

Technical Advisory Committee DRAFT FINAL

The Long Term Financial Feasibility of the Northwestern Pacific Railroad

Humboldt Bay Harbor, Recreation
and Conservation District

PB Ports & Marine
Parsons Brinckerhoff Quade & Douglas, Inc.

**In Association with
Winzler & Kelly
BST Associates**

July 2002



CONTROLLING DEPTHS FROM
TABLE ONE
HARBOR CHANNEL
OUTER REACH
INNER REACH
SAMOIA CHANNEL
TURNING BASIN
A. SHOULDING TO 40.4 FEET IN THE OUT
B. SHOULDING TO 30.3 FEET IN THE OUT
C. SHOULDING TO 28.8 FEET AT 40°45'
D. SHOULDING TO 28.8 FEET AT 40°45'
E. SHOULDING TO 28.8 FEET AT 40°45'
F. SHOULDING TO 28.8 FEET AT 40°45'
G. SHOULDING TO 28.8 FEET AT 40°45'
H. SHOULDING TO 28.8 FEET AT 40°45'
I. SHOULDING TO 28.8 FEET AT 40°45'
NOTE-CONSULT THE CORPS OF EN

EXECUTIVE SUMMARY

Introduction

The North Coast Railroad Authority (NCRA) and the Humboldt Bay Harbor, Recreation and Conservation District (Port) operate in a unique, interdependent relationship on California's north coast, between the Bay Area and Eureka/Arcata. The Port views the rail line as vital to its long-term success as a maritime center, and the NCRA views the Port as a key potential market for its operation as well. With Port volumes in decline and the rail line currently out of service, both agencies are interested in identifying market and operating scenarios that will enable them to restore service for the benefit of the region.

As a result, two companion studies have been commissioned to evaluate feasible scenarios for revitalizing each operation: the *Port of Humboldt Bay Harbor Revitalization Plan*, which will be completed in December 2002, and this study, *The Long Term Financial Feasibility of the Northwestern Pacific Railroad*, which was undertaken first. The Humboldt Bay Harbor, Recreation and Conservation District is the contracting agency for the two studies; however, numerous other funding agencies and stakeholders are participating in the study efforts.

Northwestern Pacific Railroad Background

As stated in the North Coast Railroad Authority's Strategic Plan for Resumption of Viable Rail Service for California's North Coast (April, 2001):

