1.011 PROJECT EVALUATION

SPRINTER

OCEANSIDE-ESCONDIDO RAIL PROJECT
NORTH SAN DIEGO COUNTY TRANSIT DISTRICT

Above: Rendering of Example Station
Right: DMU Train
Bottom: Cal-State San Marcos Station

JOHN R. VELASCO
UNDERGRADUATE
SPRING 2003
EXECUTIVE SUMMARY

A Brief Project History

State Route (SR) 78 is one of the most heavily traveled freeways in San Diego County. Despite recent improvements, it exceeded capacity by the year 2000 and will continue to experience significant increases in traffic demand in the coming decades. For a period of 15 years, there have been a number of transportation studies specifically to identify feasible and cost-effective solutions to the growing transportation needs of northern San Diego County along the SR-78 corridor. Participants in these studies have included SANDAG (San Diego Association of Governments), Caltrans, NCTC (North County Transit District), and the jurisdictions of Oceanside, Carlsbad, Vista, San Marcos, Escondido, and the County of San Diego.

The study recommended a multimodal approach which includes the provision of passenger rail service over the existing railway right-of-way (ROW), highway improvements, and subregional arterial network improvements. A 1987 study conducted by SANDAG that included a detailed analysis of transit alternatives recommended DMU (diesel multiple-unit) as the preferred rail technology for the SR-78 corridor. In 1987, Proposition A was passed by San Diego voters authorizing the establishment of TRANSNET Funds for local transportation projects which included the Oceanside–Escondido Rail Project.

The Oceanside–Escondido Rail Project has a number of objectives it aims to fulfill:
- provide an alternative mode of transportation to the automobile in the SR-78 corridor;
- alleviate the traffic along this crucial corridor between the coastal and inland North County;
- satisfy the public mandate, expressed in voter approval of Proposition A in 1987 to finance significant transportation improvements;
- provide an efficient non-automobile linkage to some of the area’s key destinations and employment centers;
- reduce auto-related air emissions, thereby contributing to the improvement of regional air quality; and
- support local land use efforts to revitalize underutilized areas and to assist in the growth of targeted development areas.

To meet these goals, the proposed project consists of improving 22 miles of existing railroad ROW between the Oceanside and Escondido Transit Centers and adding 1.7 miles of new rail to Cal-State University San Marcos thereby establishing a complete new passenger rail system including new vehicles, stations, a maintenance facility, and ROW improvements.

**Analysis**

In analyzing the Oceanside-Escondido Rail Project, I reviewed the major issues of transit congestion that plague the region, as well as several alternatives to solving the problems of congestion and continuing growth. In analyzing each alternative, I briefly examine the costs and benefits. In covering these different alternatives I will approach the discussion in a qualitative manner, as specific numbers for the alternatives (in terms of costs and benefits) were difficult to obtain.

I have also covered the proposed alternative with more in depth discussion, with financial analyses, the costs and benefits both in qualitative and as well as quantitative terms. Additionally, the uncertainties of the project will be considered and a scenarios dealing with uncertainty will be presented. Analysis of how the projects costs and benefits might change given this scenario will also be conducted.

**Recommendation**

My recommendation to the parties involved (NCTD, Caltrans, SANDAG, and local governments) will be to proceed with the project as planned. The current proposal, as it stands, is the most economically feasible and sustainable alternative. The costs of the No-Action Alternative are too high—as the population of North San Diego County is expected to grow 74.5 % from 1990 (447,048) to 2015 (780,082)—based on current projections (US Census 2000). As population grows, the demand for housing, jobs, and alternative modes of transportation will continue to grow.

SR-78 has reached full-capacity and it is neither financially nor physically possible to expand it from 6 to 8 lanes as it would require the reconstruction of numerous bridges and the displacement of a large number of North County residents and businesses.

Therefore I recommend the project based not only on the demonstrated need, but also on the low costs (per mile of construction) and the numerous benefits such as decreased congestion and emissions, that it will bring to the region in the years to come.
Background

History
The Oceanside–Escondido Rail Project includes approximately 15 stations serving the 22-mile alignment along existing right-of-way that NCTD purchased in 1990 for $43.4 million dollars.

