A Postmortem Analysis of the Los Angeles County Metropolitan Transportation Authority's 20-Year Long-Range Plan

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A POSTMORTEM ANALYSIS OF THE LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY’S 20-YEAR LONG-RANGE PLAN

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After spending or committing almost $7 billion on light and heavy rail lines, the Board of the Los Angeles County Metropolitan Transportation Authority (MTA) has voted to suspend most rail construction. This is an analysis of the current MTA long-range 20-year plan, “A PLAN FOR LOS ANGELES COUNTY: Transportation for the 21st Century,” adopted March 1995. The plan is inconsistent with federal planning requirements. Performance indicators described in the plan are skewed in favor of rail in part because the plan accounts only for local costs in cost-effectiveness calculations. The plan does not evaluate reasonable alternatives to rail lines, avoiding discussion of lower cost options. We conclude that the Los Angeles rail plan was never realistic. The plan was crafted to justify the decision to build the Los Angeles rail system and not to guide, inform, or improve this decision.

In March and April of 1992, the Los Angeles County Transportation Commission (LACTC) adopted a 30-year plan for transportation in Los Angeles County. The 30-year plan called for spending $187 billion and constructing 36 rail lines or rail segments (LACTC, 1992a, pp. 37-50). The Los Angeles County Metropolitan Transportation Authority (MTA) was created early in 1993 following the merger of the Southern California Rapid Transit District (SCRTD) with the LACTC (Moore, 1993). LACTC’s 30-year plan was repudiated by the new agency’s chief executive officer, Franklin White, who was subsequently removed by the MTA board. Under White, the MTA began formulating a new long-range plan to replace the previous program. The long-range plan process culminated in the adoption of the MTA’s long-range 20-year plan, “A PLAN FOR LOS ANGELES COUNTY: Transportation for the 21st Century,” in 1995 at the MTA board’s March and April meetings. This new plan was considerably less optimistic than LACTC’s predecessor document but retained a substantial rail component, including completion of five new subway lines in the plan’s first decade.

AUTHORS’ NOTE: This work was supported by a grant from the Reason Foundation. We appreciate the materials and discussion provided by Robert Poole and Kenneth Green, both of the Reason Foundation. We remain responsible for conclusions presented here. Please address correspondence to James E. Moore, II, Associate Professor, Department of Civil Engineering, University of Southern California, Los Angeles, CA 90089-0626; phone: (213) 743-2090; fax: (213) 743-2476; e-mail: jmoore@rcf.usc.edu.

On January 14, 1998, in an action that may mark the end of rail construction in Los Angeles, the MTA board suspended work on three rail lines, one of which (the Pasadena Blue Line) was already in an advanced state of construction, to complete work on two subway lines currently under construction (LACMTA, 1998c). The three dissenting votes in the 10 to 3 action felt that the 6-month suspension did not go far enough. The dissenters wanted to terminate subway construction altogether (Bloom, 1998; Simon, 1998).

We estimate that Los Angeles has spent or committed to spend almost $7 billion on rail construction and is currently carrying another $3.66 billion in debt (LACMTA, 1997, pp. 22-23)—most of it bonds. Suspending such an expensive effort provides a compelling incentive to revisit the details of the plan. We do not mean that failure of a project is not equivalent to a planning failure. Decisions and outcomes are distinct. A good decision cannot ensure a good outcome, just as a bad outcome does not automatically imply a bad decision. A good decision is consistent and rational with respect to the decision maker’s risk tolerance, opportunity costs, and state of information. But there are uncertainties in any implementation process, and large, well-planned, thoroughly rational efforts are sometimes going to fail.

A good plan can do no more than increase the likelihood of a good outcome, especially in a political environment. Project decisions might still be made unscientifically even if a good plan is available to inform decision makers. However, not all decisions are engendered by formal plans. Some plans are constructed after the fact to rationalize and justify decisions made for other reasons. If this is the case, examining the plan provides insight into the decision it is intended to justify.

We review and evaluate the MTA’s plan to better understand the quality of the decisions that led to its adoption and, by extension, the quality of the decisions committing Los Angeles County to development of its rail system. We do not believe that the plan has caused the Los Angeles rail project to fail. The situation is not this simple. The plan is merely a symptom. We do not believe the plan is intended to be a framework that codifies and compares a set of alternatives expressed with the intention of informing, supporting, and better enabling the decision to build or not to build the Los Angeles rail system. We argue that it is a less objective document intended to justify a decision that has already been made.