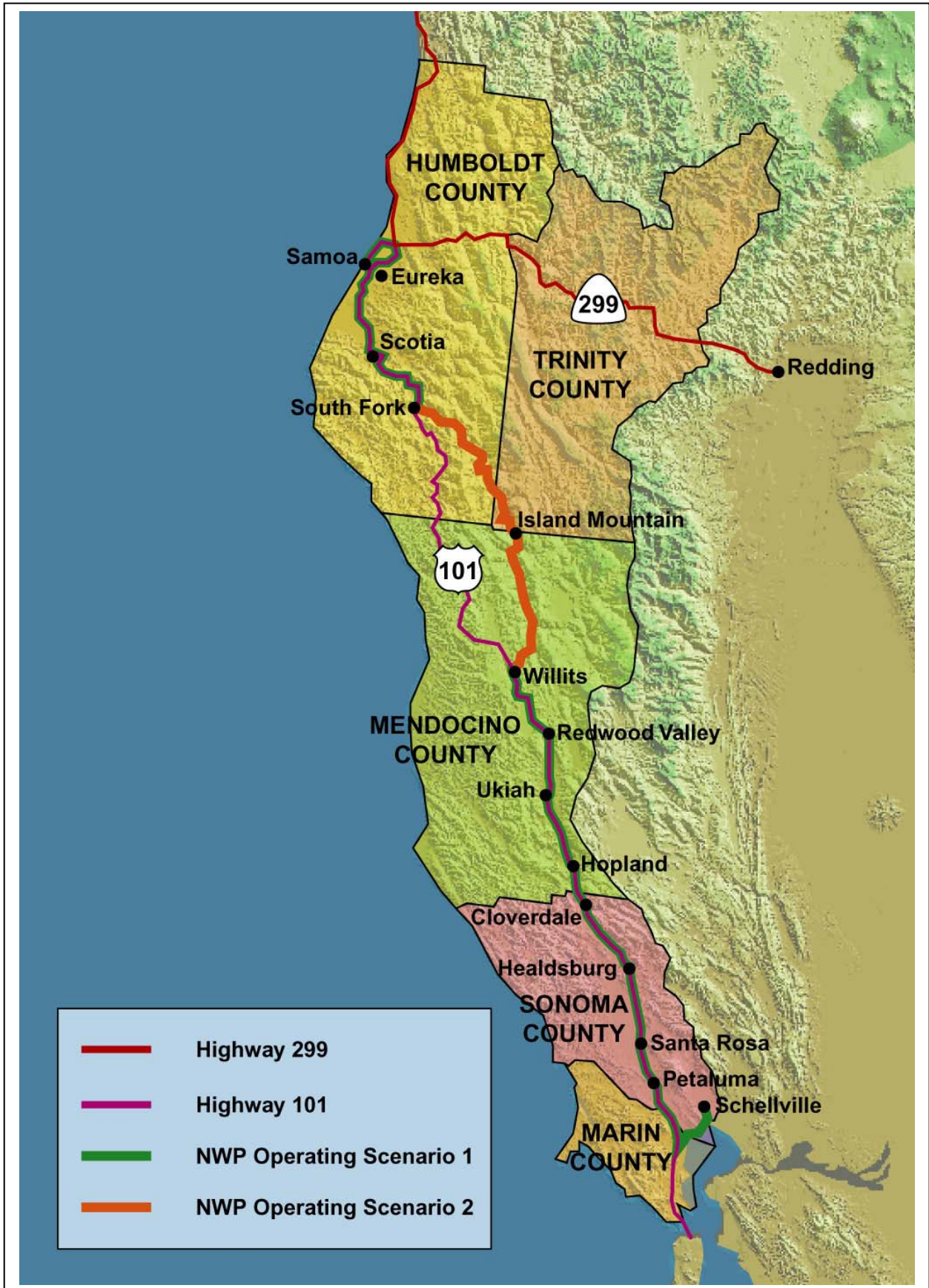
Rail service on the North Coast dates well back into the 19th century. Completion of the connection between Eureka and San Francisco was attained in 1914. Designated the Northwestern Pacific Railroad (NWP), it was jointly owned by Santa Fe and Southern Pacific and operated independently until 1929 when it became exclusively part of Southern Pacific.

In 1989 the California Legislature created the North Coast Railroad Authority (NCRA). Utilizing State provided funding this new authority acquired the former Eureka Southern out of bankruptcy in 1992. The NCRA acquired that portion of the NWP between Willits and Healdsburg from Southern Pacific in 1996.

The remaining portion of the NWP south of Healdsburg is now owned by the Northwestern Pacific Railroad Authority (NWPRRA), a joint powers agency comprised of NCRA, the Golden Gate Bridge, Highway, and Transportation District, and the County of Marin. Freight service and related maintenance of this portion of the railroad is the responsibility of NCRA under an agreement with NWPRRA.

With the exception of sporadic service provided through 2001 on the southern end of the railroad between Penngrove and Schellville, there has not been significant freight activity along the corridor since 1997, which was the last year the entire 300-mile line was in operation.

The Northwestern Pacific Railroad and Operating Scenarios



Intercity passenger service has operated in this corridor since the early 1900's. However, the service began to wane in the 1920's as the roadway system expanded and automobile usage increased. In 1941, most of the train service was replaced by buses that could cross the Golden Gate Bridge into San Francisco. Any remaining intercity passenger train service was eliminated in 1971. Since then, the only passenger service in the corridor has been the operation of excursion trains.

