



Market Based Transit Study

Working Paper #4: B-Line Preferred Alternative

4/19/2010

**Butte County Association of
Governments**



TRANSIT RESOURCE CENTER

Introduction

Background

This is the fourth working paper for the BCAG Market-Based Transit Study. It provides the routing, scheduling framework, vehicle service hours, and hours of operation for the preferred alternative. Since ten months have elapsed from the first working paper to this working paper, the key findings of the first three working papers are presented to provide the context for the preferred alternative.

The first working paper, finalized in June 2009, reported on the results of the Community Telephone and E-Survey Reports. The market research report was based on the data collected from three surveys: a random community telephone survey of Butte County residents, a non-random e-survey of Butte County commuters (college students and employees) and a comprehensive survey of B-Line riders. The later survey of B-Line riders was completed in 2008 and was conducted under a separate contract. A few of the key findings are repeated below.

Butte County's population appears to be surprisingly open to the concept of using public transportation. Both the general population reflected in the phone survey, and the commuter population reflected in the e-survey, include large segments of potential riders.

Phone Survey

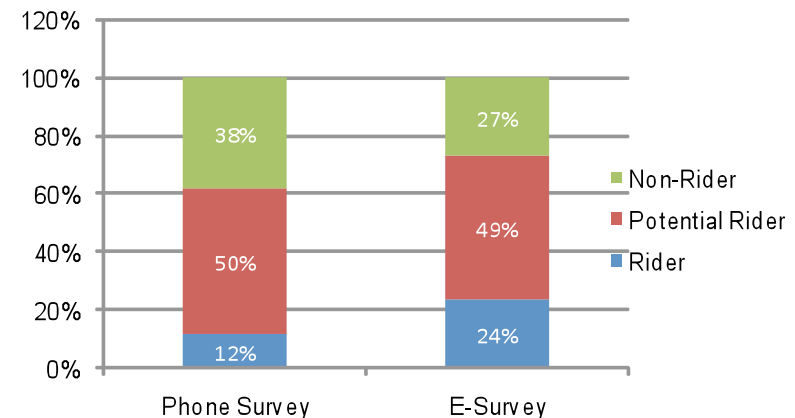
- Twelve percent of residents already use the bus, at least occasionally, and fully half of the population says they would be willing to consider riding if service were convenient.
- Among the potential riders, 63% say they believe using transit would be "convenient" and 87% say they can realistically see themselves using B-Line if service improvements were made.

E-Survey

- Of commuters who responded to the e-survey, 24% currently use B-Line at least once a month, while half (49%) are potential riders open to the idea of using B-Line regularly.
- Commuters captured in the e-survey were somewhat less optimistic about B-Line's convenience than potential riders in the general population. Thirty-nine percent (39%) of the potential riders thought B-Line would be convenient, and 66% thought they would realistically consider using B-Line if major improvements were made.

Even among residents who don't use B-Line regularly, many indicated a true willingness to give it a try.

Market Segments



The majority (about 80%) of both the Butte County population included in the phone survey and the respondents to the e-survey enjoys full modal choice. This means that if passengers are to be attracted to transit use it will be because of factors other than lack of a vehicle.

Despite the high level of modal choice, there is currently a significant minority of the population which uses alternative modes of transportation to commute to work or school.

】 Phone Survey

- Among the general population, only two-thirds (66%) drive alone to work or school. Twenty percent carpool, 5% bike, 4% ride the bus, and 4% walk.
- Among potential riders in the general population, 65% currently drive alone, while 25% carpool.

☰ E-Survey

- Among the e-survey respondents, 70% drive alone, while 11% bicycle, 8% carpool, 7% ride the bus and 4% walk.
- Student commuters are much more likely to ride the bus (23%), bike (19%) or walk (13%). Only 33% drive alone.
- Among the potential commute riders, 79% drive alone, while 9% bike and 9% carpool.

The second working paper, completed in July 2009, was the Existing Conditions Report. The purpose of this report is to provide an accurate baseline for the development of four alternatives for the Market Based Transit Study. The main feature of this report is individual route profiles of the Chico Urban Routes and Regional Routes 20, 40, and 41. A summary of existing performance is provided below.

