Less than 10 minutes	20,860	25.3%
10 to 14 minutes	19,211	23.3%
15 to 19 minutes	11,955	14.5%
20 to 24 minutes	8,080	9.8%
25 to 29 minutes	3,545	4.3%
30 to 34 minutes	7,668	9.3%
35 to 44 minutes	3,710	4.5%
45 to 59 minutes	2,886	3.5%
60 or more minutes	4,535	5.5%
<i>Total</i>	<i>82,450</i>	<i>100%</i>
<hr/>		
Mean Travel Time (minutes)	20.8	
<hr/>		
<i>Selected Trip Pattern Travel Times - Southbound (Assuming No Traffic Congestion)</i>		
Oroville to Chico	29 minutes	
Gridley to Chico	36 minutes	
Chico to Yuba City	57 minutes	
Oroville to Yuba City	37 minutes	
Gridley to Yuba City	24 minutes	
Chico to Sacramento	1 hour 42 minutes	
Oroville to Sacramento	1 hour 19 minutes	
Gridley to Sacramento	1 hour 10 minutes	
<hr/>		
<i>Source: US Census American Community Survey 2006 - 2010 5 yr Estimates, 2013</i>		

Journey to Work

Journey to work, or means of transportation to work, provides information regarding how people are commuting. Persons who carpool tend to have longer trip distances; sharing the responsibility and costs makes farther trips more palatable to many commuters. Due to the longer distances and costs associated, this group contains users that are more likely to use commuter transit services. Information gleaned from journey to work data can help identify the number of potential transit users, such as those that currently participate in carpools. While the data is not location specific, Table 11 shows that 10.8 percent of workers in Butte County carpool to work. Over three-quarters of employed residents drive alone.

TABLE 11: Means of Transportation to Work*For Workers 16 Years and Over*

	# of Persons	% of Total
Drove Alone	65,624	75.4%
Carpooled	9,400	10.8%
Public Transportation	1,044	1.2%
Walked	3,220	3.7%
Bicycle	2,263	2.6%
Taxicab, Motorcycle or Other	870	1.0%
Worked at Home	4,613	5.3%
<i>Total</i>	87,034	100.0%

Source: US Census American Community Survey 2006 - 2010 5 yr Estimates, 2013

BACKGROUND**PUBLIC TRANSIT SERVICES – BUTTE COUNTY**

Public transit in the Butte County region is provided through the B-Line fixed route service and paratransit programs. The fixed route program includes 21 routes, providing service to Chico, Oroville, Biggs, Paradise, Gridley and adjacent rural areas. Bus service is offered seven days per week (depending on the route), with operating times varying by route (as discussed below). Paratransit is provided to seniors 65 years or older and to persons with disabilities, and is generally provided within $\frac{3}{4}$ -mile of the fixed route services in Chico, Paradise, Oroville, Biggs and Gridley. Figure 3 presents the B-Line, as well as Yuba Sutter Transit, regional routes graphically.

Routes

As mentioned, B-Line operates 21 fixed routes throughout the County. A summary of the routes are shown in Table 12. The following discussion provides information for each of the routes operating in Butte County.

Chico Routes

There are 10 routes that operate wholly within the Chico city limits, nine of which originate / end at the Chico Transit Center in downtown. Routes generally operate Monday through Saturday, with the exception of Routes 7 and 8. Transfers are made at the Transit Center, as well as at the transfer points located at Pillsbury Road, Lassen and Ceres, and Forest Avenue. Route 5 serves the Park and Ride lot located at Fir Street and SR 32, near Highway 99. Routes operating within Chico include:

- Route 2: Mangrove
- Route 3: Nord / East
- Route 4: First / East
- Route 5: E. 8th Street
- Route 7: Bruce / Manzanita
- Route 8: Nord
- Route 9: Warner / Oak
- Route 15N: Esplanade / Park / MLK
- Route 15S: Esplanade / Park / MLK
- Route 16: Esplanade / SR 99

In addition, B-Line also operates the following routes that connect Chico with other areas of Butte County:

- Route 20: Chico – Oroville
- Route 32: Gridley – Chico
- Route 40: Paradise – Chico
- Route 41: Paradise Pines - Chico

Route 20 operates seven days per week, the only one that does so within the B-Line system. Designed to accommodate commuters, this route serves both the Oroville and Chico Transit Centers, as well as the park and ride lots in Chico (Fir St / SR 32) and Oroville (3rd St / Grand

**FIGURE 3:
Butte County Regional Transit Routes**

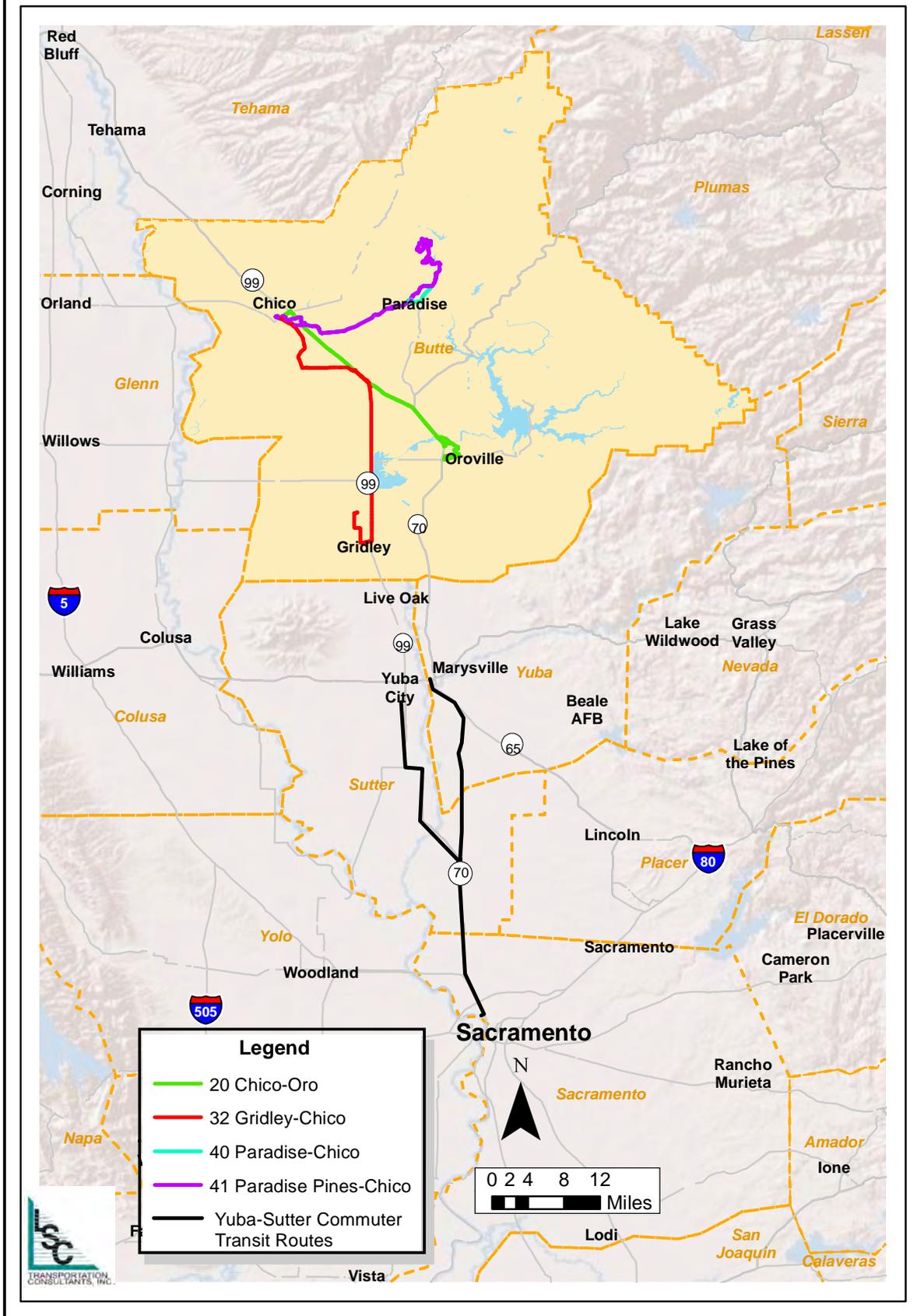


TABLE 12: B-Line Fixed Routes

Route	Service Between.....	Operating Hours		Transit Centers Served	Serves Park and Ride Location?
		Weekdays	Weekends		
Route 2 Mangrove	Downtown Chico	6:15 AM - 8:34 PM	8:15 AM - 6:56 PM	Chico Transit Center	--
Route 3 Nord / East	Downtown Chico	6:18 AM - 9:00 PM	8:50 AM - 7:00 PM	Chico Transit Center	--
Route 4 First / East	Downtown Chico	6:15 AM - 8:59 PM	8:50 AM - 6:59 PM	Chico Transit Center	--
Route 5 E. 8th Street	Downtown Chico	6:15 AM - 8:34 AM	8:15 AM - 6:59 PM	Chico Transit Center	Chico Park and Ride
Route 7 Bruce / Manzanita	Forest Transfer Point	6:45 AM - 5:26 PM	--	--	--
Route 8 Nord	Downtown Chico	7:34 AM - 9:34 PM (M-Th); 7:34 AM - 4:04 PM (Fri)	--	Chico Transit Center	--
Route 9 Warner / Oak	Downtown Chico	7:33 AM - 10:01 PM	8:30 AM - 6:24 PM	Chico Transit Center	--
Route 15N Esplanade / Park / MLK	Downtown Chico	6:15 AM - 9:34 PM	7:50 AM - 6:34 PM	Chico Transit Center	--
Route 15S Esplanade / Park / MLK	Downtown Chico	6:18 AM - 9:38 PM	7:50 AM - 6:57 PM	Chico Transit Center	--
Route 16 Esplanade / SR 99	Downtown Chico	6:55 AM - 6:55 PM	7:55 AM - 5:55 PM	Chico Transit Center	--
Route 20 Chico - Oroville	Downtown Chico	5:50 AM - 7:59 PM	7:50 AM - 6:00 PM	Chico Transit Center Oroville Transit Center	Chico Park and Ride Oroville Park and Ride
Route 24 Thermalito	Downtown Oroville	6:34 AM - 7:30 PM	--	Oroville Transit Center	--
Route 25 Oro Dam	Downtown Oroville	6:12 AM - 6:50 PM	--	Oroville Transit Center	--
Route 26 Olive Highway	Downtown Oroville	6:33 AM - 6:21 PM	--	Oroville Transit Center	--
Route 27 South Oroville	Downtown Oroville	7:10 AM - 6:50 PM	--	Oroville Transit Center	--
Route 30 Oroville - Biggs	Downtown Oroville	7:45 AM - 5:02 PM	8:47 AM - 4:53 PM	Oroville Transit Center	--
Route 31 Paradise - Oroville	Downtown Paradise	6:45 AM - 7:33 AM; 5:05 PM - 5:56 PM	--	Chico Transit Center Paradise Transit Center	--
Route 32 Gridley - Chico	Biggs / Gridley	5:20 PM - 6:30 PM	--	Chico Transit Center	--
Route 40 Paradise - Chico	Paradise	6:00 AM - 7:26 PM	7:50 AM - 7:03 PM (Sat); 9:50 AM - 6:00 PM (Sun)	Chico Transit Center Paradise Transit Center	Chico Park and Ride (40x)
Route 41 Paradise Pines - Chico	Magalia / Paradise	5:50 AM - 6:53 PM	9:45 AM - 6:03 PM	Chico Transit Center Paradise Transit Center	--
Route 46 Feather River Hospital	Paradise	9:41 AM - 5:28 PM	--	--	--

Note 1: Service ends at 4:04 PM on Fridays

Source: BCAG, 2013

St). The Chico park and ride lot is served on each run, while the Oroville lot is served on the first two runs of the day out of Oroville and the last three runs into Oroville.

Route 32 is provided on a limited basis, with only two runs per day. The first run of the day leaves Biggs at 6:30 AM and arrives in Chico at 7:40 AM. The return trip leaves the Chico Transit Center at 5:20 PM and arrives in Biggs at 6:30 PM.

Route 40 provides service between the Paradise Transit Center and the Chico Transit Center, and operates Monday through Saturday. During the school year, B-Line operates Route 40x, which is a morning-only commuter run. The route follows Route 40 until it arrives in Chico, where it bypasses Forest Avenue and makes only one stop at the Chico park and ride lot before arriving at the Chico Transit Center. This route leaves Paradise at 6:44 AM and arrives in Chico at 7:35 AM.

Oroville Routes

In addition to the route connecting Chico with Oroville, B-Line operates 4 routes within the Oroville city limits, all of which begin at the Oroville Transit Center in downtown. These routes include:

- Route 24: Thermalito
- Route 25: Oro Dam
- Route 26: Olive Highway
- Route 27: South Oroville

There are also routes connecting Oroville to other communities in Butte County, as follows:

- Route 30: Oroville – Biggs
- Route 31: Paradise – Oroville

Route 31 consists of only two runs per day, Monday through Friday – the outbound run departs Paradise at 6:45 AM and arrives in Oroville at 7:33 AM, and the return trip leaves Oroville at 5:05 PM and arrives in Paradise at 5:56 PM.

Paradise Routes

B-Line only operates one route within Paradise, other than the intercity routes discussed above. This route, Route 46, provides service from the Paradise Transit Center to the Feather River Hospital. There are only three runs per day, starting at 9:41 AM, 1:41 PM and 5:01 PM, operating Monday through Friday only.

Biggs / Gridley Routes

There are no transit routes that operate only within Biggs and Gridley city limits. Local service is provided as part of the intercity routes – Route 30 to Oroville and Route 32 to Chico.

Ridership

In Fiscal Year 2011-2012, the fixed route carried approximately 1,306,431 passengers. B-Line's fixed route ridership accounts for roughly 91 percent of the total passenger-trips systemwide, as shown in Table 13. The majority of the trips (68 percent) were part of the urban service routes, and 32 percent were considered rural service. The paratransit service had a total of 136,117 passenger-trips during the same period. More passengers are using the service in rural areas, with 53 percent in the rural service area and 47 percent in the urban service area.