The MTA tells us otherwise. In public meetings and presentations, the MTA staff and board members have consistently treated the plan as an analytical exercise demonstrating Los Angeles’s need for rail investments and the merits of proceeding with construction of the rail system. For the sake of argument, we have taken them at their word. We examine the plan under the assumption that it was intended to be taken seriously and to provide a systematic rationale for choice and action. If the plan bears up under this examination, then it may be that the Los Angeles rail system has failed for nontechnical, possibly unforeseen reasons that exist outside the plan. The rationale for the system would remain intact; this rationale would likely prove central to overcoming whatever barriers exist. If the plan fails our test, then terminating construction of the system may have been the best outcome. Other questions would then become relevant. If the plan is deficient, has the decision to build or not to build been sufficiently well informed? Would an adequate plan suggest proceeding with construction? If no amount of analysis justifies building the Los Angeles rail system, why did the decision makers who wanted to build it want to do so?

Our criteria for good transit investment decisions are simple. Most public transit services are provided as a form of wealth transfer, ensuring as many residents as possible with at least a minimum level of mobility. Transit agencies are sometimes asked to configure services that might reduce congestion or improve air quality by attracting riders who might otherwise choose private vehicles. There is a tension between these two objectives that most transit agencies do not know how to resolve. We consider either objective acceptable, recognizing that there is a trade-off. Regardless of which outcome the trade-off favors, providing cost-effective service remains of paramount importance. Maintaining good cost-effectiveness means either more service and more benefits from the wealth transfers necessary to provide the service or higher quality service and fewer travelers electing the automobile. Cost-effectiveness is not a sufficient condition to ensure good transit investment decisions, but we contend it is a necessary condition.
Thus, we treat the MTA’s plan as a business plan, examining its recommendations in light of the data, assumptions, and models it includes. The following section is a summary of the plan recommendations. The next section summarizes modeling procedures and results with respect to population forecasts, bus, and rail ridership forecasts, measures of effectiveness (MOE), and project comparisons in terms of these MOEs. The fourth and fifth sections discuss MTA cost and revenue assumptions, respectively, and the last section consists of conclusions and recommendations. Although we may appear to be operating with the advantage of hindsight, this is not the case. Most elements of our analysis predate the cessation of rail construction in Los Angeles. Reality now conforms to our forecasts (Rubin & Moore, 1996a, 1996b, 1997).

Summary of Plan Recommendations

The MTA allocates at least 37.8% of the $72,476.5 million long-range plan budget to rail projects, more than any other element. Figure 1 summarizes allocations. Bus service receives the second largest allocation in the plan with a 35.3% share. Highway and multimodal capital investments receive an allocation of approximately 17.1% of total funding. Of this, 4.4% of the total plan budget is allocated to highly rated Regional Surface Transportation Improvement (RSTI), Transportation Demand Management (TDM), and Transportation System Management (TSM) projects. The budget for local return funds to municipalities is 7.4% of the total.

The plan assumes completion of Red Line subway Segments 2 (A and B) and 3 (North, Mid-City, and Eastside). Red Line Segments 1 and 2A are in operation. Segment 2B is almost ready for service; 3 North is under construction. The plan (LACMTA, 1995b, p. 7) also recommends completing light rail lines under construction at the time the plan was adopted (the Metro Green and Pasadena Blue Lines), initiating construction of the following three new subway lines (LACMTA, 1995b, p. 42):

1. San Fernando Valley East-West to 405 freeway (Board Mandate),
2. Red Line Western Extension to 405 freeway, and
3. Red Line Eastern Extension to Atlantic,

and beginning six additional projects during the plan’s second decade (LACMTA, 1995b, p. 42):

- Crenshaw Corridor,
- Downtown Connector,
- Exposition Line (Downtown to University of Southern California),
- Glendale/Burbank Line,
- San Fernando Valley East-West (405 freeway to Warner Center), and
- 10/60 Corridor.