Chico Urban Routes

The table at the right provides a summary of the average monthly performance from September 2007 to June 2008 when CSUC and other schools are in session. Route 6 has the highest average monthly ridership at 17,384 monthly passengers. Route 8, one of the CSUC student routes, has the highest productivity at 39.0 passengers per hour. Route 7 has the lowest ridership with just 1,696 monthly passengers and just 5.8 passengers per hour. The cost per passenger is just \$2.02 for Route 8, but is \$12.14 for Route 7.

Chico Routes	10- month Average FY 2007/08: 9/2007-6/2008				
	Monthly Rev. Hrs.	Monthly Costs	Monthly Passenger	Pass/ Rev. Hour	Cost/ Passenger
1	465	32,550	9,201	19.8	\$3.54
2	456	31,920	7,629	16.7	\$4.18
3	388	27,160	9,230	23.8	\$2.94
4	388	27,160	7,676	19.8	\$3.54
5	611	42,770	8,395	13.7	\$5.10
6	627	43,890	17,384	27.7	\$2.52
7	294	20,580	1,696	5.8	\$12.14
8	259	18,130	10,102	39.0	\$2.02
9	259	18,130	6,861	26.5	\$2.97
10	338	23,660	4,692	13.9	\$5.04

Oroville Routes

The table at the right shows the performance of the four local Oroville routes. There are significantly fewer monthly revenue hours in Oroville than in Chico, which reflect the lower demand levels. Average monthly passengers for this weekday-only service range from 351 to 790 monthly passengers. Productivity, as measured in passengers per vehicle revenue hour, is particularly low, ranging from 4.8 to 11.0 passengers per hour. Route 27 is higher than average because it does serve a number of students at Las Plumas High School before and after school.

Oroville Routes	10- month Average FY 2007/08: 9/2007-6/2008				
	Monthly Rev. Hours	Monthly Costs	Monthly Passengers	Pass/ Rev. Hour	Cost/ Passenger
24	74	\$5,145	351	4.8	\$5.85
25	114	\$7,980	790	6.9	\$6.37
26	49	\$3,430	396	8.1	\$6.79
27	57	\$3,990	628	11.0	\$7.20

Regional Routes

There are five regional routes that connect the towns and cities of Chico, Oroville, Paradise, Magalia, Gridley and Biggs. Service levels vary greatly. Route 20 offers hourly service on weekdays and service every two hours on weekends. Route 20 has high productivity for a longer intercity route, at 19.3 passengers per hour, with a cost per passenger of just \$3.63.

At the other end of the service level continuum is Route 31, with just one trip in the morning and one trip in the afternoon between Oroville and Paradise on weekdays only. The service averages 9 passengers per hour, which is lowest among the B-Line intercity routes, but still quite respectable compared to other peer intercity services. Routes 40 and 41 between Magalia, Paradise and Chico provide over 700 monthly revenue hours of service. Route 40 is slightly more productive with 13.9 passengers and a cost per trip of \$5.04, second to Route 20.

Regional Routes	10- month Average FY 2007/08: 9/2007-6/2008				
	Monthly Rev. Hours	Monthly Costs	Monthly Passengers	Pass/ Rev. Hour	Cost/ Passenger
20	518	\$36,260	9,999	19.3	\$3.63
30	131	\$9,170	1,311	10.0	\$7.00
31	39	\$2,730	353	9.0	\$7.74
40	427	\$29,890	5,930	13.9	\$5.04
41	289	\$20,230	2,954	10.2	\$6.85

A series of workshops was held between March 30 and April 2nd 2009 to receive public input on the B-Line system and opportunities for improvement in the future. Many of the public comments received were considered in the development of the alternatives presented in this working paper.

The final input to the development of the four alternatives was a Design Summit held with BCAG staff, Veolia staff, two elected officials representing the Project Development Team, and project consultant staff, from July 28th to July 30th. General sessions were held on each day:

- July 28th: Chico Routes
- July 29th: Regional Routes and Oroville Routes
- July 30th: Preliminary Proposals.

The primary purpose of the Design Summit was to utilize the results of the market research, public input, and evaluation of existing B-Line services to craft four alternatives to the B-Line route network and schedule. It was a collaborative process among the design summit team participants. The consulting team also conducted field investigations during the three-day Design Summit. This working paper builds on the Design Summit results.