According to a survey conducted by NCTD, 78% of North County residents believe that traffic on SR-78 is a major issue. SR-78 is a heavily-traveled corridor with moderate to severe congestion with 145,000 vehicle trips/day. With the estimated 74% increase in population from 1990 to 2015, it is likely that traffic will continue to be a major issue along the corridor (US Census, 2000). A thorough listing of the reasons behind the need for the project is provided below, divided by the major project components: the main line and the Cal-State San Marcos Loop.
MAIN LINE

This portion of the project is along the existing NCTD owned ROW from Oceanside to Escondido.

Traffic Conditions:

SR-78 serves as the main east-west route in North San Diego County between Interstate 15 (I-15) and Interstate 5 (I-5). It is anchored by the two largest cities in the North County—Oceanside and Escondido. The nearest expressways that run parallel to SR-78 are SR-76, 15 miles to the north, and SR-56, yet to be completed, 15 miles to the south. The SR-78 corridor contains a mixture of different zones ranging from residential to commercial, industrial, and educational with Cal-State San Marcos and Palomar College.

Despite the widening of the corridor from 4 to 6 lanes nearly a decade ago, it reached capacity by the year 2000; congestion continues to occur on a daily basis. The California Department of Transportation (CalTrans) has said in its evaluation of the corridor that it may be economically infeasible to expand the highway to 8-lanes due to ROW (right-of-way) constraints.

Although Caltrans has plans to improve SR-78 that including upgrading interchanges, ramp metering, and adding auxiliary lanes, forecasts still indicate increases in traffic in the years to come. These increases are attributed to the local street networks which are inadequate for short intraregional trips, forcing those who might usually take surface streets to have to use the freeway for shorter trips.

Growth

SANDAG currently identifies northern San Diego County as one of the fastest growing areas in California as families are flocking to Southern California for its beautiful year-round weather and job opportunities. The population along the SR-78 corridor alone is expected to grow by 74.5% from 1990 to 2015—an increase of over 300,000 people, which greatly exceeds the current projections for the rest of San Diego county at 45% (Census 2000).
This large increase in population creates a demand for additional housing. The number of housing units along the SR-78 corridor is expected to grow from 175,781 units in 1990 to 293,060 units in 2015—growing 40%. Despite slow economic growth in San Diego, the employment growth in the cities along the corridor is expected to increase by a total of 58.6% from 165,725 jobs in 1990 to a total of 262,869 jobs by 2015. The employment growth rate in this corridor is over twice that of the San Diego region (SANDAG).

**Increasing Demand**

The strongest trip demand from the communities of the North County is for coastal and inland access, which SR-78 provides. Travel along the SR-78/Palomar Airport Road (which runs parallel to SR-78) corridor between the coastal and inland areas produces the second largest travel corridor in the region, and according to SANDAG, it will host 93,359 “person-trip travel movements” between corridor jurisdictions per day—an increase of nearly 84% from 1990.

(Note: A person-trip movement is defined as a trip in which a person moves over 2 miles along this corridor).

**CALIFORNIA STATE UNIVERSITY SAN MARCOS LOOP**

Cal State San Marcos is in desperate need of an alternate mode of transportation to the campus due to projected enrollment growth and limited arterial access. Currently at 8,000 students, faculty and staff, it is expected to grow to around 18,000 (based on full-time enrollment even though some students attend part-time) by 2020 (Cal-State San Marcos). The actual number of persons going to and from campus on a daily basis is likely to be 45,000-50,000, according to university projections. CSU San Marcos included in their EIR (Environmental Impact Report) a mandate requiring some form of nonautomobile transportation to mitigate the intense traffic impact that will be placed on the surrounding area.
ALTERNATIVES

In the transit studies that were conducted by SANDAG in collaboration with NCTD and other local and federal agencies, there were a number of alternatives considered. These alternatives included the expansion of the express bus system that runs through the corridor, a trolley light-rail system, an automated guideway transit system (e.g., monorail), or the no-action alternative.

EXPANDED BUS SYSTEM

This alternative consists of an intensified Oceanside to Escondido bus service by expanding the current express route to serve five existing major transit centers (Oceanside Transit Center, Vista Transit Center, Palomar College, North County Fair, and Escondido Transit Center). Expansion of the current system would allow buses to run on 20-minute headway rather than the current 30 minute headway.

