

Chapter 4

SERVICE OPERATING PLANS

INTRODUCTION

A series of operating plans were prepared to evaluate different service levels and needed capital improvements in sidings and equipment, which are discussed in Chapter 5. The plans also facilitated estimation of operating costs, discussed in Chapter 4. The plans reflect the following service options between:

- Healdsburg and downtown San Rafael
- Cloverdale and downtown San Rafael
- Healdsburg and Petaluma
- Cloverdale and Petaluma
- Petaluma and downtown San Rafael

For each of these service options, schedules were developed for 30-minute peak hour headways¹ and for 45-minute peak hour headways. Thirty-minute headways were judged to be the optimum service level, while 45-minute headways represent a minimum level of service for a start-up rail service. If headways were greater than 45 minutes, the service would have difficulty attracting commuters because there would be only a very limited number of trains arriving at employment centers during the peak hours². A likely consequence would be that the service would be perceived as too inconvenient compared to auto commuting even on crowded roadways.

Forty-five-minute headways would be adequate for a start-up. This level of service is consistent with current service levels of the San Diego Coaster, with trains about 45 minutes apart during peak periods, and of the Los Angeles Metrolink Ventura line, with trains about 40 to 45 minutes apart at peak periods. The Coaster will transition to 30-minute headways in 2005. The same pattern of 45-minute headways at start-up, transitioning to 30-minute frequencies in the eighth year, is the service pattern envisioned for the Sonoma-Marín rail service.

OPERATING PLANS FOR SERVICE OPTIONS

Identification of service operating plans is a necessary step towards patronage forecasts, estimates of capital and operating costs, and evaluation of potential environmental impacts.

¹ Headway is the interval between trains, sometimes also described as frequency.

² With trains leaving westbound from Stockton at more than 45 minutes apart, Altamont Commuter Express (ACE) is an exception to this general rule. However, ACE serves primarily one market – long westbound morning commutes into San Jose. This would not be the case in Sonoma and Marin, where there are both northbound and southbound morning commutes of relatively short distance.

Typically, patronage will be affected by the number of trains operated, particularly during the peak morning and evening commute periods. A higher level of service will attract more commuters than will a minimal service. Similarly, capital costs will differ depending on the level of service, because the higher levels require more trainsets and more sidings. Higher service levels may have differing environmental impacts related to increased operations and to the greater number of sidings that will need to be provided.

The options described below are summarized in Table 4-1, Comparison of Service Operating Plans. The five service options are identified by abbreviation. For example, Healdsburg to downtown San Rafael is “Hea-SRf”; Cloverdale to downtown San Rafael is “Clo-SRf”; and so on. A plan is identified for each option based on 30-minute headways and 45-minute headways. From these options, the numbers and locations of sidings, the number of trainsets (excluding spares), and operating costs can be determined. The plans assume locations of storage, maintenance and layover facilities, where trains remain idle, awaiting early morning or late evening runs.

Table 4-1
Comparison of Service Operating Plans³

	30-m. Hea-SRf	45-m. Hea-SRf	30-m. Clo-SRf	45-m. Clo-SRf	30-m. Hea-Pet	45-m. Hea-Pet	30-m. Clo-Pet	45-m. Clo-Pet	30-m. Pet-SRf	45-m. Pet-SRf
Train Sets Required	6	4	6	4	4	3	4	3	3	2
Trains Operated Per Day	32	24	32	24	28	24	28	24	22	18
Cloverdale-Healdsburg	0	0	10	8	0	0	6	8	0	0
Healdsburg-Petaluma	28	24	28	24	28	24	28	24	0	0
Petaluma-San Rafael	26	20	26	20	0	0	0	0	22	18
Train Miles Per Day	1,384	1,136	1,556	1,274	812	696	915	834	484	396
Peak Headway (Hr:Min)	0:30	0:45	0:30	0:45	0:30	0:45	0:30	0:45	0:30	0:45
Mid Day Headway	2:00	2:15	2:00	2:15	2:00	2:15	2:00	2:15	2:00	2:00
Sidings Required	5	3	6	4	3	2	4	3	2	1
Arrivals 7-9 AM										
South into Santa Rosa	3	3	3	3	3	3	3	3	--	--
South into Petaluma	4	3	4	3	4	3	4	3	--	--
South into San Rafael	4	3	4	3	--	--	--	--	4	3
North into Santa Rosa	4	2	4	2	3	2	3	2	--	--
Departures 4-6 PM										
North from Santa Rosa	3	2	3	2	4	2	4	2	--	--
North from Petaluma	4	3	4	3	4	3	4	3	--	--
North from San Rafael	4	2	4	2	--	--	--	--	3	2
South from Santa Rosa	4	3	4	3	4	3	4	3	--	--

³ Operating schedules for the Cloverdale – San Rafael at 30 and 45-minute peak period frequencies appear in Appendix 1.