The third working paper provided four specific alternatives to consider. B-Line provided 67,024 annual vehicle revenue hours as of November 2008, the baseline date used for the Market-Based Transit Study. The four alternatives include:

1. A 10% decrease in vehicle revenue hours.
2. Reallocation of existing vehicle revenue hours to better meet market needs.
3. 10% increase in vehicle revenue hours.
4. Market Based scenario that reasonably matches market needs with B-Line service levels without a financial constraint.

The four alternatives include individual specific actions that can be implemented separately if, for example, there is a need for a 5% reduction in service instead of a 10% reduction.

At a meeting of the Project Development Team it was determined that Alternative 2, with modifications should be the preferred alternative. This alternative reallocates how the existing 67,000 vehicle revenue hours are allocated. This working paper provides the specifics of the preferred alternative. However, before describing the preferred alternative, a description is provided of the current allocation of the 67,000 vehicle revenue hours and the existing service levels.

Breakdown of Existing Annual Vehicle Revenue Hours and Service Levels

Exhibit 1 is a breakdown of existing vehicle revenue hours by route and service type for both weekday and weekend service. There are a total of 67,024 vehicle revenue hours for the existing B-Line Service.

Exhibit 2 provides a summary of the existing service levels for B-Line by route and the days of the week. The span of service and frequencies by time of day are provided for each route in the B-Line system.

Exhibit 1, Existing Vehicle Revenue Hours

Chico Routes	Daily Weekday	Daily Saturday	Daily Sunday	Annual Total
1	19.83	10.00		5,578
2	19.43	10.00		5,476
3	16.23	9.83		4,651
4	16.23	9.95		4,657
5	26.70	10.00		7,329
6	27.48	10.00		7,528
7	11.83	9.83		3,529
8	11.50*			1,744
9	11.50*			1,744
10	13.90	9.90		4,059
Subtotal	174.7	96.5		46,294
Oroville Routes				
24/25/26/27	13.9			3,532
Regional Routes				
20	20.4	9.9	9.9	6,215
30	4.75	7.0		1,575
31	1.82			463
40	16.30	10.9	7.9	5,130
41	13.33	1.4		3,471
Subtotal	56.6	29.1		16,855
Paradise Routes				
46	1.4			344
Total	247.8	125.6	17.7	67,024

*Table 1 Note: A reduced service span on Fridays results in only 8.50 hours on Routes 8 and 9.