	One-Way Passenger-Trips	% of Total Trips	Average Daily Ridership
TABLE 13: B-Line Ridership Data for Fiscal Year 2011-2012			
Fixed Route			
Urban Service	892,116	68%	2,887
Rural Service	414,315	32%	1,151
<i>Subtotal: Fixed Route</i>	<i>1,306,431</i>	<i>91%</i>	<i>4,038</i>
Paratransit			
Urban Service	63,491	47%	176
Rural Service	72,626	53%	202
<i>Subtotal: Paratransit</i>	<i>136,117</i>	<i>9%</i>	<i>378</i>
Total B-Line System	1,442,548		4,416
<i>Source: BCAG, 2013</i>			

Ridership on the system has also increased, as shown in Table 14. Overall, 24 percent of the routes saw a decrease in ridership in Fiscal Year 2011-2012 over the previous year. Route 15 (Esplanade / Park / MLK), which is shown as combined 15S and 15N, has the highest ridership of any route with 334,276 one-way trips, followed by Route 20 (Chico – Oroville) with 153,500 trips. Routes that are also carrying a large number of passengers include Route 3 (93,622 one-way trips), Route 4 (92,714 one-way trips) and Route 40 (84,789 one-way trips). Route 20 and Route 40 are both intercity routes to Chico, from Oroville and Paradise, respectively, suggesting that transit is used for regional commuter purposes within Butte County.

Vehicle Fleet and Bus Stop Facilities

B-Line's transit fleet consist of 37 vehicles for the fixed routes, 27 vehicles for the paratransit service, and 9 support vehicles, as shown in Table 15. The age of the fleet (for fixed route and paratransit vehicles) ranges from 2 years to 21 years. Vehicles used for the fixed route have seating capacity of 32 to 45 passengers (without wheelchairs), and each vehicle has space for 2 wheelchairs. Paratransit vehicles range in capacity from 12 to 18 passengers, and all have wheelchair capacity of 3 spaces. The majority of the fixed route vehicles use diesel fuel, however roughly 30 percent of the fleet utilize CNG fuel. The paratransit vehicles are all gasoline powered.

TABLE 14: B-Line Historical Ridership by Route

For routes currently operated by B-Line

	Fiscal Year		% Change
	2010-2011	2011-2012	
Route 2 Mangrove	85,385	81,230	-5%
Route 3 Nord / East	92,452	93,622	1%
Route 4 First / East	91,608	92,714	1%
Route 5 E. 8th Street	79,068	65,656	-17%
Route 7 Bruce / Manzanita	15,866	13,631	-14%
Route 8 Nord	62,532	78,625	26%
Route 9 Warner / Oak	67,180	64,390	-4%
Route 15 Esplanade / Park / MLK	208,628	334,276	60%
Route 16 Esplanade / SR 99	8,818	67,796	669%
Route 20 Chico - Oroville	128,505	153,500	19%
Route 24 Thermalito	17,298	27,586	59%
Route 25 Oro Dam	13,534	15,778	17%
Route 26 Olive Highway	13,379	17,182	28%
Route 27 South Oroville	9,503	15,182	60%
Route 30 Oroville - Biggs	16,164	19,088	18%
Route 31 Paradise - Oroville	5,151	6,166	20%
Route 32 Gridley - Chico	1,767	2,581	46%
Route 40 Paradise - Chico	77,195	84,789	10%
Route 41 Paradise Pines - Chico	57,603	71,665	24%
Route 46 Feather River Hospital	1,021	825	-19%
Total B-Line Fixed Route System	1,052,657	1,306,282	24%

Note: Route 16 initiated in mid 2010-2011
Source: BCAG, 2013

Throughout B-Line's service area, there are approximately 606 bus stops, nearly all of which are signed. Bus stop facilities include 162 shelters and 185 benches. There are three transit centers served by B-Line, located in Chico, Oroville and Paradise:

- The Chico Transit Center is located at 2nd Street and Salem Street in downtown Chico. This facility includes passenger seating, overhead shelter, windscreens, electronic message boards with transit information and parking. Nearly all of the routes serving Chico, both local and intercity routes, stop at this location.

TABLE 15: B-Line Vehicle Fleet Inventory

Make	Model	Year	Fuel Type	Passenger Capacity ¹	Wheelchair Tie Downs	Make	Model	Year	Fuel Type	Passenger Capacity ¹	Wheelchair Tie Downs
Fixed Route Fleet											
Gillig	Phantom	2003	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Gillig	Phantom	2003	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Gillig	Phantom	2003	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Gillig	Phantom	2003	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Gillig	Phantom	2001	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Gillig	Phantom	2001	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Gillig	Phantom	2000	Diesel	35/29	2	Ford	E-450	2002	Gasoline	18/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Orion	Orion V	2000	Diesel	43/37	2	Ford	E-450	2003	Gasoline	12/4	3
Freightliner	MB55	2006	CNG	32/26	2	Ford	E-450	2008	Gasoline	14/6	3
Freightliner	MB55	2006	CNG	32/26	2	Ford	E-450	2008	Gasoline	14/6	3
Freightliner	MB55	2006	CNG	32/26	2	Ford	E-450	2008	Gasoline	14/6	3
Freightliner	MB55	2006	CNG	32/26	2	Ford	E-450	2008	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2008	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2008	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2010	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2010	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2010	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2010	Gasoline	14/6	3
Orion	Orion VII N.G.	2008	CNG	40/33	2	Ford	E-450	2010	Gasoline	14/6	3
Gillig	Low Floor	2011	Diesel	32/25	2	Ford	F250	1995	Gasoline	--	--
Gillig	Low Floor	2011	Diesel	32/25	2	GMC	Jimmy	1999	Gasoline	--	--
Gillig	Low Floor	2011	Diesel	32/25	2	Mercury	Grand Marquis	2001	Gasoline	--	--
Gillig	Low Floor	2011	Diesel	32/25	2	Mercury	Grand Marquis	2001	Gasoline	--	--
Gillig	Low Floor	2011	Diesel	39/31	2	Ford	F250	2002	Gasoline	--	--
Gillig	Low Floor	2011	Diesel	39/31	2	Ford	Impala	2004	Gasoline	--	--
Gillig	Phantom	1992	Diesel	45/39	2	Ford	Escape	2008	Hybrid	--	--
Gillig	Phantom	1992	Diesel	45/39	2	Ford	Escape	2008	Hybrid	--	--
Cable Car Classics	Trolley	1995	Diesel	26/20	2	Ford	E150	2012	Gasoline	--	--
Cable Car Classics	Trolley	1996	Diesel	26/20	2	Ford	F350	2012	Diesel	--	--
Paratransit Fleet											
Support Fleet											

Note 1: Capacity shows without wheelchairs / with wheelchair
Source: BCAG, 2013

- The Oroville Transit Center is located on Spencer Street, behind the Raley's Shopping Center. There is passenger seating and overhead shelter, along with restrooms and parking at the site.
- The transit center in Paradise consists of a shelter located on Almond Street near the Birch Street intersection, and serves as the main stop in the Paradise. It is adjacent to the Paradise Fire Department building.

In addition to the transit centers, there are three main transfer points located in Chico – Pillsbury Road (served by Routes 2, 3 and 4), Lassen and Ceres (served by Routes 2, 7 and 15) and Forest Avenue (served by Routes 5, 7, 15, 20, 40 and 41). These transit centers, as well as the various designated transfer points, are important hubs in the route network.

B-Line Financial Information

Revenues

Table 16 presents the proposed transit operating and capital revenues by source for Fiscal Year 2012-2013, per the proposed approved *Annual Transit Service Plan and Budget*. As indicated in the table, the budgeted sources of funding in the current fiscal year are primarily from local support (59.2 percent), followed by FTA grant funds (24.2 percent) and passenger fares (16.6 percent). The local support includes the Transportation Development Act and State Transit Assistance funds granted generated by each jurisdiction (including the County) for transit services. In total, operating budget revenues total just under \$8.7 million for Fiscal Year 2012-2013.

Capital revenues are also presented in Table 16. As shown, BCAG is expecting to receive FTA 5310 funds for capital purchases in Fiscal Year 2012-2013, totaling \$560,000. The proposed capital TDA reserves amount to \$40,000. Overall, the capital revenues total \$600,000 for the current fiscal year.

Expenses

Proposed expenses related to the operations of the B-Line's fixed-routes and paratransit services for FY 2012-2013 are presented in Table 17. Total operating expenses for the fiscal year totaled \$8,344,569. Operations and maintenance accounted for the greatest expenses, at just over \$7.8 million. Personnel services totaled \$336,679, while general transit expenses totaled \$145,000. The costs to operate the fixed route and paratransit service contract are included.

Cost Allocation Model

When developing and evaluating service alternatives, it is useful to develop a "cost model," which can easily show the financial impact of any proposed changes. Table 17 also presents the FY 2012-2013 cost allocation model for transit operations (both fixed route and paratransit). Each cost item is allocated to that quantity on which it is most dependent. Maintenance costs, for example are allocated to vehicle service miles. This provides a more accurate estimate of

TABLE 16: Butte Regional Transit Operating and Capital Revenues

Fiscal Year 2012-2013, Proposed

Source		Percent of Total
Operating Revenues		
Fixed Route Passenger Fares	\$1,157,600	13.3%
Paratransit Fares	\$283,536	3.3%
<i>Operating Revenues: Subtotal</i>	<i>\$1,441,136</i>	<i>16.6%</i>
Non-Operating Revenues		
<i>Local Support (TDA and STA Funds)</i>		
Butte County	\$1,507,059	17.4%
Biggs	\$7,810	0.1%
Chico	\$2,185,438	25.2%
Gridley	\$23,566	0.3%
Oroville	\$555,471	6.4%
Paradise	\$860,775	9.9%
<i>Local Support: Subtotal</i>	<i>\$5,140,119</i>	<i>59.2%</i>
FTA Grants (5307 and 5311)	\$2,097,098	24.2%
Total Operating Budget Revenues	\$8,678,353	100.0%
Capital Revenues		
ARRA	--	
FTA Grant 5310	\$560,000	93.3%
Prop 1B	--	
Prop 1B - Security	--	
CMAQ Grants - Capital Acquisitions	--	
TDA Capital Reserves	\$40,000	6.7%
Total Capital Funding Sources	\$600,000	100.0%
<i>Source: BCAG Proposed Fiscal Year 2012-2013 Budget</i>		

costs than a simple total-cost-per-vehicle-hour factor, which does not vary with the differing mileage associated with an hour of service on paratransit services versus the fixed-route. Note that the per vehicle-service hour costs are based on the amount identified in the 2012-2017 contract with Veolia Transportation. For FY 2012-2013, this equation is:

$$\begin{aligned}
 \text{Operating Cost} &= \$1.32 \times \text{vehicle service miles} \\
 &+ \$50.32 \text{ per vehicle service hour} \\
 &+ \$481,679 \text{ annually for fixed costs}
 \end{aligned}$$

This equation can be used to estimate the cost of any changes in service, such as the operation of additional routes or changes in service span. It is used as part of this study to evaluate the cost impacts of service alternatives. It should be noted that the cost model does not include depreciation or capital items (such as vehicle purchases) made during the fiscal year.

TABLE 17: Butte Regional Transit Fiscal Year 2012-13 Operating Expenses and Cost Allocation

Line Item	Allocation			Total Expense
	Fixed	Per Hour	Per Mile	
Personnel				
Support Services	\$308,605	\$0	\$0	\$308,605
Paratransit Admin	\$16,974	\$0	\$0	\$16,974
Transit Center Staffing	\$11,100	\$0	\$0	\$11,100
<i>Subtotal: Personnel</i>	\$336,679	\$0	\$0	\$336,679
Operations and Maintenance				
Fixed Route Transportation Services	\$0	\$3,599,345	\$0	\$3,599,345
Paratransit Transportation Services	\$0	\$2,314,329	\$0	\$2,314,329
Fuel	\$0	\$0	\$1,403,797	\$1,403,797
Fleet Insurance	\$0	\$0	\$333,419	\$333,419
Maintenance - Equipment	\$0	\$0	\$200,000	\$200,000
Maintenance - Diesel Emissions Fluid	\$0	\$0	\$12,000	\$12,000
<i>Subtotal</i>	\$0	\$5,913,674	\$1,949,216	\$7,862,890
General Transit				
Communications	\$4,000	\$0	\$0	\$4,000
Office Expense	\$10,000	\$0	\$0	\$10,000
Transportation and Travel (training)	\$4,000	\$0	\$0	\$4,000
Public Relations	\$74,000	\$0	\$0	\$74,000
Maintenance - Structures / Transit Center	\$10,000	\$0	\$0	\$10,000
Transit Center Building Lease	\$18,000	\$0	\$0	\$18,000
Bus Stop Signage and Waste Disposal	\$25,000	\$0	\$0	\$25,000
<i>Subtotal</i>	\$145,000	\$0	\$0	\$145,000
Total Operating Costs	\$481,679	\$5,913,674	\$1,949,216	\$8,344,569
Service Factors		Vehicle Service Hours	Vehicle Service Miles	
		111,943	1,475,963	
Vehicle Service Hour Cost Factor (1)	\$50.32			
Vehicle Service Mile Cost Factor	\$1.32			
Annual Fixed Cost	\$481,679			
<i>Source: BCAG Proposed FY 2012-2013 Budget; BCAG 2011-2012 Operating Data</i>				
<i>Note 1: Per the BCAG / Veolia service contract.</i>				

PUBLIC TRANSIT SERVICES – YUBA SUTTER TRANSIT

As part of this study, it is useful to review Yuba Sutter Transit Authority services, as these services could potentially be an element of a regional network serving Butte County commuters. Ridership patterns of the commuter service also yields useful information with regards to a potential Butte County service.

The Yuba Sutter Transit Authority operates several transit services, consisting of local fixed-route bus service in the Yuba City / Marysville / Linda / Olivehurst area, Dial-A-Ride service in the urban area, rural service to Brownsville, Challenge, Live Oak and Wheatland, and commuter service between Yuba City / Marysville and downtown Sacramento. The commuter service consists of a total of 21 runs per day: 9 runs in the AM commute period, 3 mid-day runs, and 9 runs in the PM commute period. Six of the runs in each of the commute periods serve the Yuba City/SR 99 corridor and three serve the Marysville/SR 70 corridor, while the mid-day runs serve both cities. The mid-day runs along with two runs in each of the commute periods offer service in both directions, while the remaining commute runs operate only to serve Sacramento workers. In downtown Sacramento, the routes all serve a total of eight stops along J Street, 15th Street, and P Street. Total ridership on the commute services was 159,949 in Fiscal Year 2011/12.