Due to its topography, remoteness and other factors, the Northwestern Pacific Railroad is one of the most difficult railroads in the United States to maintain. When the Southern Pacific Railroad entered abandonment proceedings for the line in 1982, they estimated that the Northwestern Pacific cost them 2 to 3 times their normalized maintenance costs for all other Southern Pacific railroads across the country. Over the ensuing 20 years there was no evidence that the railroad became any less expensive to maintain. In fact, given the deferred maintenance on much of the line, the capital and maintenance costs that are currently under development by the NCRA will reflect these higher capital and maintenance costs.

Given the recent state of disrepair, the Northwestern Pacific Railroad has had a very difficult time keeping the line open and providing consistent freight service. In the last few years (1996-1997) of operation of the complete 300-mile line (Samoa to Shellville), the railroad handled approximately 6,800 cars. The service was considered to be unreliable and slow. In fact, when the storms in 1998 hit, several customers' shipments were trapped on the railroad, never making it to market.

Market Analysis

Economic Setting

The economic setting along the NWP corridor is marked by low growth and decline in the northern end and relatively robust growth to the south. The region's (Humboldt, Mendocino and Sonoma counties) population base is expected to reach 962,850 persons in 2030, which amounts to annual growth of 1.0% to 1.5%, depending on the decade being evaluated. Humboldt County is expected to grow much slower than the other two counties (i.e., 0.3% to 0.5% versus 1.1% to 1.7% per year).

In Humboldt County, employment in the manufacturing sector increased from 5,700 jobs in 1983 to a peak of 7,000 in 1996 before falling significantly to 5,300 in 2001. Most (64%) of the manufacturing base is composed of forest products manufacturing. However, the manufacturing sector is diversifying into other miscellaneous durable (9% of manufacturing employment) and non-durable (26% of manufacturing employment) goods production.

In Mendocino County, employment in the manufacturing sector increased slightly from 4,700 jobs in 1983 to 4,820 in 2001. A substantial portion (42%) of the manufacturing base is also composed of forest products manufacturing. However, the manufacturing sector is more diversified in Mendocino County than in Humboldt County.

Approximately 22% of manufacturing employment is in other durable manufacturing and 36% in non-durable (including 1,700 jobs in food processing).

Sonoma County's proximity to San Francisco Bay has resulted in a different, more diverse employment base. Employment in the manufacturing sector increased substantially from 15,600 jobs in 1983 to 32,300 in 2001 or at a rate of 4.1% per year. Lumber and wood products only represented 1,000 jobs in 2001, down from a peak of 2,200 in the late 1980s/early 1990s. Most of the manufacturing base is in high-tech (10,600 jobs in scientific instruments and 2,900 in electronics) and food processing (8,700).

Methodology

The objective of the freight rail demand assessment is to develop estimates and forecasts of potential freight rail service on the NWP, and identify potential key users of the freight rail service. The first step in analyzing the freight rail market is data analysis. The objective of this task was to summarize the economic conditions within the corridor and to identify potential freight shipment generating sectors. The second step was to identify and conduct interviews with existing shippers and likely future candidates along the corridor. A survey form was developed, reviewed with the TAC and refined (see Appendix A for the interview questions). An interview list was prepared and then screened to identify the most likely users of the system. As a third step, interviews were undertaken with truckers and rail carriers serving or connecting to the system to determine existing levels of service to the impacted area and the potential for additional service.

Freight Demand

Low, Medium and High Demand

As a part of the interviews, shippers were asked to define how many rail cars they would be willing to move on the NWP system if the service provided a consistent, reliable, and cost effective level of service. They were asked for a specific number of rail cars that they would ship, which then became their "medium" forecast, and then bounded that estimate with "low" and "high" numbers. Accordingly, the low, medium and high demands have an implicit probability assigned to them:

- **The low demand** probability is conservative,
- **The medium demand** probability is consistent with what could be expected from the shipper in the short term,
- **The high demand** probability is an optimistic forecast.