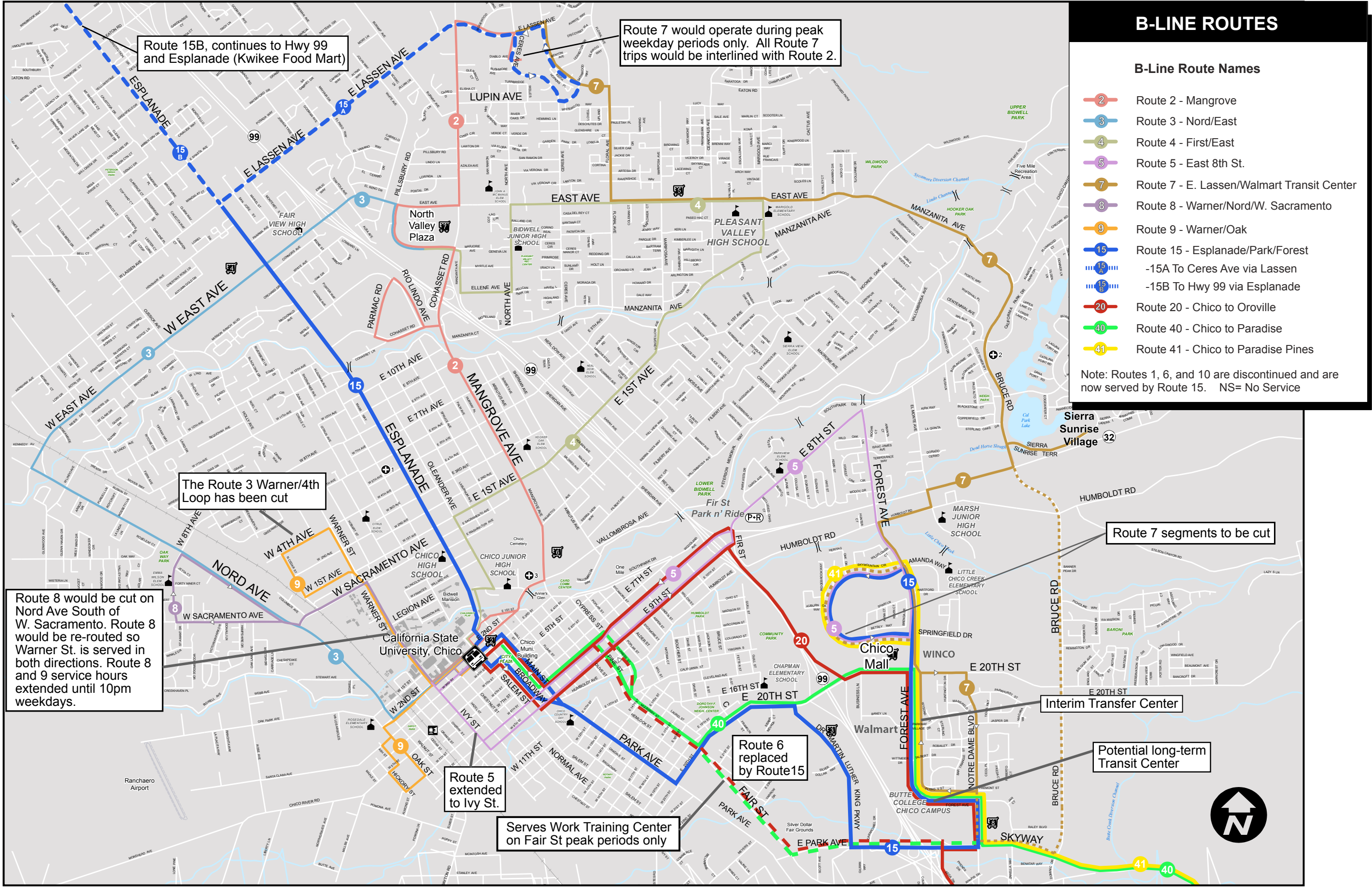
Exhibit 3, Proposed Chico B-Line Routes

B-LINE ROUTES

B-Line Route Names

- Route 2 - Mangrove
- Route 3 - Nord/East
- Route 4 - First/East
- Route 5 - East 8th St.
- Route 7 - E. Lassen/Walmart Transit Center
- Route 8 - Warner/Nord/W. Sacramento
- Route 9 - Warner/Oak
- Route 15 - Esplanade/Park/Forest
 - 15A To Ceres Ave via Lassen
 - 15B To Hwy 99 via Esplanade
- Route 20 - Chico to Oroville
- Route 40 - Chico to Paradise
- Route 41 - Chico to Paradise Pines

Note: Routes 1, 6, and 10 are discontinued and are now served by Route 15. NS= No Service



Significant analysis and discussion has taken place on the future of Route 7. As discussed in detail in the existing conditions report, Route 7 had just 5.8 passengers per hour with a cost of \$12.04 per passenger, well below the system average. The original consulting team recommendation was to eliminate Route 7. However, based on comments from the Project Development Team, alternatives were explored for providing a limited peak period service to serve local residents, commuters and students. The recommended routing shown in Exhibit 3 is to connect with Route 2 on the north with service to Pleasant Valley High School, Sierra Sunrise Village and the interim Walmart Transit Center on Forest Ave. Three trips in each direction would be provided during morning and evening peak periods.

Providing 15-minute service on Route 15 during peak periods would require the reduction of frequencies on Route 5 from every 30 minutes to every 60 minutes in order to stay within the 67,000 vehicle revenue hour limit. Next to Route 7, Route 5 has the lowest productivity of the Chico Routes with 13.7 passengers per hour. Route 6 also serves the Chico Mall and has a very high productivity of 27.7 passengers per hour with all-day 30-minute frequencies. While the existing frequency of 30 minutes is desirable, it is felt that the vehicle revenue hours devoted to Route 15 will improve overall system productivity.