Table 18 presents a summary of service times, ridership, and capacity. As shown, the busiest AM runs arrive in downtown Sacramento around 7:30 AM, followed closely by the runs arriving around 6:30 AM. In the PM commute period, ridership is highest on the runs departing around 4:00 PM, generally declining over the later departure times.

Run/Route	Key Schedule Times			Average Passenger Boardings	Bus Capacity		Average % Passenger Load
	Yuba City / Marysville Departure	Sacramento (15th & K)	Yuba City / Marysville Arrival		41 psgrs	57 psgrs	
1st 99	5:20	6:30	7:20	34		X	60%
1st 70	5:30	6:30	--	35	X		85%
2nd 99	5:35	6:45	--	18	X		44%
2nd 70	5:55	6:55	--	29	X		71%
3rd 99	6:00	7:00	--	27	X		66%
4th 99	6:10	7:20	8:10	43		X	75%
5th 99	6:25	7:35	--	36		X	63%
3rd 70	6:35	7:47	--	43		X	75%
6th 99	6:45	7:52	--	28	X		68%
1st Midday	7:55	9:05	10:00	23	X		56%
2nd Midday	11:00	12:07	1:30	24	X		59%
3rd Midday	1:00	2:07	3:30	23	X		56%
1st 99	--	3:52	5:05	55	X	X	56%
2nd 99	--	4:07	5:20	40		X	70%
1st 70	--	4:12	5:20	43		X	75%
3rd 99	3:00	4:27	5:40	35		X	61%
2nd 70	--	4:42	5:50	26	X		63%
4th 99	--	4:47	6:00	29	X		71%
5th 99	--	5:07	6:20	26	X		63%
3rd 70	--	5:12	6:20	16	X		39%
6th 99	4:15	5:22	6:35	9	X		22%
Total AM				293			68%
Total Midday				70			57%
Total PM				279			59%

Source: Yuba-Sutter Transit, 2013

Yuba-Sutter Transit uses a mix of 41-passenger and 57-passenger buses, including a fleet of six over-the-road coaches. Two buses are used on the most popular PM commute run in order to provide adequate capacity. Roughly 70 percent of the seating capacity is used in the AM commute period, and 60 percent in the mid-day and PM commute period.

Other observations regarding the Yuba-Sutter commute service that are useful in assessing the potential for service from Butte County are as follows:

- Services were previously offered to other destinations in the Sacramento area (UC Davis Med Center) but were found to not be effective.
- An estimated 80 percent of riders are State of California employees. Some are Sacramento residents that work at the Caltrans District 3 offices in Marysville, riding in the "reverse" direction.
- Many commuters work 4 10-hour days a week. As a result, ridership is highest on Mondays through Thursdays, and roughly 40 percent lower on Fridays. Monthly passes are priced based upon 16 round-trips per month, rather than the more common 20-21 round-trips per month.
- While ridership on the mid-day runs are relatively low, passengers indicate that the availability of mid-day runs to return home in case of emergency is an important consideration in their decision to use the transit service.
- Yuba-Sutter Transit plans the service for a 75 percent average seating capacity factor (on Mondays through Thursdays). It has been found that higher seating utilization tends to reduce ridership, as passengers are unsure that a seat will always be available.
- With 3-position bike racks on the front of the buses and the ability to carry bikes in the lower luggage areas on the over-the-road coaches, lack of adequate capacity to accommodate bikes is only an infrequent issue. By policy, bikes are allowed in the bus on the last run of each commute period if necessary.

OTHER REGIONAL TRANSPORTATION PROVIDERS

Greyhound

Greyhound bus service operates in Butte County, serving both Chico and Oroville. There are two departures daily from Chico to Sacramento, leaving the station at 450 Orange Street at 11:30 AM and 7:15 PM. In Oroville, buses depart the station at 890 Oro Dam Boulevard at 12:10 PM and 7:55 PM. Return trips to both locations from Sacramento depart at 7:30 AM and 6:45 PM. Given these schedules, Greyhound is not an option for Butte County commuters into Sacramento.

Amtrak

Amtrak's *Coast Starlight* serves the Chico Train Station with one departure in each direction as part of the long route between Seattle and Los Angeles. The station is located in Chico at 450 Orange Street. The train departs Chico for Sacramento at 3:50 AM, and the return trip departs Sacramento at 11:59 PM.

Amtrak Thruway bus service is also provided, as part of the *Capital Corridor* rail service between Sacramento and San Jose. Buses depart Chico at 7:50 AM, 11:25 AM, 2:20 PM and 4:05 PM. Return trips from Sacramento depart at 10:15 AM, 12:45 PM, 3:40 PM and 6:30 PM. The Amtrak Thruway bus is also available in Oroville, departing the Park and Ride lot at Grand Avenue and 3rd Street at 8:15 AM, 11:50 AM, 2:45 PM and 4:30 PM. Return trips are the same as the bus for Chico. As with many other rural areas served by the Thruway service, in order to buy a ticket for the bus, the passenger must have also purchased a rail ticket (for travel beyond Sacramento). The train schedule is not conducive to commuting between Chico and Sacramento, and the bus service is not an option due to the purchased train ticket requirement.

EXISTING INFRASTRUCTURE

Roadway Network

The roadway network is an important component of regional travel, for both recreational and commute purposes. Butte County is served by two major north-south highways running through it – SR 99 and SR 70. Both roadways start in the south of the county, with SR 99 traveling through Gridley and SR 70 through Oroville. Just north of Oroville, SR 70 intersects SR 99; SR 70 turns northeast and continues into Plumas County, while SR 99 travels north to Chico and the northern areas of the County. The corridor between SR 99 and SR 70 is a main thoroughfare in Butte County, as it connects Oroville with Chico and is the route to Sacramento and Yuba Counties to the south.

Travel Pattern Evaluation and Traffic Model Analysis

BCAG maintains an advanced traffic model, encompassing the entirety of Butte County. Using the TransCAD model software, this model provides information regarding travel patterns that is useful in understanding existing travel patterns that could use a commuter bus service, as well as forecasts of future travel patterns. The model estimates the number of vehicle-trips between a total of 2,181 Traffic Analysis Zones (TAZs) within the county as well as to roadways leading into and out of the county. This data was summarized into areas that encompass the key communities within Butte County (as well as the remainder of the county) and the trips to/from SR 70 and SR 99 to the south. (While these areas are named for the largest community in the region, they encompass outlying developed areas beyond the municipal boundaries.) Note that, for "external trips" entering and leaving the county, these trips are for all purposes (not just commuting). Also, specific trip destinations south of the Butte County line (such as Yuba City, Marysville or Sacramento) are not defined in the model. For purposes of this study, the forecasts were reviewed for the 2010 and 2020 ("Balanced scenario" with 4D adjustments) planning years, and for the total day, the AM peak period (6 AM to 9 AM), and the PM peak period (3 PM to 7 PM).

Table 19 presents the summary of trips estimated for 2010. A review of this information reveals the following findings pertinent to this study:

- Total daily vehicle-trips between Butte County and SR 70 and SR 99 to the south is estimated to be 26,260 one-way trips. Of this total, 38 percent is on SR 70 and 62 percent is on SR 99.
- The largest proportion of daily trips (39 percent, or a total of 10,190) to/from the south is generated by the Oroville area, followed by the Paradise area (24 percent, or 6,318). Trips to/from Chico are relatively low, at 16 percent (4,188).
- Not surprisingly, traffic generated in the Oroville area largely uses SR 70 (91 percent), while the Biggs, Chico, Gridley and Paradise area traffic largely uses SR 99 (96 to 99 percent).
- Considering the AM peak period travel, there are a total of 537 southbound trips and 514 northbound trips. These traffic flows closely balance, with 51 percent southbound versus 49 percent northbound. The greatest southbound directional split is associated with trips generated in Chico (56 percent southbound), while Biggs and the portions of the county outside the larger communities actually have more northbound traffic in the AM peak period than southbound traffic.
- The proportion of traffic generated in Butte County using each of the two routes in the AM peak period is identical to that for the day as a whole (38 percent on SR 70 and 62 percent on SR 99).
- Focusing on the AM southbound travel (as the best indicator of commuter patterns), the largest proportion of travel south out of the county is generated by the Oroville area (39 percent), followed by Paradise (24 percent) and Chico (18 percent). The largest single trip volume is between Oroville and SR 70 entering Yuba County, with 195 vehicle-trips.
- PM peak period traffic volumes are substantially higher than AM peak period traffic volumes, with 2,740 southbound and 2,775 northbound trips. Trip patterns, in terms of relative use of the two highways and relative trip generation within the county, are very similar to those in the AM peak period.

Table 20 presents the forecast traffic volumes for 2020, while Table 21 presents a comparison of the estimated 2010 volumes with the forecast 2020 volumes. This information indicates the following:

- Total daily traffic volumes generated within Butte County and traveling to/from the south is forecast to increase by 18 percent between 2010 and 2020, both on SR 70 and on SR 99. The largest growth is forecast to be generated by the Oroville area, which is forecast to increase by 3,108 trips (31 percent increase) over the two highways, consisting of 1,992 trips (22 percent increase) on SR 70 and 1,206 trips (126 percent increase) on SR 99. Daily trips between the southern Butte County line and Chico are forecast to drop by 844 trips, or 20 percent. This is probably a result of increased balance between trip origins and destinations in the Chico area.

TABLE 19: Travel Model Vehicle-Trips -- 2010

	Southbound: Exiting Butte County				Northbound: Entering Butte County			
	Total SR 70 and SR 99		% By Route		Total SR 70 and SR 99		% By Route	
	SR 70	SR 99	SR 70	SR 99	SR 70	SR 99	SR 70	SR 99
		% By Community				% By Community		
Daily								
Biggs	3	245	1%	99%	3	245	1%	99%
Chico	72	2,021	3%	97%	72	2,021	3%	97%
Gridley	23	1,447	2%	98%	23	1,447	2%	98%
Oroville	4,616	479	91%	9%	4,616	479	91%	9%
Paradise	125	3,035	4%	96%	125	3,035	4%	96%
Remainder of County	156	907	15%	85%	156	907	15%	85%
Total: Butte County	4,995	8,135	38%	62%	4,995	8,135	38%	62%
AM Peak Period								
Biggs	0	9	1%	99%	0	11	1%	99%
Chico	2	92	3%	97%	3	69	5%	95%
Gridley	1	62	1%	99%	1	54	2%	98%
Oroville	195	16	93%	7%	174	23	89%	11%
Paradise	4	126	3%	97%	6	117	5%	95%
Remainder of County	3	26	11%	89%	9	46	16%	84%
Total	205	331	38%	62%	194	319	38%	62%
PM Peak Period								
Biggs	1	53	1%	99%	1	51	1%	99%
Chico	16	407	4%	96%	14	442	3%	97%
Gridley	5	297	2%	98%	5	310	1%	99%
Oroville	954	106	90%	10%	985	96	91%	9%
Paradise	28	631	4%	96%	24	644	4%	96%
Remainder of County	37	205	15%	85%	29	176	14%	86%
Total	1,041	1,699	38%	62%	1,057	1,717	38%	62%

Source: BCAG TransCAD Model

TABLE 20: Travel Model Vehicle-Trips -- 2020

	Southbound: Exiting Butte County					Northbound: Entering Butte County					
	Total SR 70 and SR 99		% By Route			Total SR 70 and SR 99		% By Route			
	SR 70	SR 99	SR 70	SR 99	Community	SR 70	SR 99	SR 70	SR 99	Community	
Daily											
Biggs	2	355	1%	99%	2%	2	355	1%	99%	2%	
Chico	29	1,642	2%	98%	11%	29	1,642	2%	98%	11%	
Gridley	16	1,973	1%	99%	13%	16	1,973	1%	99%	13%	
Oroville	5,612	1,082	84%	16%	43%	5,612	1,082	84%	16%	43%	
Paradise	71	3,460	2%	98%	23%	71	3,460	2%	98%	23%	
Remainder of County	138	1,063	11%	89%	8%	138	1,063	11%	89%	8%	
Total: Butte County	5,869	9,575	38%	62%	100%	5,869	9,575	38%	62%	100%	
AM Peak Period											
Biggs	0	13	0%	100%	2%	0	16	1%	99%	3%	
Chico	1	75	1%	99%	12%	1	56	2%	98%	10%	
Gridley	0	83	1%	99%	13%	1	75	1%	99%	13%	
Oroville	236	44	84%	16%	44%	213	42	83%	17%	42%	
Paradise	2	145	1%	99%	23%	4	132	3%	97%	23%	
Remainder of County	3	31	9%	91%	5%	8	54	13%	87%	10%	
Total	243	392	38%	62%	100%	227	374	38%	62%	100%	
PM Peak Period											
Biggs	0	77	1%	99%	2%	0	73	1%	99%	2%	
Chico	7	330	2%	98%	10%	6	359	2%	98%	11%	
Gridley	4	408	1%	99%	13%	3	421	1%	99%	13%	
Oroville	1,161	225	84%	16%	43%	1,196	229	84%	16%	44%	
Paradise	16	717	2%	98%	23%	14	736	2%	98%	23%	
Remainder of County	33	240	12%	88%	8%	25	206	11%	89%	7%	
Total	1,221	1,997	38%	62%	100%	1,245	2,024	38%	62%	100%	

Source: BCAG TransCAD Model

TABLE 21: Travel Model Vehicle-Trips -- Change from 2010 to 2020

	Southbound: Exiting Butte County					Northbound: Entering Butte County				
	SR 99		SR 70		% By Community	SR 99		SR 70		% By Community
	Total	% Change	Total	% Change		Total	% Change	Total	% Change	
Daily	110	-26%	109	45%	44%	110	-26%	109	45%	44%
Biggs	-1	-43	-422	-19%	-20%	-379	-43	-422	-19%	-20%
Chico	-7	-29%	519	36%	35%	526	-7	519	-29%	36%
Gridley	996	22%	1599	126%	31%	603	996	1599	22%	126%
Oroville	-53	-43%	372	14%	12%	425	-53	372	-43%	14%
Paradise	-18	-12%	138	17%	13%	156	-18	138	-12%	13%
Remainder of County	875	18%	2315	18%	18%	1440	875	2315	18%	18%
Total: Butte County										
AM Peak Period	4	-29%	4	41%	41%	5	0	5	-25%	48%
Biggs	-1	-61%	-18	-18%	-19%	-13	-2	-15	-58%	-19%
Chico	0	-33%	21	34%	33%	21	0	21	-27%	39%
Gridley	41	21%	70	182%	33%	20	38	58	22%	87%
Oroville	-2	-44%	18	15%	14%	15	-3	12	-42%	12%
Paradise	0	-13%	4	18%	15%	8	-1	7	-11%	16%
Remainder of County	37	18%	98	18%	18%	54	33	87	17%	17%
Total										
PM Peak Period	24	-26%	24	46%	45%	22	0	22	-27%	44%
Biggs	-9	-59%	-86	-19%	-20%	-82	-9	-91	-60%	-19%
Chico	-1	-29%	109	37%	36%	110	-1	109	-30%	36%
Gridley	207	22%	327	113%	31%	133	211	345	21%	140%
Oroville	-12	-42%	74	14%	11%	93	-10	82	-43%	14%
Paradise	-4	-11%	30	17%	13%	31	-3	27	-12%	17%
Remainder of County	180	17%	478	18%	17%	307	187	494	18%	18%
Total										

Source: BCAG TransCAD Model

- AM peak period trips are forecast to increase by 18 percent in the southbound direction (98 trips) and 17 percent in the northbound direction (87 trips). Focusing on the southbound direction, the largest portion of this increase is generated by the Oroville area (70 southbound, corresponding to a 33 percent increase). Travel to/from the Gridley and Paradise areas will grow only slightly (21 and 18 southbound trips, respectively), while Chico southbound AM trips will decline by 18 (or 19 percent). Growth in SR 99 southbound traffic (61 trips) will be greater than growth in SR 70 southbound traffic (37 trips)
- PM peak period trips are forecast to grow by 17 percent in the southbound direction (478 trips) and 494 in the northbound direction (18 percent). Though the volume changes are larger, changes in the PM peak period trip patterns parallel those in the AM peak period, with the largest growth generated by the Oroville area along with a reduction in external traffic generated by the Chico area.