Service Between Healdsburg and San Rafael (Hea-SRf)

This option would serve the four primary commute markets in the two-county area:

- λ Southbound into Santa Rosa
- λ Southbound into Petaluma
- λ Southbound into San Rafael
- λ Northbound into Santa Rosa

With 30-minute headways, there would be sufficient service to provide three or four morning arrivals between 7 and 9 a.m., and three or four evening departures between 4 and 6 p.m., in each of the four primary commute markets. The service would require six trainsets (excluding spares). Three trainsets would depart Healdsburg each morning for San Rafael, where they would reverse to make northbound trips. Three trainsets would depart Petaluma each morning, making northbound runs to Healdsburg where they would reverse to make southbound trips. During the mid-day hours, two trainsets would lay over at Healdsburg, and another two trainsets would lay over at Petaluma. The remaining two trainsets would continue operating through the day to provide service at two-hour headways. For the evening commute period, the four layover sets would be cycled back into service to provide the maximum of six trainsets required to maintain a 30-minute headway. The equipment operation would total 1,384 train-miles per day.

This service pattern would require a storage and layover facility at Healdsburg, which would probably also function as the maintenance base for the equipment. A secondary facility for mid-day and overnight storage would need to be located at Petaluma. Five passing sidings would be required between Healdsburg and San Rafael.

The 45-minute headway option would provide a similar pattern of service. However, this less frequent operation of trains would require only four trainsets. Two would begin service southbound from Healdsburg in the morning, and two would start northbound at Petaluma. With this option, there would be two to three arriving and departing trains during the peak hours to serve the four major markets. Train operations would total 1,136 train-miles per day. Because trains would be required to meet less often, only three sidings would be required.

Service Between Cloverdale and San Rafael (Clo-SRf)

This service option is basically the same as the one described above, but would locate the northerly storage and layover facility at Cloverdale. Service would commence there in the mornings and conclude there in the evenings. Northbound trains not needed for mid-day service also would layover at Cloverdale. The number of required trainsets would be unchanged.

With 30-minute headways, one additional siding (for a total of six) would be required. With 45-minute headways, one additional siding also would be required, making a total of four for the entire route. The number of trains arriving and departing the major commuter destinations

during the morning and evening peak hours would be the same as in Healdsburg to San Rafael. Daily train-miles would be 1,556 with 30-minute headways, and 1,274 with 45-minute headways.

Service Between Healdsburg and Petaluma (Hea-Pet)

This option would serve three of the four primary commute markets, operating solely within Sonoma County:

- λ Southbound into Santa Rosa
- λ Southbound into Petaluma
- λ Northbound into Santa Rosa

With 30-minute headways, service would include three or four morning arrivals between 7 and 9 a.m., and three or four evening departures between 4 and 6 p.m., in each of the three commute markets. The service would require four trainsets. Two trainsets would depart southbound from Healdsburg each morning, and two trainsets would depart Petaluma each morning on northbound runs to Healdsburg. During the mid-day hours, one trainset would lay over at Healdsburg, and a second trainset would lay over at Petaluma. The remaining two trainsets would continue operating through the day to provide service at two-hour headways. For the evening commute period, the two layover sets would be cycled back into service to provide the maximum of four trainsets required to maintain a 30-minute headway. The equipment operation would total 812 train-miles per day.

This 30-minute service pattern would require a storage and layover facility at Healdsburg, which would probably also function as the maintenance base for the equipment. A secondary facility for mid-day and overnight storage would need to be located at Petaluma. Three passing sidings would be required between Healdsburg and Petaluma.