However, construction of these six projects was dependent upon “should funds become available.” At the present time, it appears more likely that there will not be funds available for the three new subway lines above that were “approved,” let alone some of the projects that were regarded as approved and “funded” prior to the commencement of the long-range planning process. The San Fernando Valley East-West extension to Warner Center is a subway. The remaining five projects are light rail lines.

The plan compares predictions for three scenarios to 1990 conditions to baseline predictions for the year 2015 (LACMTA, 1995b, p. 20) and recommends Scenario 1. These scenarios are summarized in Table 1. The plan’s precursor documents also include a description of an improved 2015 baseline (LACMTA, 1994d, pp. 6, 8). The plan scores rail lines, high occupancy vehicle (HOV) lanes, and several other types of projects on MTA criteria but does not score bus
Figure 1: Los Angeles County Metropolitan Transportation Authority Long-Range Plan Rail Costs
NOTE: This is a conservative estimate of the rail share. The large majority of financing payments will be for rail projects, but not all. This is more than offset by rail costs in other categories not listed above, including Union Station Gateway Transit Center ($149.6 million), Park and Ride/Transit Centers/DMU/Other ($363.8 million), Transportation Enhancements ($301.8 million), Reserve Fund ($720.5 million), Local Return ($5,398.1 million), and Administrative Overhead ($983.6 million). Bus revenues cover about one third ($8,529.6 million) of bus operating costs. Rail revenues cover a little more than 5% ($1,440.8 million) of rail costs. The rail share of public sector subsidies is thus 41.5%.

service. Expansion of bus service is not considered. Consequently, the plan includes no substantive discussion of busways, bus malls, bus priority/preference signaling, or related options.

Summary of MTA Modeling Procedures and Results

POPULATION FORECASTS

The plan (LACMTA, 1995b) states that “Los Angeles County population will increase by almost 3 million people by the year 2015,” and that

without improvements to our current transportation system or changes in the behavior of the traveling public, the projected increase in population and employment would reduce average countywide morning peak period speeds from a current level of 30 to 40 miles per hour to 15 miles per hour or, in some rapidly growing outlying areas, to less than 10 miles per hour. (p. 4)

This is a population increase of 33.4% for the period 1990 to 2015 (LACMTA, 1995b, p. 19).

Neither we nor the authors of the plan believe this will occur. Residents of Los Angeles would change their travel behavior in response to such dramatic changes in travel speeds. The greater the change in travel speed, the more pronounced the change in behavior. This is
Table 1: Summary of Los Angeles County Metropolitan Transportation Authority (LACMTA) Long-Range Planning Scenarios

<table>
<thead>
<tr>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared rail segments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Line subway segments 1, 2 (almost complete), and 3 (North is under</td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Line light rail (Long Beach–Los Angeles, complete)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Line light rail (Pasadena–Los Angeles, under construction)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Line light rail (complete)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Fernando Valley Line subway (not yet begun)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metrolink Commuter Rail (full eight line system)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other rail segments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Line Subway East,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red Line Subway West</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional buses relative to the unimproved 2015 baseline</td>
<td>300</td>
<td>627</td>
</tr>
<tr>
<td></td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Shared HOV lanes</td>
<td>16 segments</td>
<td>16 segments</td>
</tr>
<tr>
<td>Other HOV lanes</td>
<td>Interstate-5 between Route 134 and Interstate-10</td>
<td>None</td>
</tr>
<tr>
<td>Projected daily transit ridership (work trips only)</td>
<td>631,167</td>
<td>606,278</td>
</tr>
<tr>
<td></td>
<td></td>
<td>616,099</td>
</tr>
</tbody>
</table>

NOTE: HOV = high occupancy vehicle.

acknowledged in the plan: "The projected demographic growth is unlikely to occur if the Baseline Scenario transportation deficiencies become reality. . . . Many areas lack the infrastructure to accommodate the projected growth" (LACMTA, 1995b, p. 34).

MTA staff maintains that federal law requires the MTA to base its plans on the population projections of Los Angeles' Metropolitan Planning Organization (MPO), the Southern California Association of Governments (SCAG). We are unable to verify the existence of this requirement in any statute. The Federal Transit Administration's (FTA) Washington headquarters' planning staff also purports to be unaware of this requirement.