While this information does not directly correspond with commuter demand (as it reflects trips made for all purposes), it does indicate the relatively importance of the Oroville and Paradise areas as generators of southbound-out-of-county commuter trips compared with Chico, which will become even greater over time as Oroville/Paradise trips increase while Chico trips decline.

Park and Ride Facilities

There are two official Caltrans Park and Ride facilities in Butte County: one in Chico and one in Oroville. In addition, another informal facility is located in Paradise. The Chico Park and Ride is located at Fir Street and SR 32, just east side of SR 99. There are 73 parking spaces, including handicapped spaces, and 8 bike lockers available. This facility is currently served by B-Line Routes 5, 20 and 40x (one morning run per day). The Oroville facility is located at the northeast corner of Grand Avenue and Third Street. This Park and Ride lot has 30 spaces, and no bike lockers available. Transit service is provided through B-Line's Route 20, as well as the Amtrak Thruway bus. The Paradise park and ride location is on Skyway Road at Fir Street, and contains approximately 25 spaces, including handicapped spaces.

Introduction

Potential demand for intercity transit service can be evaluated through several means, including review of passenger requests (through the Unmet Needs Hearing process), surveys, standard models, and review of existing “peer” transit programs serving Sacramento.

Unmet Needs Hearing

The California Transportation Development Act (TDA) requires annual unmet transit needs hearings if a jurisdiction proposes to spend some TDA funds on streets and roads. The TDA is a primary source of funding for public transit in Butte County. The TDA law requires that definitions for the terms “unmet transit needs” and “reasonable to meet”. BCAG’s definitions were adopted in 1994 and amended in 2003, as follows:

- Unmet Transit Needs Definition: *“Unmet transit needs are those trips required, but currently not provided, and not scheduled to be provided within Butte County for individuals dependent on public transit to maintain a minimum standard of living”.*
- Reasonable to Meet Definition: *“Reasonable to meet shall include all of the following factors:*
 1. *Cost Effectiveness: The cost to provide the service will meet the minimum farebox recovery ratio.*
 2. *Economy: The project can be implemented at a reasonable cost.*
 3. *Community Acceptance: Support exists, indicated through the public hearing process.*
 4. *Operational Feasibility: The service must be safe to operate.”*

The BCAP board is also required, per TDA, to make certain findings. These include that 1) there are no unmet transit needs, 2) there are no unmet needs that are reasonable to meet, and 3) there are unmet transit needs, including needs that are reasonable to meet.

The following is a summary of the unmet transit needs from the last three fiscal years available – FY 2011-2012, 2012-2013 and 2013-2014.

Unmet Needs – Fiscal Year 2011-2012

The Unmet Needs hearing process for Fiscal Year 2011-2012 and subsequent Needs Assessment was adopted in January 2011. The unmet needs from testimony included service expansion to areas like Stirling City and Berry Creek that are not currently served, new stops along existing routes, and new routes (including to the Chico Airport) within the current service area. After review of the unmet needs, the Board determined that there were no unmet needs that were reasonable to meet for Fiscal Year 2010-2011.

Unmet Needs – Fiscal Year 2012-2013

In February 2012 the BCAG board adopted the Needs Assessment for the 2012-2013 Fiscal Year. Unmet needs included service expansion to Stirling City and connections to Yuba Sutter Transit in Live Oak, new service within the existing service area, more Saturday and Sunday service, extended service hours and more frequent service. The Board determined that none of the unmet needs were reasonable to meet for the 2012-2013 Fiscal Year.

Unmet Needs – Fiscal Year 2013-2014

The Draft Transit Needs Assessment for Fiscal Year 2013-2014 was adopted in February 2013. Requests were made for expanded service to new areas, new stops and routes within existing service areas, additional service midday, more Saturday and Sunday service, and extended operating hours. After review of the comments, the BCAG board found that there was one unmet need reasonable to meet – to add an additional run on Route 7 midday serving east Chico.

Online Survey Results

In April and May of 2013, LSC Transportation Consultants, Inc designed a survey for commuters out of Butte County, which was available online at www.surveymonkey.com. The survey was advertised through print newspapers in Chico (Chico Mercury Register) and Oroville (Oroville Mercury Register); on the Oroville / Chico Mercury Register's website; on the Yuba-Sutter TMA website; and through the Yuba-Sutter commuter email blast. Additionally, flyers were posted at the three park and ride lots located in Butte County (Chico, Oroville and Paradise). Copies of the advertisements and flyers are presented in Appendix A.

The survey offered 21 questions regarding work location, current commute travel modes, work schedules, and other commute/work related topics. In total, there were 39 responses. A summary of the survey responses is provided below.

- Approximately 56 percent of respondents said they work in the City of Sacramento. Another 8 percent each commuted to Yuba City or Marysville, and 10 percent commuted to other locations such as Olivehurst or Live Oak.
- Roughly 49 percent of the respondents work in downtown Sacramento, and 56 percent work for the State of California.
- Commuters that drove alone comprised roughly 41 percent of the respondents, while 26 percent carpooled. Thirty-six percent of the respondents stated they used Yuba-Sutter Transit's commuter route; this included some respondents who also either drove alone or carpooled.
- Of the carpoolers, 23 percent used the existing Park and Ride lots in Butte County.
- Nearly three-quarters of the respondents (74 percent) work five days per week. Only 5 percent work 4 days per week, 3 percent work 3 days per week, and another 3 percent work 2 days per week.

- Regarding the start of the work day, 38 percent of respondents start work in the 7:00 AM hour and 21 percent in the 8:00 AM hour. Another 15 percent begin work during the 6:00 AM hour and 3 percent in the 9:00 AM hour.
- Forty-four percent of respondents leave work in the 4:00 PM hour, 18 percent during the 3:00 PM hour and 15 percent in the 5:00 PM hour. Roughly 5 percent stated other.
- Approximately 62 percent of respondents said that their employer allows for a flexible work schedule, indicating a higher likelihood of using transit as their schedules could be altered to allow for transit.
- Another indicator of transit use likelihood is whether a person needs their car during the work day. Approximately 49 percent of respondents stated that they never need their car during the work day, while 28 percent sometimes need their car and 7 percent always need their car.
- Roughly 74 percent of respondents did not have to pick up or drop off children as part of their commute trip, while 13 percent responded “sometimes”.
- If there was an intercity bus service to Sacramento for commuters, 85 percent of respondents stated they would use the service. Ten percent stated they would not use it, and the remaining respondents did not answer (did not apply or chose not to answer).
- When asked how often they would use a Sacramento commuter service, 28 percent would use it 5 days per week, 26 percent would use it 4 days per week and 23 percent would use it infrequently. Five percent stated they would use the service 2 to 3 days per week, and another 5 percent would use it once per week.
- Approximately 59 percent of respondents said their employer offers reimbursement for transit passes, while 13 percent said that was not an option. Another 10 percent did not know if their employer offered the reimbursement and 8 percent stated it did not apply.
- Roughly two-thirds of respondents (67 percent) stated that they have other needs for a commute service to Sacramento, beyond travel to work. Over one-half (56 percent) would use the service for access to the airport and 36 percent for recreation. Medical trip needs comprised 28 percent of the responses, as did visiting friends and family. This was followed by access to Amtrak (26 percent), personal business (18 percent), work errands (10 percent), and shopping (5 percent).
- The survey also asked if there were other needs for transit from Butte County to Yuba City or Marysville outside of commute purposes. Over one-half (51 percent) answered “no” and 41 percent answered “yes”. Thirty-one percent would use the service to visit friends and family, 26 percent for recreation, and another 26 percent for personal business. Medical trips comprised 18 percent of the responses, followed by work errands (13 percent), access to Amtrak (8 percent) and visiting friends and family (3 percent).

- When asked if they were aware of the existing Yuba-Sutter Transit commuter route to Sacramento from Yuba City/Marysville, 67 percent knew that the service operated.
- Roughly 82 percent of respondents thought that a commuter service to Sacramento from Butte County should be operated via Yuba City/Marysville.
- The survey asked for the respondent's home zip code, in order to identify where people are commuting from. Approximately 44 percent had a zip code in Chico, 18 percent in Oroville, 13 percent in Gridley and 5 percent in other areas of Butte County. Approximately 13 percent of respondents were from areas outside of the County, including Marysville, Olivehurst, Sutter, Oregon House and San Francisco.

Overall, this survey indicates that respondents have several characteristics that tend to increase potential use of a commuter service, specifically:

- A high proportion work for a single employer (State of California) that has active programs to encourage transit commuting, including financial support for annual transit passes.
- Respondents indicate relatively consistent work schedules, an interest in using the service four to five days a week, as well as flexibility in work hours that could help to match work hours with bus service times.
- The preponderance of respondents indicated that they do not require a car at work and they do not need to drop off or pick up children as part of their commute trip, both which indicate a relatively high potential to use a transit service.
- While it should be noted that respondents were "self selected" and typically tend to reflect persons more interested than all commuters in a potential transit service, the fact that 85 percent indicated a desire to see the service started indicates a strong interest.

The survey responses suggest that there is a need for transit service to Sacramento from Butte County. In particular, it indicates that service would be of greatest benefit by either stopping in Yuba City/Marysville in both directions, or providing a connecting service to Yuba-Sutter Transit's existing commute route to Sacramento.

Employee / Commuter Transit Demand

The Transit Cooperative Research Project B-36 study, *Methods for Forecasting Demand and Quantifying Need for Rural Passenger Transportation*, includes methods for determining commute between rural areas and more urbanized areas (such as Sacramento). This methodology is based upon observed transit ridership between outlying counties and center city employment centers across the nation. Overall, the study identified a median "transit mode split" (the proportion of all commute travel occurring on transit modes) of 1.2 percent.

It should be emphasized that this methodology represents typical observed transit use, on a county-wide basis. It can be considered to be a valid figure for the Butte County – to – Yuba City/Marysville commute market, as well as commuting into Butte County. However, there are

several factors that indicate that a direct application of this mode split to the total Butte County-to-Downtown Sacramento commute data would underestimate actual potential demand:

- With a strong concentration of employment within a small, walkable area, transit potential is higher than for an equivalent number of commuters spread over an entire urbanized count.
- The fact that Sacramento represents one of the greatest concentration of public sector employees outside of Washington, DC, indicates a relatively high potential for transit use, given the consistent work schedules, flexibility in individual work hours, limited need for vehicles during the day, and financial subsidy of commuter's transit pass purchases.

Peer System Review

A final means of evaluating transit ridership potential is to assess the transit mode split for other existing commuter transit services serving the downtown Sacramento employment center. A review of the various services indicates two such systems that yield useful information comparable to the Butte County – Sacramento travel market:

- As discussed in Chapter 3, above, the Yuba Sutter Transit Authority provides a high level of commuter service along the US 99 and SH 70 corridors. Dividing the average weekday ridership (approximately 260 individual commuters making round-trips per day, excluding Butte County residents) by the total number of Yuba and Sutter County residents commuting to downtown Sacramento (1,430 persons, per the Longitudinal Employer-Household Dynamic dataset), the transit mode split is found to be 18.2 percent.
- The El Dorado County Transit Authority operates a similar system, providing 11 round-trips daily between Placerville, El Dorado Hills and downtown Sacramento. This program serves an average of approximately 230 commuter round-trips per day. Dividing by the 1,932 El Dorado County residents working in the downtown Sacramento area, the transit mode split is calculated to be 11.9.

The distance between Placerville or Yuba City / Marysville and downtown Sacramento is approximately 44 miles, however Chico to downtown is roughly double the distance. Based on the figures above, and considering that longer commutes yield a relatively high benefit of transit service over private auto commuting (given the cost of long auto commutes and the strain of long-distance driving), a conservatively low estimate of transit mode split for the Butte County – downtown Sacramento travel market is 18.2 percent.

Table 22 shows the commute demand for workers traveling into and out of the Study Area, applying the 1.2 percent transit mode figure for commuting demand to/from the Yuba City/Marysville area and the 18.2 percent transit mode figure for commuting demand to downtown Sacramento. The analysis includes commuters from Butte County to downtown Sacramento and Yuba City, as well as commuters into Butte County from these outside locations.