Products that had not previously moved by rail in significant volumes (i.e., solid waste, aggregates, port traffic) were only included in the high scenario. In addition, the high scenario assumed that mills that had been recently shut down (Blue Lake Forest Products and Eel River Sawmill) would be restarted.

Freight Demand Summary

The following table summarizes the commodities that would most likely be shipped over the Northwestern Pacific. Descriptions of the following market sectors follow.

Table 6-5 – Estimated Rail Traffic by Commodity per Year (full rail cars)

Commodity	Total 96/97	Outbound				Inbound			
		Actual 96/97	Low	Medium	High	Actual 96/97	Low	Medium	High
Forest Products	5,238	4,482	3,842	5,682	7,953	756	2184	3,017	3,450
Feed Mills	435					435	304	422	540
Miscellaneous	108	104	64	102	143	4	50	57	64
Aggregates				135	6,270				
Solid Waste					1000				
Port Related					3,000				
Total*	5,781	4,586	3,906	5,919	18,366	1,195	2,538	3,496	4,054

Source: Interviews, BST Associates

* The total number of railcars for 1996/97 is approximately 1,000 less than the number shown here, because shippers responsible for the 1,000 cars were unattainable for this study and are therefore not shown.

The market study assumes that the level of service provided by the newly proposed rail service would be superior to the service provided in 1996/97 and at rates that provided benefit (i.e., cost savings) to local shippers. The analysis assumes that it would take a few years to demonstrate that the service was improved and that during these years, market share would increase to 100% of market potential under low, medium and high scenario estimates.

Forest Products

Forest products mills are expected to continue to be the mainstay of the railroad for the foreseeable future because of the volumes, commodity characteristics and distances involved. Forest products generated 4,482 outbound and 756 inbound rail cars in 1996/97 or more than 75% of all traffic. Survey results indicate that these firms could generate between 6,000 and 11,400 railcars per year, depending on the operating scenario. The potential traffic in this report includes both inbound and outbound traffic and assumes that the level of service and rates that the NWP would offer would capture a larger market share than the operating railroad did in 1996/97.

Feed Mills

The feed mills are located in the south end of the corridor at Petaluma and Novato. These mills obtain grain from the Midwest (mostly corn, but also soy, barley, etc.) and Canada (canola) in bulk hopper cars. Most of the product comes via the Union Pacific (UP) Railroad to Napa Junction with transit to Petaluma by California Northern Railroad and

the NWP. The surveys indicate that feed mill operators could generate 304 to 540 railcars per year of freight traffic on the NWP.

Aggregates

Aggregate production along the NWP corridor in Humboldt and Mendocino Counties has typically been used to serve local community demand in the past. Small volumes of aggregate moved on the railroad in 1996/97, mainly serving the local communities and industries. A market could exist in the Bay Area for aggregates from the North Coast, depending on a variety of environmental, economic and competitive factors. On the high side, aggregate shippers could generate up to 400,000 cubic yards or 6,270 railcars per year of traffic.

Given the time and budget for this report, the report goes as far as it can to identify the potential for aggregates but there are significant uncertainties, including environmental issues and price of the delivered product. Due to these uncertainties, the potential for aggregates was only placed in the high scenario and was limited to the known potential quantities that are permitted and above the level of local demand

Solid Waste

Humboldt County generates 80,000 tons of solid waste per year (approximately 200 tons per day Monday through Friday), which is growing at the same rate as population growth. The County was interested in having all of this product move by rail. However, the existing facility is not served by rail and there is no way to bring rail to the existing facility without relocating other businesses or crossing a wetland. If logistical, economic and environmental issues can be addressed, solid waste from Humboldt County could generate up to 1,000 railcars per year of freight traffic

The solid waste authority and its vendor indicate that they could use rail if it were available and cost effective (including all costs such as drayage to rail served locations). Due to these uncertainties, the potential for solid waste was only placed in the high scenario. However, the shift to rail would be expensive and would require a long-term commitment (approximately \$6 million capital outlay). The County would put waste in 12-foot high containers (64 cubic yards per container) and could get 4 containers on flatcars. They would need service 5 or 7 days per week. If rail service were considered viable, it would require direct access to Eureka, not a reload facility at Willits.