Expansion of the current Express Bus Service would be less expensive than the proposed commuter rail project. Initially the increased bus service would provide some mobility and accessibility benefits similar to the rail project. However, as traffic congestion continues to grow, the ability of the bus to maintain its travel speeds becomes increasingly difficult. The major disadvantage with an express bus service is that it is subject to the same congestion that plagues the automobiles in the travel corridor.

If demand were to increase significantly, another bus would have to be called into service and costs of operation would rise (to pay for additional vehicle, fuel, and operator). On the other hand, a rail system incurs less incremental costs, since it involves connecting another vehicle to the train. Additionally commuters would sit in the same traffic that affects them in their automobiles along
SR-78, and this would actually provide a disincentive for people to ride them. NCTD determined that an expanded bus service could increase bus ridership by one-third, from 2,270 average daily riders per day in 1996 to 3,600-4,000 average daily riders in 2005. Similarly, the rail project has an estimated ridership of 11,400 when it opens in 2005. Express bus lanes were considered to help solve this issue, but it was noted that these were not feasible along any significant stretch of SR-78 due to the severe congestion and limited available highway space. For these reasons the Expanded Express Bus service alternative was not considered a viable alternative.

RAIL SERVICE

A 1987 SANDAG study on the Highway 78 Corridor concluded that rail service in the corridor was feasible and that it would not be economically practicable to widen the existing highway to 8 lanes due to ROW constraints. The study recommended a multimodal approach which would optimize and utilize the existing SR-78 corridor infrastructure. This approach included recommendations for a passenger rail service running along the existing NCTD railway, a number of highway enhancements, as well as subregional arterial network improvements.

In a 1992 study SANDAG evaluated a series of alternative rail technologies through the Future Transit Corridor Evaluation. The study reviewed three technologies for the Oceanside-Escondido corridor which included light rail (trolley), automated guideway vehicles (monorail), and DMU vehicles.

The light rail alternative was considered less desirable than DMU because of the high capital costs, overhead catenary, operations costs (for electricity) and limited grades (4%). NCTD found that there was no significant trip-time advantages for electrical vehicles and that efficiency in terms of energy use and operation could not
be achieved using this technology due to the regions variable topography and the number of multiple stops along the route.

The automated guideway transit system or monorail was considered less cost effective because of the high capital construction costs for the track system and the operating costs. It was also unfavorable because of the greater environmental impact—it was considered less visually appealing. Monorail was also considered for the San Marcos Loop of the project, but was determined to be infeasible when considering the higher operating and maintenance costs in comparison to DMU technology.

DMU technology, on the other hand, was favored because of its low maintenance costs and its ability to use the existing railway without the addition of overhead catenary. In addition each car is capable of holding 75 passengers, is bi-directional, self-propelled, and capable of operating in a single or multi-unit configuration. SANDAG, in the 1992 study, concluded DMU technology was the most efficient for the Oceanside-Escondido Rail Project.

**NO ACTION ALTERNATIVE**

The no action alternative consists of existing plus committed roadway improvements and existing transit services for the project area. There are a series of planned upgrades to the SR-78 corridor including upgraded interchanges, ramp metering, and the addition of auxiliary lanes. It was determined that the no-action alternative was not feasible for two primary reasons:
- SANDAG predicts a significant increase in traffic congestion along the corridor despite planned upgrades.

- The no action alternative is inconsistent with NCTD’s Short Range Transit Plan, which calls for a rail corridor and anticipates the project to be in operation beginning in 2005.

Below: A rendering of the proposed Cal-State San Marcos Station—a part of the San Marcos Loop (Source: NCTD)
Risks & Uncertainties

It is impossible to explore all of the factors that affect uncertainty and risk—however, I will consider four of the most common, found in almost all projects, and then I will discuss the ways in which these problems were considered in the evaluation of the Oceanside–Escondido Rail Project.

1. The possible inaccuracy of the cash-flow estimates used in the study

If information regarding the items of revenue and expense are available, the resulting accuracy of cash flow estimates tends to be good. NCTD addressed this issue by using other commuter rail lines in the San Diego County region as models. NCTD also operates a north-south commuter line known as the Coaster which runs along the Interstate-5 corridor and attracts commuters from Downtown San Diego to Oceanside.