TABLE 22: Butte County Commuter Transit Demand

Study Area Location and Destination	# Persons Commuting			Potential Demand (One-Way Pass. Trips)		
	From Study Area	To Study Area	Total	From Study Area	To Study Area	Total Demand
Between Chico and.....						
Downtown Sacramento	292	44	336	53	1	54
Yuba City	367	396	763	4	5	9
Marysville	164	84	248	2	1	3
Between Oroville and.....						
Downtown Sacramento	80	11	91	15	0	15
Yuba City	84	177	261	1	2	3
Marysville	59	43	102	1	1	1
Between Biggs and.....						
Downtown Sacramento	12	1	13	2	0	2
Yuba City	23	6	29	0	0	0
Marysville	9	2	11	0	0	0
Between Gridley and.....						
Downtown Sacramento	34	2	36	6	0	6
Yuba City	175	152	327	2	2	4
Marysville	57	22	79	1	0	1
Between Paradise and.....						
Downtown Sacramento	97	8	105	18	0	18
Yuba City	99	70	169	1	1	2
Marysville	53	12	65	1	0	1
Between Remaining County and.....						
Downtown Sacramento	174	4	178	32	0	32
Yuba City	541	175	716	6	2	9
Marysville	275	43	318	3	1	4
Between Total Butte County and.....						
Downtown Sacramento	689	70	759	125	1	126
Yuba City	1,289	976	2,265	15	12	27
Marysville	617	206	823	7	2	10

Source: TCRP B-36 Study; US Census Bureau.

Overall, the analysis indicates that there is a total commute demand of 125 one-way trips to downtown Sacramento from Butte County. The greatest ridership to downtown Sacramento would be generated from the city of Chico, with 53 one-way passenger trips per day, followed

by outlying areas of the County (likely in locations directly adjacent to Chico or Oroville) with 32 passenger-trips.

As shown, there is a less significant demand for commuter transit into Yuba City and Marysville from the study area. The analysis shows a demand of roughly 15 passenger-trips to Yuba City and only 7 trips to Marysville. In the reverse direction, approximately 12 passenger-trips are estimated from Yuba City into Butte County, and only 2 passenger-trips from Marysville.

On-line Survey Advertising and Flyer

Should there be a commuter bus to Sacramento?

If you commute to Sacramento, Yuba City or Marysville, please help the Butte County Association of Governments by participating in an online survey regarding a potential commuter bus service from Butte County to Sacramento!

The survey is available at
www.surveymonkey.com/s/butte.

**Thank you for your
participation!**



Butte County Commuter Bus Online Survey



WHO?

The Butte County Association of Governments (BCAG) is asking commuters to help by completing an online survey. We're looking for commuters traveling to Sacramento or Yuba City / Marysville. Butte County residents traveling to these areas for other purposes are also encouraged to take the survey.

WHAT AND WHY?

BCAG is conducting a feasibility study for a potential commuter bus service between Butte County and Sacramento. Your input is a key piece in determining if the service is a viable option for residents of the County.

WHERE?

The survey is available at <https://www.surveymonkey.com/s/butte>

ATTACHMENT B
Technical Memorandum 2: Alternatives Analysis

Butte County Inter-City Commuter Bus Feasibility Study

Technical Memorandum Two: Alternatives Analysis



Prepared for the
Butte County Association of Governments

Prepared by



LSC Transportation Consultants, Inc.

Inter-City Commuter Bus Feasibility Study

Technical Memorandum 2: Alternatives Analysis

Prepared for the:

Butte County Association of Governments
250 Sierra Sunrise Terrace, Suite 100
Chico, California 95928
530 ♦ 879-2468

Prepared by:

LSC Transportation Consultants, Inc.
2690 Lake Forest Road, Suite C
P.O. Box 5875
Tahoe City, California 96145
530 ♦ 583-4053

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A key step in the development of a transit plan is the analysis and evaluation of alternatives for the operation of public transit in the study area. Such an analysis requires consideration of a number of factors, including service, capital (vehicles, facilities, and other equipment), institutional and management, and financial alternatives. This document presents a discussion of each of these factors.

The discussion presented in Chapters 2 through 5 is not intended to identify a recommended course of action. Rather, this *Technical Memorandum* outlines the options available to the Butte County Association of Government and B-Line, and explains the advantages and disadvantages of each option. This discussion will provide the basis for recommending a course of action to be presented in the Draft Plan to follow.

The service, capital and financial alternative presented are a means to address the potential needs of the new service. This includes, in particular, new vehicles required, additional staff and possible funding sources.

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The basis for any transit plan is the development of an effective and appropriate service strategy. The types of service provided, their schedules and routes, and the quality of service can effectively determine the success or failure of a transit organization.

Following an examination of the existing conditions of transit service and potential needs / demand for commuter service, a number of service alternatives have been evaluated and are presented in this chapter. The service alternatives are specifically intended to present multiple options for commuter service to Sacramento, with varying levels of financial impacts to BCAG. Each service alternative is described, including operating characteristics, financial characteristics, and capital requirements.

COMMUTER SERVICE ALTERNATIVES

Based on the evaluation of ridership demand and standard transit planning principals, a series of service alternatives were developed and evaluated. Individual service elements are first assessed, and then combined into a series of overall service package alternatives.

Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs

If commuter service were to be implemented, a reasonable minimum level of service would be to operate two southbound runs for the morning commute period and two northbound runs in the evening commute period. (Operating only a single run in each commute period has been found to generate poor ridership, as passengers have no options for travel times.) In order to avoid paying drivers for their time throughout the day in Sacramento, both drivers would return to Chico at the end of the second morning run. One bus would be left in downtown Sacramento during the mid-day, in order to minimize mileage on the fleet. The driver of the first run would park the bus and return to Chico on the second bus. In the afternoon, one driver would ride southbound as a passenger, and then wait until the second northbound departure time. Drivers would be paid for this deadhead time, but the costs of this additional deadhead time is less than the avoided costs of the additional fuel and maintenance costs on the second vehicle. As the incremental cost of running the "off-direction" run while carrying passengers over that of operating out-of-service is minimal (a few additional minutes to serve stops), these morning northbound and afternoon southbound runs would be open to riders.

Table 1 presents a reasonable example service schedule for this alternative. Commute period schedule times are selected based upon the AM arrival times and PM departure times in Sacramento that generate the greatest ridership on existing commuter services. These times provide for an 8-hour to 9-hour work day in Sacramento.

Starting at the Chico Transit Center, this route would serve the Park-and-Ride at Fir Street, stop in Oroville (at the Transit Center and possibly at another park-and-ride lot), at Robinson's Corner (intersection of SR 70 and East Gridley Road, to serve Gridley/Biggs and Palermo

residents), the Caltrans District 3 building in Marysville, and a series of eight stops in downtown Sacramento, along J Street, 15th Street, and P Street).¹ This is shown graphically in Figure 1.

TABLE 1: Example Schedule of Chico - Oroville - Marysville - Sacramento Service, 2 AM and 2 PM Runs			
Southbound			
Chico (Transit Center)	5:19 AM	5:49 AM	1:49 PM
Chico (Fir St. PnR)	5:25 AM	5:55 AM	1:55 PM
Oroville (Transit Center)	5:53 AM	6:23 AM	2:23 PM
Robinsons Corner (70/E. Gridley Rd)	6:06 AM	6:36 AM	2:36 PM
Marysville (Caltrans)	6:25 AM	6:55 AM	2:55 PM
Sacramento (15th&K)	7:20 AM	7:50 AM	3:50 PM
Northbound			
Sacramento (15th&K)	8:05 AM	4:05 PM	4:35 PM
Marysville (Caltrans)	9:00 AM	5:00 PM	5:30 PM
Robinsons Corner (70/E. Gridley Rd)	9:13 AM	5:13 PM	5:43 PM
Oroville (Transit Center)	9:32 AM	5:32 PM	6:02 PM
Chico (Fir St. PnR)	10:00 AM	6:00 PM	6:30 PM
Chico (Transit Center)	10:06 AM	6:06 PM	6:36 PM
Total Daily Service Quantities			
In-Service Vehicle-Hours	12.10		
Driver Deadhead Hours	5.53		
In-Service Vehicle-Miles	564		
Source: LSC Transportation Consultants, Inc.			

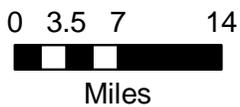
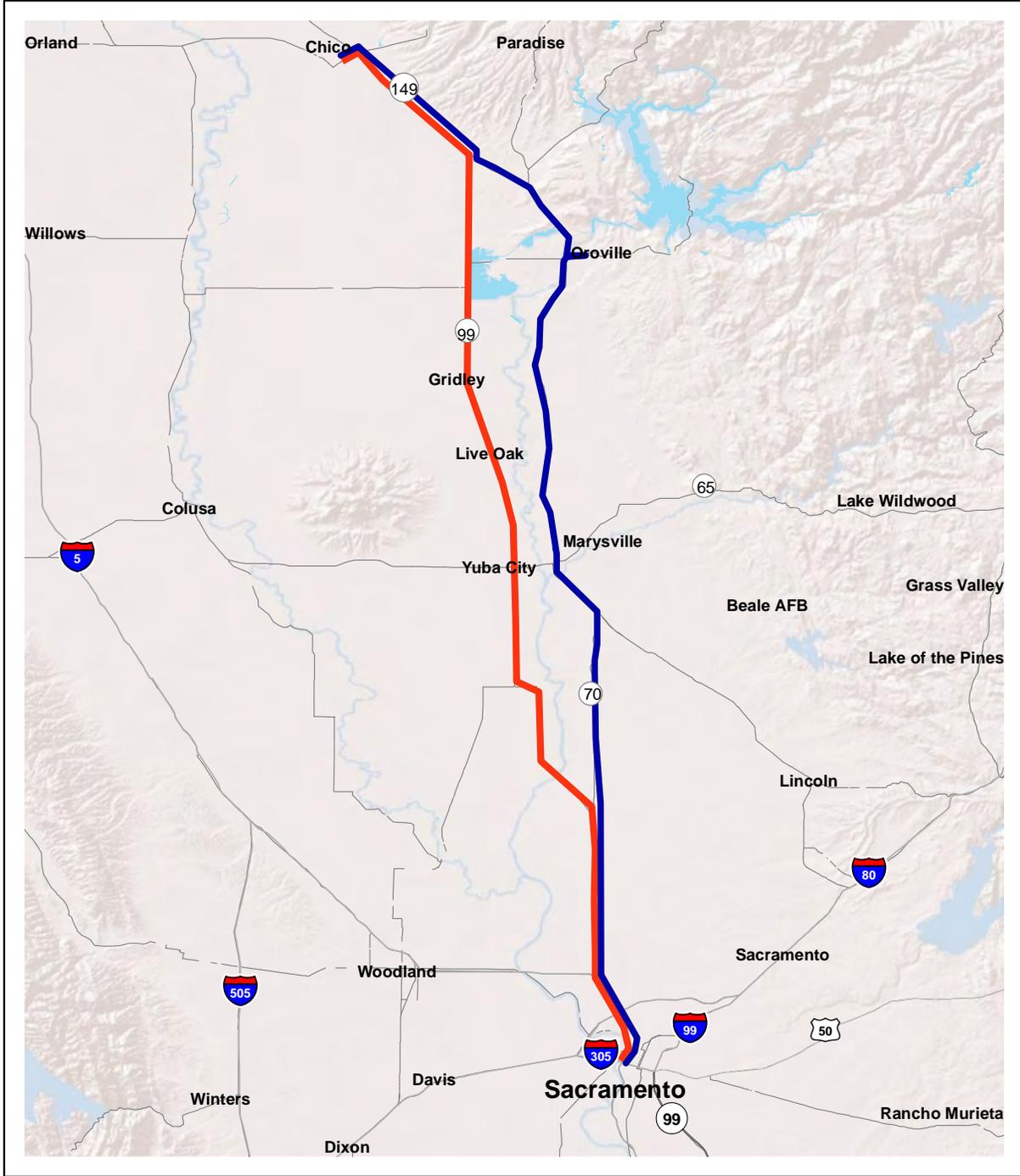
As also shown in Table 1, in total this service would require 12.10 in-service vehicle-hours per day, and travel 564 vehicle-miles per day. The second driver (not driving the off-direction run) would be paid for their travel time as well as the added wait time (over standard break time) in Sacramento. This totals 5.53 additional driver pay hours per day.

The 2012-13 B-Line operating cost equation presented in Technical Memorandum One was factored by an estimated 3 percent inflation rate to yield the cost factors for 2013-14. In addition, a factor for driver deadhead hours was identified based on driver wage rates and overhead costs. The resulting equation for 2013-14 operating costs is as follows:

$$\begin{aligned} \text{Marginal Operating Cost} = & \$51.83 \times \# \text{ of In-Service Vehicle-Hours} + \\ & \$17.55 \times \# \text{ Driver Deadhead Hours} + \\ & \$1.36 \times \text{In-Service Vehicle Miles} \end{aligned}$$

¹ This loop through downtown Sacramento is used by several of the existing commuter bus programs, as it has convenient access to/from I-5, and provides stops within convenient walk distance of all major downtown employment sites.

**FIGURE 1:
Potential Chico - Sacramento Commuter Transit Routes**



- Chico - Oroville - Marysville - Sacramento
- Chico - Gridley - Yuba City - Sacramento

Applying this equation to the daily service quantities, and assuming operation on 244 days per year (reflecting 10 holidays per year observed on work days), this alternative is estimated to incur an operating cost of \$379,000 annually, as shown in Table 2.

Ridership Estimate

Ridership that would be generated by this alternative is estimated by considering the total potential ridership presented in Technical Memorandum 1 (which reflects the quality of service provided at existing peer commuter transit systems serving downtown Sacramento, as well as Butte – Sacramento travel patterns) and applying a series of factors to reflect the quality of service that would be provided under this alternative compared to that of the peer systems. As shown in Table 3, these factors are on a scale from 0.00 to 1.00, where a value of 1.00 reflects no reduction in ridership². A series of three service quality factors were applied for this alternative:

- The most significant factor is the limited service schedule. While the peer systems provide a wide range of service time options, Butte commuters would be limited to the two AM and PM service times. A review of ridership by run for both the YST and the EDCTA systems indicates that the conceptual service times shown in the Butte service currently serve an average of approximately 39 percent of the total daily ridership (38 percent on YST and 39 percent on EDCTA). A corresponding factor is applied.
- Due to the early departure times from Chico and Oroville to meet the start of the work day in Sacramento, the morning commute runs would operate before the availability of local transit services. As few commuter passengers at peer systems access by public transit (the large majority drive to their transit stop), a 2 percent reduction is applied for this factor.
- The lack of a mid-day service also reduces the potential for ridership on the commute service. Based on the relative ridership on mid-day services on the peer systems, a factor of 0.88 is applied.