The preferred alternative has a few route adjustments recommended for the Chico Routes:

- Route 8 would have two-way routing on Warner St. to better connect CSUC origins and destinations.
- Route 3 deviation via 4th and Cedar would be eliminated. In the evenings Monday through Thursday when CSUC is in session, Routes 8 and 9 would have 60-minute service to 10 pm.
- Route 2 would not be interlined with Route 1 as is currently the practice. A new terminal loop is recommended using Ceres Ave. Eaton Ave and E. Lassen Ave., serving Foothill Manor, Cobblecreek, Eastwood Court, and East of Eaton apartments. A timed transfer would be established with Route 7.
- Route 15 would have select peak period trips routed on Fair St. to serve the work training center.
- Route 5 would be extended to Ivy St. along the 8th and 9th couplet, to serve the area formerly served by Route 6.

Oroville Service

The existing Oroville routes are not working well. There are significantly fewer monthly revenue hours in Oroville than in Chico, which reflect the lower demand levels. On average, Routes 24, 26 and 27 have frequencies every 120 minutes and route 25 has a frequency of every 60 minutes. Service is operated only from Monday to Friday. Average monthly passengers for this weekday-only service range from 351 to 790 monthly passengers. Productivity, as measured in passengers per revenue hour, is particularly low, ranging from 4.8 to 11.0 passengers per hour, below the BCAG minimum standard of 12 passengers per vehicle revenue hour for rural routes. Route 27 is higher than average because it does serve a number of students at Las Plumas High School before and after school.

At the July 2009 Design Summit and during consultant team field visits, a transition away from fixed-route service to zonal general public dial-a-ride service was discussed and this option was presented at the last Project Development Team meeting. Further discussion and analysis with BCAG staff led to the following conclusions: 1) fare revenues would be significantly reduced in the zonal dial-a-ride option 2) there are no additional funding sources available. With the potential of reallocating service hours from ADA Paratransit to fixed route service, the potential for keeping fixed route service in Oroville with improved service levels was explored.

Exhibit 2 provides the recommendations for a four-route, two-bus operation in Oroville. Service would be provided on hourly frequencies, a major improvement over existing service levels. Route A is the old Route 25, with some service enhancements suggested by Oroville's lead driver. Route A turns into Route C. Route C routing would be through the south Oroville neighborhood, Gold Country Casino, Kelly Ridge, Oroville Hospital, returning to the Oroville Transit Center. Extension to Kelly Ridge is based on input during the Human Services-Public Transit Coordination Plan process, the Market-Based Transit Demand workshop held in Oroville, and the unmet needs hearing process.

Route B would serve the Thermalito area and the County Center area on a one-way loop, with direct service between the County Center and the Oroville Transit Center in the clockwise direction. This route covers most of the existing Route 24. The difference is that Route B will operate on hourly frequencies, will operate on the one-way loop, and will provide a direct connection between the County Center and Oroville Transit Center. Connections to Route 20 would be Public Works in the County Center Area.

One bus would operate both Routes B and D. Route D would operate between the Oroville Transit Center and Las Plumas High School providing service on the Lincoln Blvd corridor on hourly frequencies.

Convenient connections on all 4 routes would be provided to Route 20 and this is further discussed later under the "Schedule Framework" of this working paper

Paradise/Magalia Service

The primary service in Paradise and Magalia is provided by Routes 40 and 41. As described further below, the service levels on Routes 40 and 41 would remain the same in the preferred alternative. Route 41 would terminate at the Walmart Transfer Point, with transfers available on Route 15 to downtown Chico. Under this preferred alternative, it is recommended that Route 46 be eliminated in Paradise. Route 46 has the lowest productivity of all routes in the B-Line system with 2.7 passengers per vehicle revenue hour and cost of \$25.18 per passenger trip. It is recommended that a lifeline service be provided to the Feather River Hospital.

Regional Routes

The feedback received during the public participation process and the on-board survey is that the regional routes are generally working well; the passenger productivity statistics presented earlier support this finding. In the preferred alternative, the service levels would remain the same. However, in order to coordinate better with Route 15 and to provide better access to the Chico Mall area, the routing in Chico for Routes 20, 40 and 41 would all change.