In addition to examining current lines, NCTD performed extensive regional studies concerning the development of the project area and population models for future years. In this analysis, they examined the current congestion along the SR-78 corridor and did projections for 20 years in the future. Through this careful analysis of the region, they were able to establish a solid base of riders that would increase on a yearly basis, which would provide sustainable, predictable revenue.

In considering the costs, NCTD took a number of careful steps to provide an accurate analysis. Again, they examined similar projects in the region (e.g. the Coaster line). From these projects they were able to gather estimates of the operating costs of such a line as well as the construction costs for stations and the relative costs of the DMU’s (engines & cars).

2. The type of business involved in relation to the future health of the economy

Some types of business operations are less stable than others during times of economic downturn. To examine this risk, NCTD evaluated the local economy.

San Diego is a military town—it has been since the Second World War. It is home to 3 US Navy Carrier battle groups, as well US Marines at Camp Pendleton and Marine Corps Air Station Miramar. In addition to the US Military personnel, San Diego is increasingly becoming a hotbed for the biotech industry, much like Cambridge. It also has a number of other important industries that make up its economy.

Due to its broad economic base, San Diego is growing at a rapid rate, it is one of the hottest real estate markets in the country, despite the troubled economy, and there are no signs of it slowing
down anytime soon. Therefore there is an increasing need for public transit routes to help decrease the ever-increasing congestion.

In their analysis NCTD included projections for population growth in the Oceanside/Escondido regions as well as projections for increasing traffic on the SR-78 highway, which runs parallel to the projected path of the Sprinter line. These numbers helped to support the sustainability of the project despite any type of economic turndown—San Diego is growing, and it will continue to grow.

3. Type of physical plant and equipment involved

Some types of structures and equipment have rather definite economic lives and market values. On the other hand, some do not. NCTD also took this into consideration in planning the Sprinter line. They examined the economics lives of the infrastructure—the rail, and of the engines—the DMU's. The rail, if maintained properly, has the potential to last for decades. NCTD actually purchased the existing right-of-way, and the project actually involves just constructing stations and an additional transit loop to facilitate turning around for the trains. The rail is also still used to transport freight in the evenings—therefore it serves two purposes.

The also reviewed the costs and lifetime of the engines. In selecting DMUs, NCTD hoped to pick a system that was easy to maintain, limited pollution, and did not require external power, hence a system that was self-propelled. The engines could be used on any rail line and therefore could be transferred to another project, if NCTD felt that the Sprinter line from Oceanside to Escondido—for some reason was not profitable. They could also be sold to other transit districts for use. The DMU's being self-contained and self-propelled could work on any rail line and therefore the risk of them being not useful outside of the Sprinter line is reduced.

This risk is tied to the possibility of the ridership not developing as expected. One way to mitigate this uncertainty is through the use of DMUs as they are transferable assets that can be sold.

4. The length of the period used in study analysis

The series of cash inflows and outflows relies heavily on the length of the study period. As the length of the period increases, all else being equal, the uncertainty of the capital investment also increases.

NCTD used a study period of 20 years—they ran all of their projections for population growth and traffic analyses out to 2015. This seems to be a reasonable study period given the uncertainty of the other factors such as the rate of population growth (which if you take the last 20 years 1980-2000 as an example—is very difficult to predict), and the demand for public transportation. These factors
cloud the ability of project evaluators to determine the long-term success of a project of this kind (long term being 30-50 years).

It is perhaps unreasonable to demand a study period beyond 20 years for a transit project of this sort, and it is unlikely that the estimates for any factor beyond this point will be reasonably accurate.

Below: A map of the proposed route for the Oceanside-Escondido Rail Project: the Sprinter

Source: NCTD
QUALITATIVE

NCTD has been careful in its design of the project and along the way has solicited public input through a series of town meetings. Out of these meetings have come a number of concerns. Below you will find a list of these concerns followed by a table describing the ways in which NCTD has planned to mitigate the impacts of the Oceanside-Escondido Rail Project.