Daily ridership estimates are calculated by multiplying the potential demand by each of these three factors. The total potential demand reflects residents of those areas of Butte County within a reasonable drive distance of a potential stop. As shown in Table 3, this alternative is estimated to generate 77 one-way passenger-trips per day (or roughly 38 passengers making round-trips) for persons commuting to Sacramento. A similar analysis was conducted for Butte County residents commuting to Marysville/Yuba City. As the schedule would require a long work day (arrival no later than 6:55 AM, with a first departure at 5:00 PM), the “impact of limited schedule times” factor would be even lower than for Sacramento commuters. As a result, only 2 daily-round trips are forecast to be generated by Marysville/Yuba City commuters.

² As an example, a factor of 0.80 indicates that 20 percent of potential ridership would be dissuaded from using the service due to the specific service quality factor.)

TABLE 2: Butte County -- Sacramento Commuter Transit Service Alternatives

	Daily Service Quantities				Annual Service Quantities				Daily Ridership (1-Way Passenger-Trips) (2)			Annual Ridership (1-Way Passenger-Trips) (2)			Annual Operating Subsidy	
	In-Service Vehicle-Hours	Driver Deadhead Hours	In-Service Vehicle-Miles	In-Service Driver Hours	Vehicle-Headhead Hours	In-Service Vehicle-Miles	In-Service Driver Hours	Annual Operating Cost (1)	Sacramento	Marysville/Yuba City	Total	Sacramento	Marysville/Yuba City	Total		Facebook Revenue (2)
Individual Service Elements																
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs	12.10	5.53	564	3,073	1,405	143,256	\$379,000	77	2	79	19,600	500	20,100	\$149,000	\$230,000	
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs	11.50	5.33	540	2,921	1,355	137,160	\$362,000	76	3	79	19,300	800	20,100	\$148,000	\$214,000	
Add Mid-day round-trip Chico-Oroville – Marysville to connect with YST service	2.37	0.00	104	601	0	26,416	\$67,000	22	2	24	5,600	500	6,100	\$23,000	\$44,000	
Add Mid-day round-trip Chico-Gridley-Marysville to connect with YST service	2.33	0.00	98	593	0	24,892	\$65,000	19	4	23	4,900	1,000	5,900	\$22,000	\$43,000	
Extend One Mid-Day B-Line Route 20 Run from Oroville to Marysville to connect with YST service	1.23	0.00	64	313	0	16,256	\$38,000	22	2	24	5,600	500	6,100	\$23,000	\$15,000	
Overall Service Scenarios																
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	13.33	5.53	628	3,386	1,405	159,512	\$417,000	99	4	103	25,200	1,000	26,200	\$172,000	\$245,000	
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	12.73	5.33	604	3,234	1,355	153,416	\$400,000	98	5	103	24,900	1,300	26,200	\$171,000	\$229,000	

Note 1: Applying forecasted FY 2013-14 cost factors. Note 2: Reflecting full potential ridership, not typically achieved until the third year of a new transit service.

While the schedule for this alternative would provide the opportunity for residents of Sacramento, Marysville and Yuba City to travel north to Oroville or Chico on a daily basis, the fact that the schedule does not allow arrival in Chico until 10:06 AM and requires departure at 1:49 PM means that it would not be useful for most potential trips (such as commuting). This potential ridership is assumed to be negligible.

TABLE 3: Ridership Demand for Commute Period Alternatives

	Total Potential Daily 1-Way Psgr Trips	Service Quality Factors			Estimated Actual Daily 1- Way Psgr-Trips
		Impact of Limited Schedule Times	Impact of Lack of Local Transit Connections	Impact of Lack of Midday Service	
To/From Sacramento					
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs	228	0.39	0.98	0.88	77
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs	225	0.39	0.98	0.88	76
To/From Marysville/Yuba City					
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs	13	0.15	0.98	0.88	2
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs	26	0.15	0.98	0.88	3

Multiplying by the days of service per year, this alternative would carry an estimated 20,100 one-way passenger-trips per year, consisting of 19,600 generated by commuting to Sacramento and 500 generated by commuting to Yuba City/Marysville. It should be noted that these figures include travel for all purposes, not just commuting. As they are based on total observed ridership on the peer systems (not just commuters), they reflect all travel, including access to intercity transportation services, to the degree that these trips occur on the peer systems.

These figures reflect full potential ridership, once the service is well-established. Typically, new transit services do not achieve full ridership until the third year of operation, as it takes several years for potential passengers to become fully aware of the service, and to make changes in their daily habits needed to use transit service. While the proportion of full ridership that would occur in the first few years of service depends on marketing efforts, ridership is typically 60 percent of ultimate ridership in the first year of service, and 90 percent in the second year.

Fare Revenue

Identifying the appropriate fare level for a potential commuter service should consider several factors:

- Fares charged by existing public transit Sacramento commuter services. As shown in Table 4, base fares range from \$4 to \$7 per one-way trip. As the large majority of riders on these systems use monthly passes, the more important fare is that charged for the monthly pass, which ranges from \$128 to 178.50. Considered on a per-mile basis, the base fare results in a cost per mile ranging from \$0.10 to \$0.17 with an average of \$0.13. A monthly passholder commuting 20 days per month pays a total cost (including any employer subsidy) ranging from \$0.07 to \$0.14, with an average of \$0.10.

TABLE 4: Peer Sacramento Commuter Fares

	Yuba Sutter Transit	El Dorado County Transit	Solano Express	Amador Transit	Placer County Transit	San Joaquin RTD	Average
Base Fare (1-way trip)	\$4.00	\$5.00	\$5.75	\$5.50	\$5.75	\$7.00	\$5.50
Monthly Pass	\$128.00	\$180.00	\$130.00	--	\$178.50	\$160.00	\$155.30
Typical 1-Way Trip Length (Miles)	42	30	43	46	49	46	
Base Fare per Mile	\$0.10	\$0.17	\$0.13	\$0.12	\$0.12	\$0.15	\$0.13
Cost per Mile for Monthly Passholder Commuting 20 Days/Month	\$0.08	\$0.15	\$0.08	--	\$0.09	\$0.09	\$0.10

- With a relatively high route length (and thus cost), a higher fare for service from Butte County would be appropriate. Applying the average peer fare per mile to the 94-mile route length from Chico to Sacramento would indicate a base fare of \$12.30 and a monthly pass cost of \$360.
- The large majority of Sacramento County transit commuters have the cost of their fare (typically monthly pass) subsidized by their employer. Both the State of California and Sacramento County reimburse employees up to \$65 for the cost of their monthly pass.³ This means that most passengers are effectively indifferent to fares up to this level. Evidence of ridership reductions that accompanied EDCTA's fare increase to \$180 indicates that riders are sensitive to fare increases over this point.
- The cost of driving a private vehicle is currently estimated by the Internal Revenue Service to be \$0.24 solely for variable costs (fuel, tires) or \$0.565 if all costs (including depreciation and maintenance) are considered. A commuter driving a solo one-way trip from Chico to Sacramento thus incurs a variable cost of \$22.56, and a total long-term cost of \$53.11. The variable cost of a one-way trip by each member of a two-person carpool is \$11.28, while the total long-term cost is \$26.55.

Overall, a reasonable fare level for a new service would be as follows:

- One-way trip between Butte County and Sacramento – \$10
- Monthly pass between Butte County and Sacramento – \$300
- One-way trip between Butte County and Yuba City/Marysville – \$5
- Monthly pass between Butte County and Yuba City/Marysville – \$150

³ A 2011 survey of El Dorado Transit passengers commuting to Sacramento indicated that employers subsidized transit costs for 89 percent of riders.

At these rates, an existing member of a two-person carpool traveling between Chico and Sacramento purchasing a monthly pass and using it for 20 round-trips per month would save approximately \$150 a month compared with the variable cost of driving, and \$760 compared with the total cost of driving. A commuter currently driving solo would save \$600 per month in variable costs, or an impressive \$2,150 per month in total costs.

Another factor in assessing fare revenue is that many passengers on existing Sacramento commuter services purchase monthly passes, but use them only infrequently (due no doubt to the fact that their employer subsidizes the cost of the pass). This results in relatively high fare revenues per passenger-trip served. As an example, the YST Sacramento Commuter service generates \$4.37 in passenger revenues (largely monthly pass sales) even though the average fare if all passes were used 22 days per year would equal \$3.20. However, given that employees would be shouldering a much higher proportion of total pass costs for a Butte – Sacramento service, no additional fare revenue reflecting low use of passes is assumed.

Applying the recommended fares identified above, and conservatively assuming 100 percent monthly pass ridership, the average fare per one-way passenger trip would be \$8.25 for passengers traveling to/from Sacramento, and \$4.12 for passengers traveling to/from Marysville/Yuba City. The resulting estimated annual fare revenue totals \$149,000 per year, as shown in Table 2.

Subtracting the fare revenues from the operating costs, this alternative would require an estimated operating subsidy of \$230,000 per year. Applying a factor reflecting that Year One ridership would be 60 percent of ultimate ridership, this figure is estimated to be \$289,600 for the first year of service.

Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs

This alternative is identical to the previous alternative, except that the route operates along the SR 99 corridor through Durham, Gridley and Yuba City, rather than the SR 70 corridor. An example schedule is shown in Table 5. Reflecting the additional delays along SR 99 through Yuba City (compared to delays along SR 70 through Marysville), the travel time would be slightly longer though the route would be slightly shorter. In addition to the stops listed, it would be beneficial to establish a park-and-ride in the southern portion of Chico. Also, a park-and-ride stop at the intersection of SR 99 and SR 142 (Oroville Dam Boulevard) could also serve persons driving from Oroville and Paradise. This is show graphically in Figure 1.

The annual operating cost of this service is estimated to be \$362,000, as shown in Table 2. This is \$17,000 less than the previous alternative, as the reductions in mileage-related costs slightly exceeds the increase in hourly-related costs.

As shown in Table 3, the potential ridership of this alternative is essentially identical to that of the previous alternative, at 20,100 passenger-trips per year. Ridership to Sacramento would be slightly lower, but ridership to Yuba City/Marysville would be slightly higher. As the very large proportion of passengers will be park-and-riding, and the benefits of avoiding an auto trip all the way into Sacramento are much greater than the modest incremental drive time to a park-and-ride lot on SR 99, there would be little difference in the propensity of Oroville and Paradise area residents to use either route. Also, while there is greater commuting from Butte County to

Yuba City (in comparison with Marysville), the poor service times for commuters to either location and the fact that employment sites are dispersed over a large area (necessitating use of local transit) means that ridership potential is very low.

Farebox revenue would equal approximately \$148,000, yielding an annual operating subsidy of \$214,000 per year. This is \$16,000 less than the previous alternative.

TABLE 5: Example Schedule of Chico - Gridley - Yuba City - Sacramento Service, 2 AM and 2 PM Runs			
Southbound			
Chico (Transit Center)	5:25 AM	5:55 AM	1:55 PM
Chico (Fir St. PnR)	5:31 AM	6:01 AM	2:01 PM
Gridley (Spruce&99)	5:58 AM	6:28 AM	2:28 PM
Yuba City (Walton Terminal)	6:22 AM	6:52 AM	2:52 PM
Sacramento (15th&K)	7:20 AM	7:50 AM	3:50 PM
Northbound			
Sacramento (15th&K)	8:05 AM	4:05 PM	4:35 PM
Yuba City (Walton Terminal)	9:03 AM	5:03 PM	5:33 PM
Gridley (Spruce&99)	9:27 AM	5:27 PM	5:57 PM
Chico (Fir St. PnR)	9:54 AM	5:54 PM	6:24 PM
Chico (Transit Center)	10:00 AM	6:00 PM	6:30 PM
Total Daily Service Quantities			
In-Service Vehicle-Hours	11.50		
Driver Deadhead Hours	5.33		
In-Service Vehicle-Miles	540		
Source: LSC Transportation Consultants, Inc.			

Operate One Commute Period Bus on the SR 70 Corridor and One on the SR 99 Corridor

A third commute period alternative was considered, in which one AM run and one PM run are operated along the SR 70 corridor, while the other one AM and one PM run are operated along the SR 99 corridor. An example schedule is shown in Table 6. This option would have a cost similar to that of those discussed above (\$378,000 per year). It would have the advantage of providing equity between the two corridors. However, a substantial disadvantage of this option is that passengers parking at an intermediate stop (such as at Robinsons Corner) would have no flexibility on their PM departure time, as only one of the PM routes would return them to their car. As a result, the utility of the service to commuters living outside of Chico would be substantially reduced. There would also be operational problems associated with passengers mistakenly boarding a run that does not take them back to their car (which has long been a problem on the Yuba Sutter Transit services). For these reasons, this option is not considered further.

TABLE 6: Example Schedule With One Trip on Both Routes

Southbound			
Chico (Transit Center)	5:19 AM	5:45 AM	1:49 PM
Gridley (Spruce&99)	--	6:28 AM	--
Yuba City (Walton Terminal)	--	6:52 AM	--
Chico (Fir St. PnR)	5:25 AM	--	1:55 PM
Oroville (Transit Center)	5:53 AM	--	2:23 PM
Marysville (Caltrans)	6:25 AM	--	2:55 PM
Sacramento (15th&K)	7:20 AM	7:50 AM	3:50 PM
Northbound			
Sacramento (15th&K)	8:05 AM	4:05 PM	4:35 PM
Marysville (Caltrans)	9:00 AM	5:00 PM	--
Oroville (Transit Center)	9:32 AM	5:32 PM	--
Chico (Fir St. PnR)	10:00 AM	6:00 PM	--
Yuba City (Walton Terminal)	--	--	5:33 PM
Gridley (Spruce&99)	--	--	5:57 PM
Chico (Transit Center)	10:06 AM	6:06 PM	6:40 PM
Total Daily Service Quantities			
In-Service Vehicle-Hours	12.23		
Driver Deadhead Hours	5.53		
In-Service Vehicle-Miles	556		
Source: LSC Transportation Consultants, Inc.			

Operate Commute Service to Marysville/Yuba City Only, Relying on Yuba Sutter Transit For Connections to Sacramento

Rather than add new service to Sacramento, another potential strategy would be to initiate service only as far as Yuba City or Marysville, where Butte commuters would transfer to Yuba Sutter Transit services. This would have the benefit of significantly reducing the operating costs to B-Line (by roughly half that of the other commute period alternatives. However, there would be two significant disadvantages:

- It would require a transfer between the two transit services. Transit passengers find that the need to transfer significantly degrades the overall attractiveness of a transit trip, particularly in that it introduces uncertainty and the possibility of being stranded by a missed connection. This is particularly true of "discretionary" riders (such as commuters with ready access to a car). Ridership would be reduced on the order of 20 percent.
- More importantly, existing Yuba Sutter Transit runs do not have available excess seating capacity to accommodate additional riders generated by a Butte service. Based on the

ridership estimates, up to approximately 25 passengers would need to be accommodated. A review of the existing YST ridership and capacity per run (as shown in Technical Memorandum One) indicates that none of the existing AM runs have this capacity, and the only PM runs with adequate capacity are either early (such as the 3:30 PM departure) or late (departures after 5:10 PM). Moreover, the YST General Manager indicates that ridership tends to decline when the passengers per run exceeds roughly 75 percent of capacity (as passengers are less certain to get a seat, and less able to “spread out”). Given this, YST would need to operate additional buses to accommodate Butte County commuters.