Freight Competition Issues

The success of the NWP depends significantly upon its relationship with the UP Railroad. In discussions with the UP Shortline coordinator, it was indicated that the UP supports re-establishing rail on NWP. UP is, however, concerned about outstanding expenses on the railcars that have been trapped on the north end of the rail line since the Eel River Canyon section was washed out. UP wants to negotiate a solution for this problem in the near-term future. UP's Redding reload facility serves much of Northern California in

addition to the Humboldt area, including lumber shippers north and east of Redding. Consequently, the operation likely enjoys substantial economies of scale, both in the reload operation itself and in terms of UP's train operations. The development of a Willits reload operation could likely expect significant competition from Redding, based on that operation exercising and protecting its economies of scale. The only way to attract shippers from Humboldt to a reload facility at Willits/Redwood Valley would likely be with major price incentives.

Port-related Freight Opportunities

Based on the trade and competitive conditions in West Coast marine cargo markets and the rail shipper surveys, the most likely areas of opportunity for rail-related port traffic are marine industrial cargoes, inbound forest products, and outbound aggregates. Given the availability of the 38-foot channel access, waterfront sites, relatively low-cost land, utilities, labor, a highly livable environment, and serviceable highway and rail access, the Port of Humboldt Bay should be competitive for certain marine industrial project opportunities. While rail and highway access may be more limited than at some other locations, it should be sufficiently serviceable for industries attracted to Humboldt Bay's other positive attributes for manufacturing. Success in attracting a new marine industrial tenant will not necessarily come quickly, requiring three to five years or more for site preparation, marketing and the right opportunity to materialize. Rail volumes from a marine industrial plant could range up to about 400,000 tons, or 3,000 to 4,000 railcars per year.

Passenger Demand Methodology

In general, the process for evaluating the feasibility of each type of passenger service was based upon characteristics of the NWP corridor and the comparison of these characteristics to similar service that operates elsewhere in California or previously within the NWP corridor. Traditionally, viability of intercity and commuter rail is influenced by travel patterns, population densities and travel times. This evaluation utilizes the work previously completed for the SMART Commission corridor in March 2002 and on *the Feasibility of Intercity Rail Passenger Service on San Francisco Bay Area – Eureka Corridor, No. 01D290, Phase I Final Report*. The viability of excursion rail was also considered. The market for excursion rail is different than the market for intercity and commuter. Excursion rail focuses on trips that are made for the experience itself, not for travel between one point and another. An excursion trip should be considered "recreation" instead of "transportation." These trips are less time- and cost-sensitive. Also, the equipment used as well as entertainment/attractions on-board and off-train are important.

Passenger/Excursion Opportunities

The estimation of ridership levels for each of the operating scenarios was based on the ridership levels experienced by the other excursion railroads profiled in this report. Passenger volumes at six other excursion operations in Northern California ranged from about 90 to over 300 per day, or 7,000 to 200,000 per year. Based on this data and other analyses, excursion demand was estimated to range from less than 6,000 passengers per year to over 100,000 depending on the operating scenario and marketing outlook. Due to the relatively low population density along travel times on the NCRA corridor, intercity passenger service demand was not found to be sufficient to warrant further analysis.

Market Analysis Conclusions

The freight market potential along the NWP corridor is relatively flat. Overall the greatest opportunity for growth in rail related shipments are in solid waste, aggregate and port-related marine industrial activities. The demand for intercity passenger rail on the corridor is fairly limited and would not prove to be a cost effective endeavor. Commuter rail is currently under study by the SMART commission and could prove to be viable at some level. However, there is little viability for commuter rail outside of the San Rafael to Cloverdale corridor. Excursion rail would be the most viable form of passenger related rail service in the NWP corridor besides the above-mentioned commuter. There are several opportunities for excursion routes throughout the NWP corridor.