Concerns

- possible traffic congestion and back-ups at grade crossings
- private property concern over noise, vibration, and safety on a shared (freight and commuter rail) rail line along the Cal State San Marcos Loop.
- private property concern about the coordination between the Cal State San Marcos Loop and the Woodland Parkway and Barham Drive projects in the Walnut Hills area.
- diesel fumes from the train in the Walnut Hills area of the Cal State San Marcos Loop.

Source: Environmental Assessment/Subsequent Environmental Impact Report for the Oceanside--Escondido Rail Project, NCTD, 1996.

Summary of impacts and mitigation measures for the Oceanside-Escondido Rail Project

(Note: This is a summary of the issues presented in the EIR)

<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Impact/Effect</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic/Transportation</td>
<td>Temporary traffic delays at grade crossings during construction</td>
<td>Prepare traffic control plan</td>
</tr>
<tr>
<td></td>
<td>Insufficient parking spaces at Oceanside Transit Center, El Camino Real, and College Boulevard Station.</td>
<td>Provide additional parking spaces by constructing an additional parking area (Oceanside Transit Center &amp; College Blvd Station) and allowing on-street parking (El Camino Real Station).</td>
</tr>
<tr>
<td>Visual Quality</td>
<td>The project would result in significant impact if sound attenuation techniques were not designed to be architecturally compatible with the surrounding setting</td>
<td>In design and construction—conform to each local jurisdictions design standards &amp; architectural design patterns</td>
</tr>
<tr>
<td></td>
<td>The required grading for the CSU San Marcos Loop will result in significant visual impact</td>
<td>Implement contour-grading techniques. Match surrounding slope contours and use retaining walls, where feasible</td>
</tr>
<tr>
<td>Geology</td>
<td>Impacts to the project as a result of strong ground shaking</td>
<td>Conduct testing of soil foundations to determine weaknesses in soil strength and design major structural elements to withstand collapse from a maximum credible earthquake in accordance w/ Caltrans standards. Require falsework on elevated segments and shoring on cut segments and excavation areas.</td>
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<tr>
<td></td>
<td>Granular alluvial soils below the water table at the maintenance facility have a potential for seismically induced liquefaction</td>
<td>Conduct more detailed geotechnical work where liquefaction may be possible. If soils subject liquefaction are found, incorporate conventional engineering solutions.</td>
</tr>
<tr>
<td></td>
<td>Soils along the alignment with slopes greater than 30% would be considered unstable. Portions of the project are located in an area of moderate to greater soil erosion and expansion potential.</td>
<td>Conduct further testing, formulate final design criteria, and incorporate criteria and standards into construction bid documents. Cut unstable slopes at an inclination no steeper than 2:1. Slopes in a nonrippable rock could be cut at 1:1 if there is no evidence of adverse rock decomposition, sorting, or groundwater seeps. Implement Best Management Practices such as watering disturbed areas, minimizing removal of native vegetation, and installing surface drainage systems.</td>
</tr>
<tr>
<td>Biological Impacts</td>
<td>The proposed project would affect sensitive biological resources as a result of construction and operational activities</td>
<td>Mitigate for direct loss of habitat through offsite preservation. Participate in the Oceanside Subarea Plan of the MHCP. Identify and map segments of the ROW that occur adjacent to sensitive resources. Educate construction crews regarding sensitive resources along the ROW. Avoid interruption of downstream flows where construction corridors cross streams. Restrict staging areas to ROW and station sites. Erosion and sedimentation control through use of silt fences, sandbags, etc.</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>The project would have the potential to directly impact five prehistoric archeological sites and Santa Fe railroad trestles and pre-1946 culverts</td>
<td>Prehistoric Sites: Comply with regulations regarding prehistoric sites. Test sites which have not already been tested for significance/importance. Avoid sites where possible or conduct a data recovery program. Historic Sites: Prepare a Historic American Building Survey/Historic American Engineering Record (HABS/HAER)</td>
</tr>
<tr>
<td><strong>Water Resources</strong></td>
<td>Flooding could affect several of the station parking lots because proposed parking lots would be below the 100-year flood elevations.</td>
<td>Design drainage structures for each proposed component in accordance with the recommendations of site-specific drainage studies by a Registered Professional Engineer.</td>
</tr>
<tr>
<td>Water quality impacts resulting from sedimentation and urban runoff associated with the stations, ROW, and Maintenance Facility are significant since runoff may potentially contain contaminants that could degrade surface water quality</td>
<td>Implement Best Management Practices to control runoff (e.g. drainage channels will be unlined wherever feasible to allow infiltration of site-related runoff and construct energy dissipaters wherever necessary to maintain nonerosive flow velocities)</td>
<td></td>
</tr>
<tr>
<td><strong>Public Health &amp; Safety</strong></td>
<td>Potential soil contamination at the Coast Highway Station and the Maintenance Facility from past and current use of hazardous materials onsite and the immediate surrounding area.</td>
<td>Collect soil samples from sites. Analyze the samples and if contamination is found anywhere along the project alignment, appropriate remedial/cleanup actions will be taken before construction resumes.</td>
</tr>
<tr>
<td><strong>Socioeconomics</strong></td>
<td>The project will require the displacement of a commercial/light industrial facility on NCTD-owned property.</td>
<td>In accordance with state and federal regulations the displaced owner will be provided with relocation compensation.</td>
</tr>
</tbody>
</table>