MTA does not use the SCAG forecast as a basis for its estimate of sales tax revenues. It uses the University of California, Los Angeles (UCLA) Business Forecasting Project Long Term Forecast. The August 1994 forecast (UCLA, 1994, p. B17) shows a 2015 Los Angeles County population of 10,522,300, compared to the SCAG projection of 11,819,655 (LACMTA, 1995b, p. 19). It is not clear how to reconcile the MTA's use of these different population forecasts for travel demand and sales tax estimates. This is the most important of several significant differences between the assumptions underlying the MTA's transportation and financial planning models.

BUS RIDERSHIP FORECASTS

The MTA exercises a version of the Urban Transportation Planning System (UTPS) to provide predictions for each scenario, including the baseline. UTPS is a set of large, numerical models developed more than two decades ago by the U.S. Department of Transportation (USDOT). Unfortunately, results for MTA's baseline and improved baseline scenarios are internally inconsistent when compared to each other and to data for 1990.

It is not clear how to reconcile the MTA's use of different population forecasts for travel demand and sales tax estimates.
The plan reports,

With the increased congestion on arterial streets, bus transit speed will be severely reduced, making transit a less desirable means of travel. . . . If this trend continues, average MTA system wide speed will be under 10 mph by the Year 2015. (LACMTA, 1995b, p. 29)

Buses usually operate on arterial streets where they compete with cars. The plan reports a bus line average speed of 12.2 mph in 1990. This is 46% of the arterial lane average speed of 26.7 mph. In the 2015 baseline projection, average speeds for bus lines and arterial lanes are both 10.8 mph. If automobile and bus speeds both decrease so precipitously to the same value, this would not make bus transit a less desirable mode. It would make the bus option far more attractive relative to the automobile than it was before.

Comparing scenarios reveals great variation in the projected productivity of additional buses. In some cases, the MTA’s results imply that adding buses reduces transit work trips. For example, comparing Scenarios 1 and 3 suggests that the additional 200 buses assumed under Scenario 3 reduce transit work trips by 9,627 per workday. The MTA argues that the decrease in transit work trips under Scenario 3 is caused by slower bus speeds. Yet, relative bus speeds are actually 7.8% higher under Scenario 3 than are predicted under Scenario 1. This should induce a shift toward transit in Scenario 3 relative to Scenario 1 rather than away from transit. Similar inconsistencies appear if Scenario 1 is compared to Scenario 2 or if Scenario 2 and the improved 2015 baseline are compared relative to the unimproved 2015 baseline.

Attempts to reconcile these inconsistencies produce very unusual results. For example, the increases in average transit speeds predicted for Scenario 1 imply very unrealistic mode shifts. We impute from the speed, time, and other projections in the plan that about 72% of transit passenger miles traveled under the 2015 baseline must be made on bus and 28% on rail. Under Scenario 1, the imputed proportions are almost reversed, with 29% of passenger miles of transit travel being made by bus and 71% by rail. Such a massive shift in ridership from bus to rail service is very unrealistic for Los Angeles or for any other city in North America.

Scenario 1, the alternative recommended by MTA staff, proposes increasing the current Los Angeles County bus fleet of 2,950 by 440 peak buses (LACMTA, 1995b, pp. 49, 54), including the equivalent of 140 buses that will be redirected due to introduction of additional rail service. The MTA reports this increase as an improvement in bus transit service (LACMTA, 1995b, p. 6), but fleet size is only one component of service. At best, it is a rough surrogate for the amount of peak service operated. But off-peak service is also important in Los Angeles. For many years, the MTA/SCRTD has provided proportionally more off-peak service than almost any major bus system in the United States.

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The plan implies drastic reductions in this off-peak service. The November 18, 1994, plan documents report work trips and total trips for the plan’s 1990 baseline and improved 2015 baseline scenarios (LACMTA, 1994a, 1994b). The improved 2015 baseline and Scenario 1 both imply a substantial decrement in bus service. The improved baseline includes elimination of one quarter of the Los Angeles County bus hours and more than one third of the county bus miles operated in 1990. Off-peak revenue service hours will be reduced by almost half. Under the improved baseline option, total transit trips will drop by more than 6%, and transit use per capita will drop by 30%. This reduction in transit use is concentrated in nonwork trips, which decline by more than 30% due to a planned reduction in off-peak bus service of approximately half. For transit-dependent minority residents, this translates into a reduction in nonwork trips of 60% per capita (LACMTA, 1994b, pp. 5, 8; 1994c, p. III-A). These include trips to school, to seek work, to doctors, to shopping, and to visit friends and family. Subsequent plan documents show only work trips, eliminating any data that might be used to analyze total or nonwork Los Angeles County transit trips.