Operations Analysis

Operating Scenarios

Throughout the document there are references to “FRA Class 1, 2 and 3” conditions, these classes are dictated by the federal law CFR 213.9. These classes are a reference to the condition of the track, its geometry and its associated maximum allowable speed. The following table summarizes the FRA classes and their associated speeds.

FRA (CFR 213.9) Classes of Track and Associated Maximum Speeds

FRA Class of Track	Max. Freight Train Speed	Max. Passenger Train Speed
Class 1	10 mph	15 mph
Class 2	25 mph	30 mph
Class 3	40 mph	60 mph
Class 4*	60 mph	80 mph
Class 5	80 mph	90 mph

*Under federal regulation, signalization is required if freight trains operating at speeds greater than fifty miles per hour and passenger trains greater than 60 miles per hour. Since the NWP currently does not have signalization, it would have to comply with these speed restrictions, regardless of the class of track.

In conjunction with the NCRA, three operating scenarios were developed and applied to the market forecasts.

- **Operating Scenario I (OS I):** involves a split operation, with rail service from Willits south and South Fork north, leaving the majority of the Eel River canyon out of service. Under this operating scenario, there would be direct train service to all shippers between Willits and Schellville and customers north of Willits with a transload facility in the Redwood Valley area. On the north end of the railroad there would be service provided between South Fork and Samoa. This would allow for excursion operations and enable any shipper along the corridor to connect with the Port of Humboldt Bay to ship to other destinations by water. Service on this section of the railroad would begin operating in the fourth quarter of 2003. (See map)
- **Operating Scenario II (OS II):** the entire route from Schellville to Samoa would be restored. This would allow basic operations through the Eel River Canyon connecting both outbound and inbound freight to the region. (See map)
- **Operating Scenario III (OS III):** the level of service would be raised to five day a week service. The majority of the route would be maintained at the speeds that were accomplished under Operating Scenario II.

RTC Operations Modeling

Using track charts provided by the NCRA and train movements assumptions derived from the operating scenarios above, PB built a dynamic rail simulation model using the Berkeley Simulation Software Rail Traffic Controller (RTC). This model accurately replicates the physical characteristics of the rail infrastructure (track lengths, grade, curvature, and switch geometry), replicates the track-train dynamics over the infrastructure, and simulates train operations based on actual meet, pass and overtake logic used by railroad dispatchers. The simulation was used to model train operations, train miles, train speeds, fuel consumption and other factors used in the analysis.

Financial Analysis

All of the market data, operating scenario data, revenues and O&M costs were built into a financial analysis model that was used to assess financial results under a variety of operating and market scenarios. Volumes were converted to revenues using previous tariff rates and O&M costs were developed based on industry standard costs, regional railroad costs and other factors.

Revenue Assumptions

Given that there has not been freight service on the railroad for several years, it is assumed that it will take time to regain freight volumes from the shippers based on proven, consistent service. To this end, this study has discounted the forecasted revenue rates in the first five years to reflect this period of market penetration. Under OS I, year 1 (2003) revenues are discounted to 40% of the forecasted carload volumes. By 2005 this is increased to 75% of the anticipated revenues and by 2007, the service should have the full amount of the anticipated carloads and revenue. For the years beyond 2008, 0% annual growth in carload volumes was assumed for the next 20 years. The revenue

forecast is based on the January 2000 Freight Tariff NWP 8000(Appendix C). Consistent with the zonal system used in the above freight analysis, the revenue rates for each of the cars by type and destination were calculated. For years 2008 and on, a 2% per year increase in tariff rates was applied consistent with the national average for railroad freight rate increases, according to the FRA.

For all excursion trips between Eureka and Samoa, the fare was assumed to be \$15 for adults and \$10 for children. From Eureka to South Fork, the fare was assumed to be \$30 for adults and \$16 for children. It was assumed that there would be 1% growth in ridership per year. Additionally, it was assumed that inflation would be 3% and fares would track with inflation.