Note: the above costs and mitigation measures are given in qualitative terms.
Baseline Cost Estimate

Following is the current baseline cost estimate for the Oceanside-Escondido Rail Project. In addition to providing the costs I will speculate how the costs will change given one scenario that is based on the risks and uncertainties discussed previously, however this discussion will assign costs to these uncertainties and risks.

<table>
<thead>
<tr>
<th>Contract Units</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Unit 01 - Mainline Transit Way Construction</td>
<td>$161,600,000</td>
</tr>
<tr>
<td>Contract Unit 02 - Maintenance Facility</td>
<td>$9,726,900</td>
</tr>
<tr>
<td>Contract Unit 03 - San Marcos Loop Transit Way Construction</td>
<td>$20,309,800</td>
</tr>
<tr>
<td>Contract Unit 04 - Rolling Stock Procurement</td>
<td>$40,680,600</td>
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<tr>
<td>Contract Unit 05 - Fare Collection Equipment</td>
<td>$5,955,700</td>
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<tr>
<td>Contract Unit 06 - Project Administration</td>
<td>$2,344,800</td>
</tr>
<tr>
<td>Contact Unit 07 - OCIP</td>
<td>$3,865,500</td>
</tr>
<tr>
<td>Contact Unit 08 - Const Mgmt, Testing, Start-Up &amp; Community Relations</td>
<td>$18,733,300</td>
</tr>
<tr>
<td>Contact Unit 09 - Environmental Analysis &amp; Design Support During Construction</td>
<td>$4,980,900</td>
</tr>
<tr>
<td>Contact Unit 10 - Final Engineering</td>
<td>$11,530,200</td>
</tr>
<tr>
<td>Contact Unit 11 - Prior Property Acquisition (up to FY '02)</td>
<td>$43,400,000</td>
</tr>
<tr>
<td>Contact Unit 12 - Property Acquisition, Permitting, Mitigation &amp; Utilities</td>
<td>$12,397,400</td>
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<tr>
<td>Contract Unit 13 - Project Contingency</td>
<td>$16,428,300</td>
</tr>
<tr>
<td><strong>BASELINE COST ESTIMATE</strong></td>
<td><strong>$351,953,400</strong></td>
</tr>
</tbody>
</table>

Source: NCTD
Scenario: Actual Ridership Falls Short of Projections

In this scenario the actual ridership in the first five years is less than what was projected. Rather than 11,000 as projected it turns out to be around 8,000 in the first year slowly increasing throughout the first five years. This is due in part to a poor economic environment and a decrease in jobs in the region.

Below you will find the projected and actual (speculated) ridership for the first five years.