As there is little opportunity for cost savings, as this strategy would require detailed agreements for cost and revenue sharing between YSTA and B-Line, and as ride quality (and thus ridership) would be degraded, this option is not considered further.

Add One Mid-day Round-Trip Between Chico-Oroville-Marysville to Connect with YST service

Ridership data from the peer Sacramento commuter systems indicates that providing mid-day service benefits overall service quality and ridership in several ways:

- It allows opportunities for commuters to work half-day.
- It provides “emergency ride home” opportunities to persons who otherwise would be concerned that a mid-day need to deal with an emergency (such as a sick child) leaves them stranded at work.
- It substantially improves the potential for non-commuters (such as intercity travelers) to use the transit service.

Under this alternative, B-Line would operate a single mid-day trip between Chico and Marysville via Oroville. A review of Yuba Sutter Transit schedules indicates that the most effective schedule would be to arrive in Marysville in time to transfer to the 1:00 PM southbound YST departure (from the Yuba County Public Works complex in Marysville) to Sacramento, and then wait for the 1:15 PM arrival at this same location from Sacramento. An example schedule is shown in Table 7. In combination with the commuter runs, this schedule would allow a morning stay in Sacramento from 7:20 AM to 12:07 PM, or an afternoon stay in Sacramento from 2:07 PM to 4:35 PM.

This service would increase ridership, both on the new runs as well as on the commute-period runs. An analysis of ridership by run on the peer systems, factored by the relative total demand and the various service quality factors, results in the ridership estimates shown in Table 8. As shown, a total of 24 additional daily one-way passenger trips would be added to the commute-only ridership by this alternative. This corresponds to approximately 6,100 passenger-trips per year.

Considering that some of this ridership represents incremental ridership on the commuter runs, that some of the ridership would be to/from Marysville, and that the remaining ridership would be distributed in both directions, the typical ridership added to the YST service would be

TABLE 7: Example Schedule of Midday Chico - Oroville - Marysville Connection to YST Sacramento Service

Southbound	
Chico (Transit Center)	11:49 AM
Chico (Fir St. PnR)	11:55 AM
Oroville (Transit Center)	12:23 PM
Robinson's Corner (SR 70/E. Gridley Road)	
Marysville (Yuba County Govt. Center)	12:55 PM
YST Departure to Sacramento	1:00 PM
Sacramento (15th&K)	2:07 PM
Northbound	
Sacramento (15th&K)	12:07 PM
YST Arrival in Marysville (Yuba County Govt. Center)	1:15 PM
B-Line Departure From Marysville	1:20 PM
Oroville (Transit Center)	1:52 PM
Chico (Fir St. PnR)	2:20 PM
Chico (Transit Center)	2:26 PM
Total Daily Service Quantities	
In-Service Vehicle-Hours	2.37
Driver Deadhead Hours	0.00
In-Service Vehicle-Miles	104

Source: LSC Transportation Consultants, Inc.

TABLE 8: Ridership Demand for Midday Period Alternatives

	Total Potential 1-Way Psgr Trips	Impact of Limited Schedule Times	Impact of Lack of Local Transit Connections	Impact of Transfer	Estimated Actual 1-Way Psgr-Trips
To/From Sacramento					
Add Mid-day round-trip Chico-Oroville – Marysville to connect with YST service	55	0.60	0.90	0.75	22
Add Mid-day round-trip Chico-Gridley-Marysville to connect with YST service	54	0.60	0.80	0.75	19
To/From Marysville/Yuba City					
Add Mid-day round-trip Chico-Oroville – Marysville to connect with YST service	3	0.75	0.90	1.00	2
Add Mid-day round-trip Chico-Gridley-Marysville to connect with YST service	6	0.75	0.80	1.00	4

approximately 8 passengers. As shown in Technical Memorandum One, these YST runs are operated using 41 passenger buses, with average passenger boardings per run of 23 to 24. There would therefore be adequate capacity on existing YST runs to accommodate this additional ridership. Provision of this mid-day service would therefore increase farebox revenues on YST, without triggering the need for additional service and associated costs.

The additional ridership would generate an estimated \$23,000 per year in increased farebox revenues to B-Line (as well as additional fares on YST). Subtracting these revenues from the operating costs, providing mid-day service under this alternative would increase operating subsidy needs by \$44,000 per year.

Add Mid-Day Round-Trip Chico-Gridley-Marysville To Connect With YST Service

This option is identical to that previously discussed, except that service would be provided along the SR 99 corridor rather than the SR 70 corridor. As the YST mid-day runs do not serve a consistent location within Yuba City, the B-Line service would still terminate at the Yuba County Public Works complex in Marysville, along SR 20 just east of the Sacramento River. An example schedule is shown in Table 9.

TABLE 9: Example Schedule of Midday Chico - Gridley - Marysville Connection to YST Sacramento Service	
Southbound	
Chico (Transit Center)	11:50 AM
Chico (Fir St. PnR)	11:56 AM
Gridley (Spruce&99)	12:23 PM
Marysville (Yuba County Govt. Center)	12:55 PM
<i>YST Departure to Sacramento</i>	<i>1:00 PM</i>
<i>Sacramento (15th&K)</i>	<i>2:07 PM</i>
Northbound	
<i>Sacramento (15th&K)</i>	<i>12:07 PM</i>
<i>YST Arrival in Marysville</i>	<i>1:15 PM</i>
B-Line Departure From Marysville	1:20 PM
Gridley (Spruce&99)	1:52 PM
Chico (Fir St. PnR)	2:19 PM
Chico (Transit Center)	2:25 PM
Total Daily Service Quantities	
In-Service Vehicle-Hours	2.33
Driver Deadhead Hours	0.00
In-Service Vehicle-Miles	98
Source: LSC Transportation Consultants, Inc.	

This alternative would be approximately \$2,000 less per year to operate than the previous alternative (a total of \$65,000). Ridership would be slightly (200 passenger-trips per year) lower, reflecting the greater population along the SR 70 corridor as well as the greater local transit service in Oroville. Subtracting the \$22,000 in estimated farebox revenues, this option would require on the order of \$43,000 per year in operating subsidy (\$3,000 more than the previous alternative).

Extend One Mid-Day B-Line Route 20 Run from Oroville to Marysville

Rather than operating a new mid-day run from Chico to Marysville, another less-costly option would be to operate a single daily run between Oroville and Marysville, as an extension of Route 20. This would work well in the northbound direction, as the 1:20 PM departure from Marysville would roughly coincide with the existing 1:50 PM Route 20 departure from Oroville. In the southbound direction, the 12:23 PM departure from Oroville for a 12:55 arrival in Marysville does not correspond well with existing Route 20 southbound arrivals into Oroville (at 11:38 AM and 1:38 PM). To avoid a long wait and transfer in Oroville (which would significantly impact the convenience of this service, particularly in light of the need to also transfer in Marysville), either an existing Route 20 run would need to be modified, or an additional southbound run added. Assuming existing service is modified, only the costs of the incremental service between Oroville and Marysville would be incurred. As shown in Table 2, this is estimated to equal approximately \$38,000 per year. As this is significantly more cost-effective than duplicating service between Chico and Oroville, this option for mid-day service is assumed for the remainder of this analysis.

SERVICE ALTERNATIVE PERFORMANCE ANALYSIS

Table 10 presents an analysis of the various alternatives, for three key transit performance measures:

- **Passenger-trips per vehicle service-hour** is a key measure of service effectiveness. As indicated, the commute period alternative would carry 6.5 to 6.9 passenger-trips per vehicle service-hour. This figure is highest for the mid-day service extension of Route 20 to Marysville, at a net increase of 19.5 passenger-trips per additional hour operated.
- The **operating subsidy per passenger-trip** measures the cost efficiency of public transit funding. The commuter services would require \$10.65 to \$11.44 per passenger-trip. The mid-day services would be substantially more effective, as low as \$2.46 per passenger-trip for Route 20 extension to Marysville.
- The **farebox return ratio** is the ration of passenger fares (including monthly pass sales revenue) divided by the operating cost. It is the key measure required by the Transportation Development Act. This measure is calculated to be 39 to 41 percent for the commute-only alternatives, up to 61 percent for the incremental extension of Route 20 to Marysville. Note that these figures consider marginal operating costs only, and do not include any allocated fixed costs in the denominator.

TABLE 10: Service Alternatives Performance Measures

	Passenger-Trips per Vehicle Service Hour	Operating Subsidy per Passenger-Trip	Farebox Return Ratio
Individual Service Elements			
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs	6.5	\$11.44	39%
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs	6.9	\$10.65	41%
Add Mid-day round-trip Chico-Oroville – Marysville to connect with YST service	10.1	\$7.21	34%
Add Mid-day round-trip Chico-Gridley-Marysville to connect with YST service	9.9	\$7.29	34%
Extend One Mid-Day B-Line Route 20 Run from Oroville to Marysville to Connect with YST Service	19.5	\$2.46	61%
Overall Service Packages			
Chico – Oroville – Marysville – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	7.7	\$9.35	41%
Chico – Gridley – Yuba City – Sacramento Service: 2 AM and 2 PM runs With Mid-Day Route 20 Service to Marysville	8.1	\$8.74	43%

In sum, the commute service along the SR 70 corridor through Marysville has slightly better or equivalent performance under all three measures compared with the SR 99 corridor option. Of the three mid-day alternatives, the extension of Route 20 to Marysville has substantially better performance under all three measures.

SERVICE SCENARIOS

Based on the results of the performance analysis, the preferable individual alternatives were combined to generate the following two scenarios.

Chico – Oroville – Marysville – Sacramento Commute Service with Route 20 Mid-day Extension to Marysville

Under this scenario, two runs would be operated in the AM period and two runs in the PM period along the SR 70 corridor between Chico and Sacramento via Marysville, and one mid-day run of existing Route 20 service between Chico and Oroville would be extended to Marysville to provide direct connections with YST service to Sacramento. Key characteristics of this alternative, as shown in the bottom portions of Tables 2 and 10, are as follows:

- Annual Operating Cost -- \$417,000
- Daily One-Way Passenger-Trips – 103
- Annual One-Way Passenger-Trips – 26,200
- Annual Farebox Revenues -- \$172,000
- Annual Operating Subsidy -- \$245,000
- Passenger-Trips per Vehicle-Hour of Service – 7.7
- Operating Subsidy per Passenger-Trip -- \$9.35
- Marginal Farebox Return Ratio – 41 percent

Chico – Gridley – Yuba City – Sacramento Commute Service with Route 20 Mid-day Extension to Marysville

This scenario would consist of two runs operated in the AM commute period and two runs in the PM commute period along the SR 70 corridor between Chico and Sacramento via Marysville, and one mid-day run of existing Route 20 service between Chico and Oroville would be extended to Marysville to provide direct connections with YST service to Sacramento. Key characteristics of this alternative, as shown in the bottom portions of Tables 2 and 10, are as follows:

- Annual Operating Cost -- \$400,000
- Daily One-Way Passenger-Trips – 103
- Annual One-Way Passenger-Trips – 26,200
- Annual Farebox Revenues -- \$171,000
- Annual Operating Subsidy -- \$229,000
- Passenger-Trips per Vehicle-Hour of Service – 8.1
- Operating Subsidy per Passenger-Trip -- \$8.74
- Marginal Farebox Return Ratio – 43 percent

This chapter provides options and strategies to address the various capital needs associated with a commuter transit program, including the transit vehicle fleet and bus stop improvements.

CAPITAL ALTERNATIVES

Bus Fleet Expansion

The vehicle requirements for commuter services are very different than the standard vehicles used for local services. As the travel length is significantly longer with commuter routes, providing increased comfort and amenities is key in encouraging people to choose transit over personal vehicles. On commuter buses, or “over-the-road coaches”, these amenities typically include:

- Forward facing seats with higher seat backs and armrests
- Lighting at each seat
- Climate control at each seat
- Wi Fi
- Luggage racks

Depending on the make and model of vehicle purchased, other common amenities include reclining seats, footrests and audio/video components.

In order for BCAG to obtain 5311(f) funding for the fleet, each vehicle must qualify as an over-the-road coach and include luggage storage areas. Over-the-road coaches are typically classified as buses with elevated passenger decks over a luggage storage area, however some models have luggage storage inside the vehicle. These types of vehicles range from 35' to 60', and are available in a wide range of fuel options, including hybrid, CNG and diesel. These fuel types would allow the new vehicles to be consistent with the current BCAG fleet and air quality goals in place.

For the service plans discussed in Chapter 2, BCAG would need to purchase a minimum of 2 vehicles for operations and one additional vehicle for back up, for a total of 3 vehicles. Based on the ridership estimates presented in Chapter 2, 35-foot to 40-foot passenger vehicles would accommodate the number of passengers on each route, as well as allowing for additional space. Having extra seating capacity available is an important consideration, for several reasons:

- Most importantly, excess seating capacity provides passengers with surety that a seat will always be available, and that they will not be “stranded” due to lack of available seating.
- Additional seating provides capacity for any unusual peaks in demand (such as at the beginning or end of college semesters).

- When not needed for other passengers, additional capacity allows passengers a more comfortable ride, thereby encouraging additional ridership.

The cost of these vehicles depends on the type of fuel, and generally range between \$350,000 for diesel to upwards of \$500,000 for hybrid electric. CNG models tend to fall in the middle, at roughly \$400,000 per unit.

Park and Ride Facilities

Another key component of the success of a commuter service is adequate areas for passengers board the bus. As departures for the Sacramento service would occur prior to the daily start of the current B-Line fixed route system, using transit to get to the commuter service is not possible. As a result, and consistent with ridership patterns at similar existing commuter transit services, the large majority of riders will arrive at the transit stop by auto. Park and Ride lots are common boarding areas that are used for commuter services, as they provide enough parking and are typically found on major roadway areas that are easily accessible by both passengers and the bus.