O&M Cost Assumptions

In order to create a representative cost model for the Northwestern Pacific Railroad, this study, created a railroad organization that would represent the necessary positions to operate the railroad

In addition to organizing the railroad geographically, the railroad was organized into the following ‘cost centers’: transportation, mechanical, equipment/vehicles, maintenance of way, insurance, general and administrative, fuel, locomotive leases and car hire/demurrage.

The following elements were not included in the cost model:

- Current or past financial obligations of the NCRA, such as interest;
- Ownership of any equipment;
- Depreciation; and
- Any revenues from miscellaneous sources such as easement leases.

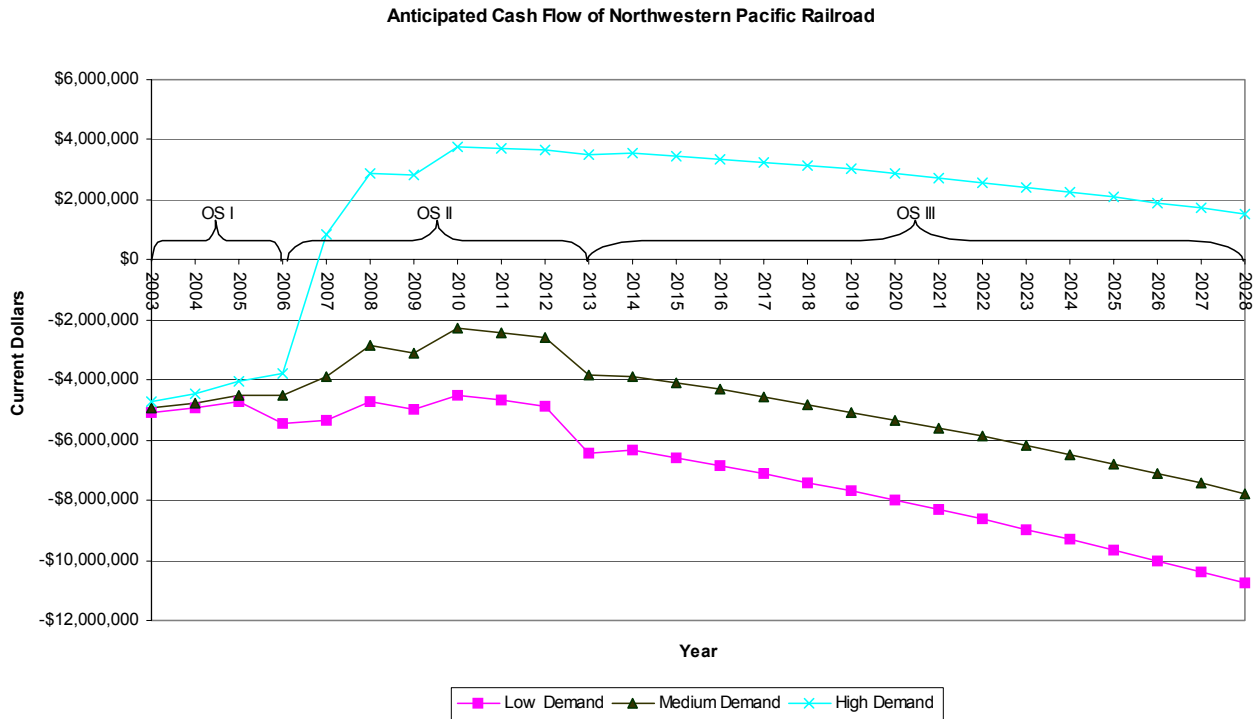
In order to make the cost model represent the most current wage and per unit costs, the study drew upon the following sources:

- The Sonoma Marin Rail Plan, 1999;
- The Northwestern Pacific Year 2000 Budget;
- 1998 Metro North (NY) Budget;
- Interviews with industry experts;
- Parsons Brinckerhoff staff expertise;
- NCRA staff expertise;
- Amtrak; and
- Willdan/HNTB, Northwestern Pacific Capital Assessment.