The 45-minute headway option would provide a similar pattern of service, but the less frequent operation of trains would require only three trainsets. Two would begin service southbound from Healdsburg in the morning, and one would start northbound at Petaluma. Two sets would lay over at Healdsburg during the mid-day hours, while the third would provide service on a two-hour 15-minute headway. With this option, there would be two to three arriving and departing trains during the peak hours to serve the three commuter markets. Train operations would total 696 train-miles per day. Because trains would meet less often, only two sidings would be required.

Service Between Cloverdale and Petaluma (Clo-Pet)

This schedule option is basically the same as Healdsburg to Petaluma described above, but would locate the northerly storage and layover facility at Cloverdale. Service would commence there in the mornings and conclude there in the evenings. Northbound trains not needed for mid-day service also would lay over at Cloverdale. The number of required trainsets would be unchanged.

With 30-minute headways, four sidings would be required. With 45-minute headways, only three sidings would be necessary. The number of trains arriving and departing the major commuter destinations during the morning and evening peak hours would be the same as in Healdsburg to Petaluma. Daily train-miles would total 915 with 30-minute headways, and 834 with 45-minute headways.

Service Between Petaluma and San Rafael (Pet-SRf)

This option would only provide service to one of the four identified commute markets, that being the southbound commute into San Rafael. Service would only be provided from Petaluma, just north of the Marin County Line.

Thirty-minute headways could be provided by only three trainsets. There would be three to four peak hour arrivals and departures at San Rafael. Three trainsets would depart Petaluma southbound each morning. Two of these would layover in Petaluma, while the third would provide mid-day service with a two-hour headway. All three sets would again be required for the evening peak service. The 30-minute service would account for 484 daily train-miles. The service would require two sidings.

With 45-minute headways, only two trainsets would be needed. Both would start southbound from Petaluma in the mornings. One would layover during the mid-day hours, while the second set would provide service with two-hour headways. There would be two to three peak hour arrivals and departures. The 45-minute service would cover 396 daily train-miles and would require only one siding.

Siding Locations

Siding locations are dictated by the service frequency, with a greater number of sidings required as the headway decreases. This analysis covers only those sidings required for passenger service, and does not address any facilities required for freight. In developing the service options, the attempt was made to utilize existing sidings where feasible, in order to minimize the impacts of constructing new sidings. However, the existing sidings on the railroad do not correspond to the precise spacing required for dependable operation of time-sensitive commuter service. As a result, some new siding construction would be necessary under any schedule option.

The analysis of operating schedules assumes that sidings would be restricted to 30 mph operation, and would be approximately 3,000 feet in length. Main line trackage would be allowed a maximum of 79 mph, though the normal top speed would be 60 mph, except where curves impose a lower limit. Trains in each direction would be allowed adequate schedule time to pass through the siding. This assumption would provide just over one minute of excess time for the train that holds the main line, and would allow a small margin for a train that might be operating slightly behind schedule to make up some time during its run.

Table 4-2, Comparison of Existing Sidings and Required Sidings, shows current siding locations along with those required for optimum operation of 30-minute and 45-minute headways.

Table 4-2
Comparison of Existing Sidings and Required Sidings

Existing Sidings Milepost	Required Sidings (30-Minute Headway) Milepost	Required Sidings (45-Minute Headway) Milepost
85.2 Cloverdale (0.5 mile)		
83.5 Unnamed track (0.4 mile)		
81.0 Asti (0.4 mile)		
75.8 Geyserville (1.2 mile)		
71.9 Lytton (0.5 mile)	71.7 Extend/rebuild existing siding	72.5 Extend/rebuild existing siding
68.0 Healdsburg (0.4 mile)		
67.2 Bailhache (0.7 mile)		
62.9 Windsor (0.4 mile)	62.4 Extend/rebuild existing siding	
54.5 Santa Rosa (0.8 mile)		55.8 New siding north of existing
53.3 Santa Rosa (0.4 mile)	52.0 New siding south of existing	
39.3 Park (0.4 mile)	41.0 New siding north of existing	41.0 New siding north of existing
38.0 Petaluma (0.7)		
31.3 Burdell (1.2 mile)	31.0 Upgrade existing siding	
25.0 Ignacio (0.7 mile)	21.0 New siding north of Civic Center	25.0 Extend/rebuild existing siding