The service alternatives in Chapter 2 would utilize the existing lots in both potential service corridors, including the parking lot at the Chico Transit Center, the Chico Fir Street park and ride, the Oroville Transit Center and the Oroville park and ride. In addition to these facilities, at least one additional park and ride should be developed for either scenario. For the Chico – Oroville – Marysville – Sacramento service, a new lot in Gridley at Robinson's Corner (SR 70 and East Gridley Road) would provide parking and access for passengers from Gridley, Biggs and Palermo. For the Chico – Gridley – Yuba City – Sacramento service, a park and ride facility at Oroville Dam Road and SR 99 would provide parking and access for Oroville, Paradise and Thermalito passengers. In both locations, the vehicle would not have to travel off the main highway corridor, making these stops easily accessible without needing a lot of time.

Signage

The final capital element would be new signage at stop locations, as well as revised signage at existing stops, for the commuter route. New signs would need to be placed at the new park and ride locations, as well as in the downtown Sacramento area. BCAG will need to coordinate with Sacramento RT to get B-Line information on the signage in the downtown transit core area, as well as to get general approval to use the stops to ensure coordination with other services.

Downtown Area Daytime Bus Storage

The service alternatives presented in Chapter 2 would result in storage of one bus over the mid-day period in downtown Sacramento. At present, other commuter services have an arrangement with Sacramento RT to store buses beneath the Capital Center Freeway (near P Street and 29th Street). A similar agreement could probably be developed between B-Line and Sacramento RT.

Operate Commuter Bus as Short-Term Pilot Program and Contractor

One alternative to B-Line implementing in-house operation of a permanent commuter transit service would be to implement a pilot program. Pilot projects are common when starting new transit services, as it allows for both the transit agency and the public to gauge the effectiveness of a service without fully committing to a long-term project and funding at the start.

As part of this, the service could be operated through a contractor (such as through an amendment to the existing service contract), with the service contractor providing the necessary three-bus fleet. This would eliminate the need for BCAG to purchase vehicles for the service. Should the service prove successful and be approved for long term operation, the agency could include the service into a single service contract and/or obtain vehicles. There are two benefits to initially operating the service in this manner, from the agency's perspective: 1) a large funding commitment is not required up front for capital items, staff, etc., and 2) if the project is not successful or does not meet minimum performance standards, it can just be eliminated and the agency is not left with buses they can no longer use.

Cost Examples

One method for operating the service, as discussed above, is to have a contractor provide drivers plus vehicles for the commuter routes. Doing so would allow BCAG to have limited capital investment in a pilot project until it is determined whether the service is successful or not. Amador Stage Lines was contracted by the North Lake Tahoe Resort Association to provide skier shuttle services in Lake Tahoe, utilizing Amador Stage Line vehicles and drivers, and included fuel, maintenance and reporting. The costs incurred to the Resort Association were on a per vehicle per day basis; for a commuter service, it is estimated that the cost would be roughly \$900 per bus per day. Based on the number of days the commuter service would operate, these costs could total on the order of \$457,000 per year. Note that this is a rough estimate of costs, and the only way to confirm actual costs is to hold negotiations with potential contractors. This option would also not include the costs to operate the mid-day Route 20 extension of service to Marysville, which would add approximately \$38,000 in operating costs per year.

Placer County Transit (PCT) operates a commuter bus service into Sacramento using a contract service with Amador Stage Lines. Unlike the first example, this contract is only for the drivers; PCT supplies management, dispatch, vehicles and other supplies. The contract agreement is currently set at \$104.81 per vehicle revenue hour, plus \$53.27 per day for driver transport costs. The driver shift hours are 16 hours in the morning and 17 hours in the afternoon, however the actual revenue hours are only 6 hours each for the morning and afternoon shifts. As such, there is a significant amount of deadhead time, which contributes to the higher per revenue hour costs. It is important to note that the contract cost does include the storage of buses at Amador Stage Line's bus yard during the middle of the day, but does not include

maintenance. Given the potential revenue hours for operating the service from Butte County, and applying the PCT costs, the service would cost on the order of \$330,000 per year, depending on which alternative is chosen. This would not include the Route 20 connection scenarios to Marysville, which would be operated by B-Line and would subsequently increase overall costs by \$38,000. Further, vehicles would need to be purchased.

Summary

The pilot program option offers a number of advantages to Butte County, as discussed above. Similarly, both of the cost examples shown also have advantages. While operating the service wholly with a contract, meaning vehicles plus drivers, may cost more than what it would cost for BCAG, it eliminates the need to purchase vehicles up front. This, in turn, would reduce the long term commitment for BCAG. Having a contractor provide only the drivers could reduce operating costs, based on the PCT contract costs, and may be a more long term solution should the program prove successful, at which time vehicles could be purchased by BCAG.

Marketing for Commuter Services

Any new service needs to be marketed appropriately to ensure that the widest audience possible is aware of the service. In addition to standard methods, such as advertising in local media and on the agency's website, advertising can be done through coordination and partnerships with other agencies and businesses. In general, social media is important to commuters. Email updates directly from B-Line / BCAG would keep riders aware of the service, in addition to other social media channels like Facebook and Twitter.

Advertising the commuter service through Sacramento employers, such as the State government, would likely reach a large majority of potential passengers. The marketing would include information regarding the subsidy currently provided by the State for transit passes. At the moment, this is roughly 75 percent of the cost for a monthly pass, up to a maximum of \$65 per month.

Information for the commuter route should be marketed through the CSU Chico offices, as it is assumed that not only employees would use the service, but also students who may want to get to Sacramento for other purposes, such as Amtrak service. Both printed media (newspapers, flyers, etc) and the website would be good places for advertisements.

Coordination with nearby Transportation Management Associations (TMAs) is critical. These associations manage transportation efforts in a regional context, and including information about multiple transit agencies and their services. Presently, Butte County does not have a TMA, however the nearby Yuba / Sutter TMA and the Sacramento TMA could be utilized as a means to disseminate information. These website could include initial advertisements regarding the start of the service, as well as ongoing email blasts and general links to the Butte County commuter service schedules / maps.

Coordination of Services with Yuba/Sutter Transit

All of the potential service alternatives, as well as the service scenarios with the Route 20 extension, would stop in either Marysville or Yuba City. As such, it would be beneficial for BCAG to coordinate and work together with Yuba / Sutter Transit to ensure both services work in concert with one another. Discussions between agencies would include agreements for use of bus stops, mutual assist (such as if vehicles break down in route and maintenance is required), maintenance emergencies and other similar scenarios.

Coordinate and Communicate with Sacramento RT

BCAG/B-Line would also need to coordinate with Sacramento RT, as the service would be entering their jurisdiction and using their system's stops. Coordination with Sacramento RT would include developing agreements that allow B-Line to operate services in the downtown area (similar agreements are in place with Yuba / Sutter Transit and El Dorado Transit), as well as an agreement for use of stops and coordination with the other services in the area, and optimally for mid-day storage.

Develop and Implement Performance Monitoring and Goals

As with any new service, it is important to have performance goals and measures in place so that the service can effectively be evaluated. The following goals, performance measures, and standards are designed to reflect the adopted policy statements of the region. Goals establish general direction for policies and operation and are value-driven providing long-range perspective. Standards are quantifiable observable measures that reflect achievement of the goals. The performance measures provide the mechanism for judging whether or not the standards have been met.

Three major goals are identified: a service efficiency goal (reflecting efficient use of financial resources), a service effectiveness goal (reflecting effectiveness in serving passengers), and a service quality goal. These measures can be used to determine whether the service is meeting minimum goals, something that is particularly important in the case of operating a pilot program.

Standards are provided as appropriate, based upon observed performance of similar commuter services in California.

Service Efficiency Goal

To maximize the level of services that can be provided within the financial resources associated with the provision of transit services. The standards should not be strictly applied to new routes for the first two years of service, so long as 60 percent of standard is achieved after one full year of service and a favorable trend is maintained.)

Farebox Recovery Ratio Standard – The ratio of farebox income to operating costs should meet or exceed 30 percent.

Subsidy Standard – The public operation/administrative subsidy per passenger-trip for service should not exceed \$15, and should be adjusted annually to account for inflation.

Service Effectiveness Goal

To maximize the ridership potential of B-Line's potential commuter service. (The standards should not be strictly applied to new routes for the first two years of service so long as 60 percent of standard is achieved after one year and a favorable trend is maintained.)

Service Effectiveness Standard – Serve a minimum of 6 passenger-trips per vehicle service hour.

Service Quality Goal

To provide safe, reliable, and convenient transit services.

Service Availability Standard – Provide transit service to employment centers that can support commuter service consistent with the service efficiency and effectiveness goals.

On-Time Performance Standard – 90 percent of all trips should be operated "on-time," defined as not early, and no more than 5 minutes late.

Missed Trips Standard – The proportion of runs not operated or more than 15 minutes late should be no more than 1 percent.

FINANCIAL SOURCES

Funding Source Overview

Transit funding is obtained from multiple sources, with the most prominent being from Federal and State grant and other programs. Transit funding (not including passenger revenues), particularly in California, can be complicated due to the many available sources. The following is a summary of the available funding sources, beyond the standard funding used for existing fixed route operations and capital needs, and includes discussion (where applicable) regarding the new changes resulting from Moving Ahead for Progress in the 21st Century (MAP-21). It should be emphasized that there is a high degree of uncertainty regarding many of the transit funding programs over the long-term, as these depend on future decisions regarding public funding priorities.

Federal Funding Sources

The Federal Transportation Administration has numerous grant programs available to transit agencies for both operating and capital assistance. Eligibility in many programs are dependent upon population, distinguishing between “urban” and “nonurbanized” areas for funding allocations. Those applicable to Butte County are FTA 5307, 5311(f), 5339 and Congestion Management / Air Quality (CMAQ), each of these is discussed in detail below.

FTA Section 5307 Urbanized Area Formula Grant

The largest of FTA's grant programs, this program provides grants to urbanized areas (50,000 population or more per the US Census) to support public transportation. Funding is distributed by formula based on the level of transit service provision, population, and other factors. The program remains largely unchanged with a few exceptions:

- *Job access and reverse commute activities now eligible:* Activities eligible under the former Job Access and Reverse Commute (JARC) program, which focused on providing services to low-income individuals to access jobs, are now eligible under the Urbanized Area Formula program. This includes operating assistance, with a 50 percent local match required for job access and reverse commute activities. In addition, the urbanized area formula for distributing funds now includes the number of low-income individuals as a factor. There is no floor or ceiling on the amount of funds that can be spent on job access and reverse commute activities.
- *Expanded eligibility for operating expenses for systems with 100 or fewer buses:* MAP-21 expands eligibility for using Urbanized Area Formula funds for operating expenses. Previously, only urbanized areas with populations below 200,000 were eligible to use Federal transit funding for operating expenses. Now, transit systems in urbanized areas over 200,000 can use their formula funding for operating expenses if they operate no more than 100 buses. Systems operating between 76 and 100 buses in fixed route service during peak

service hours may use up to 50 percent of their “attributable share” of funding for operating expenses. Systems operating 75 or fewer buses in fixed-route service during peak service hours may use up to 75 percent of their “attributable share” of funding for operating expenses. This expanded eligibility for operating assistance under the urbanized formula program excludes rail systems.

In Fiscal Year 2013, this program has a total of \$4.367 billion, while this increases to \$4.428 billion in Fiscal Year 2014.

FTA Section 5311(f) Intercity Bus Service Grant

FTA 5311 funds are typically allocated to rural areas (under 50,000 population) for operating expenses with fixed route service. However, 15 percent of these funds are allocated for Intercity Bus Programs under subsection (f). The program is specific to intercity bus transportation programs that link urbanized and non-urbanized area, contributing to greater regional and statewide connections. Criteria for intercity bus services includes:

- Regularly scheduled bus service, available to the general public, operating on fixed-routes to more distant points (greater than 50 miles from the point of origin);
- Making limited stops;
- Connecting two or more areas not in close proximity (greater than 15 miles apart);
- Capacity for transporting baggage (racks above seating or in exterior luggage areas); and
- Provide meaningful connections and reasonable layover times

Funding is available for operations and capital assistance, including bus purchase, bus-related equipment (AVL, ITS etc), transit infrastructure (bus shelters and benches, security features, etc) and planning / marketing studies. Per Caltrans, maximum award limits are as follows: \$300,000 for operations; \$300,000 for bus purchases; \$200,000 for bus related equipment; \$200,000 for transit infrastructure; and \$100,000 for planning / marketing studies. The maximum percent federal share for operations is 55.33 percent, while the remaining capital components have a maximum federal share of 88.53 percent.

In Fiscal Year 2013, the total funding available through Caltrans was \$3.6 million for the FTA 5311(f) program. The fact that Chico and Oroville are currently served by intercity bus service (Greyhound) as well as Amtrak Thruway service probably reduces the potential for this funding source to be available for a parallel commuter bus service.

FTA Section 5339 Bus and Bus Facilities Grant

Prior to MAP-21, this grant was part of the FTA 5309 program. The purpose of the bus and bus facilities grant is to provide capital funding (replacement, rehabilitation or purchase) of vehicles and vehicle-related facilities / equipment, and to construct new bus-related facilities.

Funding for Fiscal Year 2013 is estimated at \$422 million and at \$427 million in Fiscal Year 2014. As with other federal programs, the federal share is 80 percent and a local 20 percent match is required. The formula for which funding is allocated is based upon population, vehicle revenue miles and passenger miles. Upon apportionment, the funds are available for three years after the fiscal year.

Congestion Mitigation and Air Quality Improvement Program (CMAQ)

Another federal program under MAP-21 is the CMAQ program, which is designed to help areas meet the Clean Air Act requirements. The goal is to reduce congestion and improve air quality in nonattainment areas and maintenance areas. Eligible activities include:

- Traffic monitoring, management or control facilities if it contributes to attainment of an air quality standard;
- Projects that improve traffic flow, including HOV lanes, intersection improvements, and ITS;
- Purchase of emergency communications equipment;
- Projects that shift traffic demand to nonpeak hours or other transportation modes, increase vehicle occupancy rate or reduce demand;
- Purchase of diesel retrofits;
- Facilities serving electric or natural gas fueled vehicles; and
- Some expanded authority to use funds for transit operations

In Fiscal Year 2013, approximately \$2.21 billion for CMAQ funds, and \$2.23 billion in Fiscal Year 2014.