Under the improved baseline scenario, boardings per hour increase by 41% on a bus transit system that is already by far the most crowded of major U.S. urban bus operators (see Table 2). The 76 boardings per hour forecast under the improved baseline is a very high value. In 1992, the weighted average boardings per hour for the 20 largest bus transit operators in the nation was
Table 2: Projected Bus Performance Under the Los Angeles County Metropolitan Transportation Authority (MTA) Long-Range Planning Scenarios

<table>
<thead>
<tr>
<th></th>
<th>1990 System</th>
<th>Improved 2015 Baseline</th>
<th>Changes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantity</td>
<td>Quantity</td>
<td>Quantity</td>
<td>%</td>
</tr>
<tr>
<td>Bus system data</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak buses</td>
<td>2,333</td>
<td>2,471</td>
<td>138</td>
<td>+5.9</td>
</tr>
<tr>
<td>Annual boardings</td>
<td>453,242,445</td>
<td>484,043,994</td>
<td>30,801,549</td>
<td>+6.3</td>
</tr>
<tr>
<td>Annual revenue miles</td>
<td>107,781,596</td>
<td>71,029,582</td>
<td>-36,752,014</td>
<td>-34.1</td>
</tr>
<tr>
<td>Annual vehicle hours</td>
<td>8,435,040</td>
<td>6,367,591</td>
<td>-2,067,449</td>
<td>-24.5</td>
</tr>
<tr>
<td>Operating statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boardings per hour</td>
<td>54.0</td>
<td>76.0</td>
<td>22.0</td>
<td>+40.1</td>
</tr>
<tr>
<td>Average speed (mph)'</td>
<td>12.8</td>
<td>11.2</td>
<td>-1.6</td>
<td>-12.5</td>
</tr>
<tr>
<td>Hours per peak bus</td>
<td>3,616</td>
<td>2,577</td>
<td>-1,039</td>
<td>-28.7</td>
</tr>
<tr>
<td>Peak bus hours</td>
<td>3,555,492</td>
<td>3,765,804</td>
<td>210,312</td>
<td>+5.9</td>
</tr>
<tr>
<td>Off-peak bus hours</td>
<td>4,879,548</td>
<td>2,601,787</td>
<td>-2,277,761</td>
<td>-46.7</td>
</tr>
<tr>
<td>Peak/off-peak hours</td>
<td>42%/58%</td>
<td>59%/41%</td>
<td>+17%/-17%</td>
<td>40.4%/-29.3%</td>
</tr>
</tbody>
</table>

|                      | Quantity    | % of Total             | Quantity | % of Total |          |
| Trip statistics      |             |                        |         |            |          |
| Work trips           | 419,610     | 40.4                   | 554,384  | 56.8       | 137,774  | +32.1    |
| Nonwork trips        | 619,673     | 59.6                   | 422,162  | 43.2       | -197,511 | -31.8    |
| Total trips          | 1,039,283   | 100.0                  | 976,546  | 100.0      | -62,737  | -6.0     |

SOURCE: LACMTA (1994c, pp. 6, 8; 1995b, p. 49) and State of California (1994). Note: MTA does not report operating statistics such as revenue vehicle hours and miles, linked and unlinked passenger trips, passenger miles, and so forth, for its various scenarios. The annual bus operating statistics in this table are obtained from a preliminary MTA modeling exercise completed in early November 1994.

a. Revenue vehicle miles/revenue vehicle hours. This includes layover times at the ends of runs.

47.2. SCRTD/MTA reported the highest at 58.8. The highest systemwide average ever reported to the FTA's national transit database was 70.6 boardings per hour. This value was recorded by SCRTD in 1985 at the end of a 3-year period during which bus fares had been reduced to $.50. Although a few other operators have individual lines that average above 70 boardings per hour, none of the nation's 20 largest transit bus operators reported a systemwide average close to 70 since the end of World War II.