![Daily Projected vs. Actual Ridership (2005-2009)](image)

Given these numbers it is obvious that the cash flows will change and the Net Present Value of the project would decrease. It is possible to calculate how the daily and the yearly revenues will change.
### 1.011 Project Evaluation
Professor Carl Martland
John R. Velasco
Spring, 2003

<table>
<thead>
<tr>
<th>Fare/person/trip</th>
<th>$1.50</th>
<th>$1.50</th>
<th>$1.50</th>
<th>$1.50</th>
<th>$1.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Daily Riders</td>
<td>11,000</td>
<td>12,000</td>
<td>12,450</td>
<td>13,120</td>
<td>14,000</td>
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<tr>
<td>Total Daily Revenue</td>
<td>$16,500</td>
<td>$18,000</td>
<td>$18,675</td>
<td>$19,680</td>
<td>$21,000</td>
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<tr>
<td>Total Yearly Revenue ($Millions)</td>
<td>$6.02</td>
<td>$6.57</td>
<td>$6.82</td>
<td>$7.18</td>
<td>$7.67</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Fare/person/trip</th>
<th>$1.50</th>
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<th>$1.50</th>
<th>$1.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Daily Riders</td>
<td>8,000</td>
<td>8,700</td>
<td>9,400</td>
<td>10,000</td>
<td>10,800</td>
</tr>
<tr>
<td>Total Daily Revenue</td>
<td>$12,000</td>
<td>$13,050</td>
<td>$14,100</td>
<td>$15,000</td>
<td>$16,200</td>
</tr>
<tr>
<td>Total Yearly Revenue ($Millions)</td>
<td>$4.38</td>
<td>$4.76</td>
<td>$5.15</td>
<td>$5.48</td>
<td>$5.91</td>
</tr>
</tbody>
</table>

| Change in Yearly Revenue ($ Millions) | ($1.64) | ($1.81) | ($1.67) | ($1.71) | ($1.75) |

Given this 25–30% decrease in the actual from the projected ridership and the loss of revenue, it is necessary to determine if the project is still worthwhile. In order to do this we must look at the costs in perspective of the other factors that influence the project.

For one the annual operating/maintenance costs for the Oceanside–Escondido Rail Project are expected to be on the order of $12-13 Million dollars. If the ridership projections do not pan out the way they were expected to, as in the scenario above, the fare box recovery rate—the amount of annual operating expenses a transit system is expected to derive from its fare—will decrease, in this case from 45% to 30%. With this in mind, let us examine the other factors that affect our decision in a project such as this.

No transit project ever makes a profit—they are built at the public’s expense for the benefit of the public and are intended to be provided at a reasonable cost, which is normally well below the actual costs. For this reason, despite the decrease in ridership I would still recommend the project because even though they do not meet the projections in the short term it doesn't mean that they can't meet and exceed those projected in years to come.

Additionally this project is justified because of the benefit it provides to the community and the region, benefits which are difficult to quantify, but which nevertheless increase the quality of life in the region by decreasing congestion and providing an alternative to automobiles.
Benefits

There are many benefits of the Oceanside-Escondido Rail Project. Some of the largest benefits are as follows:

- Improved air quality with a predicted 30% reduction in vehicle emissions
- Increased travel capacity in the corridor
- Increased mobility for North County residents with links to many other major regional transit systems
- The addition of jobs during construction and for operation/maintenance of the new system
- Service to Cal-State San Marcos, Palomar College, and Mira Costa College students

The project also has the potential to draw riders for a variety of different reasons as shown in the bar graph below.

![Bar Graph]

Source: NCTD

Given the variety of benefits that the project has and given the need for an alternative to SR-78 it is clear why the Oceanside-Escondido has continued to receive full public and local government support.
Conclusions & recommendations

There are a number of factors that have influenced my final decision on this project. These factors include:

- Assessed need
- Impacts on region and environment
- Costs & Alternatives
- Risks & Uncertainties
- Benefits

Given that with the current rate of growth North San Diego County will continue to grow and to congestion that is already severe will only increase and;

Given that the project will have a number of positive impacts on the community by providing a local means of transportation and a connection to other major railways and;

Given that the costs for this project are low when examined on a national level ($16.1/mile) and that the alternatives are not feasible because of ROW constrictions or financial constraints and;

Given that the risks and uncertainties that do exist do not sufficiently hamper the ability of the project to be profitable in the long run given the expected growth and;

Given that the region would benefit greatly from an alternative form of transportation, much in the same ways Downtown San Diego and Oceanside have benefited from the Coaster commuter line;

I hereby highly recommend this project and urge transportation officials nationwide to examine this project as a model of the types of collaboration and careful planning that must go into any good, worthwhile, and successful transit project.
REFERENCES