Route 20 would exit SR99 at Skyway in Chico, turn left on Notre Dame, turn left on Forest serving the Butte College–Chico Campus and the Walmart Transfer Point, turn left onto E. 20th to serve the front side of the Chico Mall before reentering SR99 and continuing on the remainder of the original route. In Oroville, Route 20 would no longer run the one-way loop to Oro Dam Blvd., Feather River, Mitchell Ave to Spencer Ave.; it would terminate at the Oroville Transit Center (OTC). This loop had a low number of boardings, and required passengers to wait at the OTC for as much as 10 minutes before continuing to Chico.

Route 40 would also exit SR99 at Skyway in Chico, turn left on Notre Dame, turn left on Forest serving the Butte College–Chico Campus and the Walmart Transfer Point, turn left on 20th to Fair (as it currently does on weekends), then continue on its current route to the downtown Chico Transit Center. The routing is shown in Exhibit 3.

Route 41 would follow the same routing as route 40 to the Walmart Transfer Point, but would terminate at the Chico Mall on the Springfield loop. The routing is shown in Exhibit 3.

Schedule Framework

The next four pages show a scheduling framework and transfer connections at the Chico Transit Center, Walmart Transfer Point, and Oroville Transit Center. Significant connectivity is provided in the recommended preferred alternative.

At the Chico Transit Center, during the morning, service would depart at :50 past the hour for Routes 2/7, 3, 4, and 5. In the afternoon at 3:10, to better serve CSUC and schools, the time would be shifted to :10 after the hour.

Route 15 would provide 15-minute service and would depart the Chico Transit Center at :05, :20, :35 and :50 during peak periods and at :20 and :50 during the midday. Service in the evenings would be at :10 with a 60-minute frequency.

The Walmart Transfer Point would also have Route 15 service at 15-minute frequencies for trips downtown. This enables frequent service without a need to have timed transfers on all routes. That would be difficult given the various running times of routes meeting at the Walmart Transfer Point. There are limited transfer opportunities between other routes. For example, Route 5 arrives at :30 after the hour at the Walmart Transfer Point with a good connection to the :40 departure of Route 40.

At the Oroville Transit Center, good transfer opportunities to Route 20 will exist for Routes A, C, and D. On Route B serving Thermalito, a good transfer opportunity to Route 20 would be available at Public Works at the County Center.

**DOWNTOWN CHICO
CHICO TRANSIT CENTER
OUTBOUND**

<u>Route</u>	<u>Times</u> <u>Departure</u>	<u>To</u>
2	:50 :10 3:10 PM on	Chico local
3	:50 :10 3:10 PM on	Chico local
4	:50 :10 3 PM on	Chico local
5	:50 :10 3:10 PM on	Chico Mall
8	:18, :48	Chico campus local
9	:18, :48	Chico campus local
15	:50, :05, :20, :35 AM peak :20, :50 off-peak :10, :25, :40, :55 PM peak	Chico campus local
20	:50	North and South
40	:50 till 3:50 PM :20 from 4:20 PM on	Oroville Paradise
41		

**DOWNTOWN CHICO AND CHICO MALL (WALMART TRANSIT CENTER)
OUTBOUND**

<u>Route</u>	<u>Chico Transit Center</u>	<u>Arrive Walmart Transit Center</u>	<u>To</u>
5	:50 AM :10 PM	:10 AM :30 PM	Walmart Transit Center
2/7	:50 AM :10 PM	:50 AM	PVHS / Chico Mall
15	:50, :05, :20, :35 AM Peak :20, :50 Off-Peak :10, :25, :40, :55 PM Peak	:15, :30, :45, :00 AM Peak :15, :45, Off-Peak :20, :35, :50, :05 PM Peak	Chico Mall Chico Mall Chico Mall
20	:50 all day	:05 all day	Oroville
40	:50 AM :20 PM	:10 AM :40 PM	Paradise
41	Originates Walmart Transfer Point	:25 AM :30 PM	Paradise