Since the excursion rail service is based on the use of NWP crews and dispatching, and locomotive rental, the costs are fairly straightforward. It will just be an incremental cost for the use of the above-mentioned cost centers (e.g. transportation and equipment expense) that will be passed along to the passenger franchisee.

Conclusions

Using the above low, medium and high demand levels, combined with operating scenarios one, two and three, the “pro-forma” results are represented in the following chart:



Under the low demand scenario, the railroad will not breakeven for the life of this analysis. If the low demand stays at the same level for the next 25 years, it will not be able to overcome the fixed or variable costs of operating the railroad. Under all three operating scenarios there will be a net negative cash flow under Operating Scenario I. If the medium demand stays at the same level for the next 25 years, it will not be able to overcome the fixed or variable costs of operating the railroad. Under the high demand scenario once the north end of the railroad connects to the south, the railroad is net cash flow positive, averaging just under \$4 million a year for several years.

Given the results outlined in the chart above, the financial model demonstrates that without both aggressive market penetration and a reasonable increase in tariff that is on pace with inflation, it is very difficult to make it to a breakeven point. It is also critical to understand that the railroad is cash flow positive only with the most optimistic projections.

There are several key issues affecting the financial feasibility of the Northwestern Pacific Railroad. These items can be summarized as follows:

1. **300 Miles of Operating Railroad:** The railroad has to operate the entire 300 miles in order to have a positive cash flow. Under Scenario I for all three demand categories, the railroad operated at a loss. The fixed costs of operating a railroad are too high to support the proposed 141-mile route between Willits and Schellville.
2. **Consistency and Reliability:** It will be critical for the railroad to operate consistently for several years to prove that it is a viable operation. Both the NCRA and the shippers that were interviewed expressed this as a significant issue relative to future market penetration. The railroad does not have to be fast and it does not have to be daily, but it does have to be reliable.
3. **Price:** The NWP is wholly dependent on the cooperation of the California Northern Railroad and the Union Pacific Railroad. The rates that the NWP will be able to charge are interdependent with the rates the UPRR and the CNRR will want to negotiate. Additionally it will be critical for the railroad to be price competitive with the trucking industry.
4. **New Markets:** As was underscored in the freight feasibility chapter, it is clear that the addition of new commodities such as aggregates, solid waste or new activity from the Port of Humboldt Bay, (which represent 45% of the high demand), could have a profound impact on the feasibility of the railroad. However, all three of these commodities would require substantial investment in environmental review, facilities and equipment. This type of investment of time and resources would only be put forward if the interested parties were assured of the long-term commitment of the railroad.
5. **Political Capital of Excursion Rail:** While excursion rail service contributes a relatively small amount financially to the bottom line (approximately seven percent), it can provide a positive image of the railroad to the community, possible shippers and government. It could also have a positive multiplier effect on regional tourism revenues.

Next Steps

- **The examination of the economic impacts that the railroad has on the counties of Humboldt, Mendocino and Sonoma:** Based purely on the cash flow of the NWP, the railroad will have a difficult time supporting itself. If the economic impact of the railroad is considered in the equation, there may be a greater justification for the subsidy of the line depending on its regional contribution. The PB Team has been authorized to conduct such a study and anticipates finishing this evaluation in the next six weeks.
- **The integration of financial feasibility study with the capital plan into a full financial analysis:** The next step would be to analyze the relationship of capital investment and other past commitments, to this financial feasibility study. The Return on Investment (ROI) and Net Present Value could be calculated for the railroad. These common business indicators would be very useful for understanding

the relationship between the capital investment and the cash flow forecast and would give a complete picture of the long term prospects of the railroad.

- ***New market exploration.*** Key to the NWP's success is the development of new markets. As was mentioned above, the Port of Humboldt Bay is going to be examined under this study. However, aggregates, solid waste, nuclear waste and national security opportunities should be studied in further detail. Such a review would help the NCRA and the State more accurately forecast the timing and revenue potential of these crucial commodities.