**CHICO MALL (WALMART TRANSIT CENTER) AND DOWNTOWN CHICO
INBOUND**

<u>Route</u>	From:	<u>Walmart Transit Center</u>	<u>Chico Transit Center</u>
5	Chico Downtown	:20 AM :40 2:40 PM on	:45 AM :05 3:05 on
7	Walmart	:50 AM :10 PM	connects with Route 2 at Lassen and Ceres
15	Chico Mall	:15, :30, :45, :00 AM peak :20, :50 off-peak :05, :20, :35, :50 PM peak	:10, :25, :40, :55 AM peak :15, :45 off-peak :05, :20, :35, :50 peak
20	Oroville	:30 till 5:35 PM Variable after 5:45	:45 til 5:45 Variable after 5:45 pm
40	Paradise	:27 to 4:27 PM Variable after 4:27	:40 till 4:40 p.m. Variable after 4:40
41	Paradise	:20 to 1:20 PM :40 3:40 PM on	Originates from Walmart Transfer Point

**Oroville Transit Center
INBOUND
M - F**

ROUTE	AM	PM
A	:52	:05
B	:18	:12
C	:27	:40
D	:44	:38
20	:40	:40 / :10
30	:17	:17

**Oroville Transit Center
OUTBOUND
M - F**

ROUTE	AM	PM
A	:29	:40
B	:44	:40
C	:52	:05
D	:20	:14
20	:55	:55 till 6:06 PM
30	:42	:42

Exhibit 5 is a summary of the hours allocation for Chico local routes, Oroville local routes and the Regional routes. The allocation of hours is quite different than the status quo, but keep within the 67,000 annual vehicle revenue hours provided. In Oroville, there is an increase in vehicle revenue hours from 3,532 to 5,610, the most dramatic change. Despite the recommended Route 15 service, there is a slight reduction in Chico vehicle revenue hours. The Regional Route remains fairly constant.

Exhibit 6 is a summary of the service levels proposed for the Chico Routes, Oroville Routes and Regional Routes.

Exhibit 5
Preferred Alternative: Reallocation of Existing Vehicle Revenue Hours

	Daily Weekday	Daily Saturday	Daily Sunday	Annual Total
Chico Routes				
15 (1/6/10)	75.0	21.0		20,217
2	14.5	10.5		4,244
3	14.5	10.5		4,244
4	14.5	10.5		4,244
5	14.5	10.5		4,244
7	6.0			1,530
8	14.5			2,320
9	14.5			2,320
Commuter Routes	8.0			1,280
Chico Subtotal	176.0	63.0	0.0	44,641
Oroville Routes				
Route A and C	11.0			2,805
Routes B and D	11.0			2,805
Paratransit	-8.0			
Oroville Subtotal	22.0	0.0	0.0	5,610
Regional Routes				
20	20.4	9.9	9.9	6,215
30	4.8	7.0	0.0	1,575
31	1.8	0.0	0.0	463
40	16.3	10.9	7.9	5,130
41	13.3	1.4	0.0	3,471
Total, regional	56.6	29.1	17.7	16,854
Grand Total	254.6	92.1	25.6	67,105

Exhibit 6 Preferred Alternative Reallocation of Service Hours: Service Levels

	Weekdays					Saturday			Sunday		
	Span of Service		Frequency (Minutes)			Span of Service		Freq.	Span of Service		Freq.
	Start am	End pm	Peak	Midday	Evening	Start am	End pm	Minutes	Start	End	
Chico Routes											
15 (1/6/10)	6:15	9:45	15	30	60	8:50	7:15	60	-	-	-
2	6:15	7:45	60	60	60	8:50	7:15	60	-	-	-
3	6:15	7:45	60	60	60	8:50	7:15	60			
4	6:15	7:45	60	60	60	8:50	7:15	60	-	-	-
5	6:15	7:45	60	60	60	8:50	7:15	60	-	-	-
7	6:15	6:15	60	Peak Period only							
8	7:30	10:00	30	30	60						
9	7:30	10:00	30	30	60	-	-	-	-	-	-
Commuter Routes			Timed to school bell times								
Oroville Zonal DAR											
Route A and C	6:30	6:30	60	60							
Route B and D	6:30	6:30	60	60							
	One hour schedule break during midday										
Regional Routes											
20	5:50	7:20	60	120	30	7:50	5:42	120	7:50	5:42	120
30	7:42	5:17	240	240	240	8:42	4:47	120	-	-	-
31	6:37	6:00	2 trips/day			-	-	-	-	-	-
40	6:50	7:31	60	120	~90	7:50	6:41	120	9:50	5:42	120
41	6:03	6:51	60	120	100	2 trips/day			-	-	-