Scenario 1 adds 150 peak period buses relative to the improved 2015 baseline, which is an increase of 5%. There is no information provided on the quantity of service provided or the number of riders predicted. If these buses are operated 8 hours per day for 254 weekdays per year, bus revenue service hours would still be reduced by more than 20% relative to 1990.

Nonetheless, the plan indicates (LACMTA, 1995b, p. 84) that Scenario 1 provides a 26% improvement in mobility relative to the baseline scenario. Mobility is indexed by change in average travel speeds for Los Angeles County. Because Scenario 1 predicts lower transit ridership in 2015 than existed in fiscal year 1985, we conclude that the HOV lanes and other nontransit elements provide the majority of the improvement (LACMTA, 1994b, 1995d, p. 24; SCRTD, 1985).

MEASURES OF EFFECTIVENESS

The FTA is the principle federal grant funding agency for public transit projects. The FTA's requirements for the transportation planning process have not been finalized, but the agency has issued guidelines (FTA, 1994b, SCRTD, 1994) describing its current working standards. The FTA guidelines apply to all federally funded surface transportation programs (United States Code Annotated, Title 49, Sec. 5309 [m] [3]). The federal government, in general, will not fund new projects that are not evaluated using these measures.

The plan reports use of MTA's computer simulation model to "determine mobility, air quality, and cost-effectiveness contributions of the Baseline system, and each individual new project
and program, to projected year 2015 conditions” (LACMTA, 1995b, p. 5). In addition, “planning scenarios were analyzed to determine their mobility, air quality, and cost-effectiveness impacts along with their impacts on transit mode share” (LACMTA, 1995b, p. 5). The performance measures used by MTA to evaluate model outputs are interpretations of the proposed FTA factors. There are significant differences between the two sets of measures. The two sets of measures address similar concepts, but they are likely to produce very different results. These differences are probably unimportant, because it does not appear that either set of measures is used to establish staff recommendations put forth in the plan. The four quantitative MTA performance measures are the following:

- Mobility Index (change in the average speed of travel in the county),
- Air Quality Index (reduction in emissions),
- Mobility Cost-Effectiveness Index (the cost per unit of speed improvement), and
- Air Quality Cost-Effectiveness Index (the cost per unit of air quality improvement).

The formula for the MTA’s mobility index (LACMTA, 1995d, p. 8) is

\[
\text{Mobility Index} = \frac{\text{Person Miles of Travel} \times \text{Speed}}{\text{Vehicle Miles of Travel}}
\]

(1)

Dividing person miles of travel by vehicle miles of travel is an average passenger load. Thus, larger vehicles tend to increase this score. The effect is amplified in this case because the denominator excludes rail vehicle miles and may exclude bus vehicle miles. However, transit passenger miles are included in the numerator. This weights the score in favor of all types of transit and against street improvements and carpooling. \text{Speed} is the average speed over an entire trip, portal to portal, including waiting and transfer times. The plan states that this formula is applied to all Los Angeles County trips for all purposes—at all times and on all days.

The plan provides a single expression for a cost-effectiveness index (LACMTA, 1995d, p. 6),

\[
\text{Cost-Effectiveness Index} = \frac{\Delta S \text{ Capital} + \Delta S \text{ O&M} - \Delta S \text{ Non-MTA}}{\Delta \text{ User Benefits}}
\]

(2)

where

\[
\begin{align*}
\Delta S \text{ Capital} & = \text{change in annualized total capital costs;} \\
\Delta S \text{ O&M} & = \text{change in annual operating and maintenance costs;} \\
\Delta S \text{ Non-MTA} & = \text{change in annualized non-MTA funding (federal, state, municipal, and private contributions); and} \\
\Delta \text{ User Benefits} & = \text{change in hours of transit and HOV travel time savings, mobility index units, and air quality index units;}
\end{align*}
\]

but presents separate cost-effectiveness indices for mobility and air quality. Precursor documents (LACMTA, 1994d) show both MTA cost per new transit trip and full public cost per new transit trip, but the cost-effectiveness indices graphed in the plan appendix include only local costs. The negative sign before “$ Non-MTA” in Equation 2 indicates that the MTA attaches no cost to anything for which the agency does not pay. This violates both logic and federal standards. It does not matter whether local or nonlocal taxpayers generate the funds committed to a project: Cost is cost. We contend it is inappropriate and self-defeating for the agency to exclude federal, state, and local nonagency costs from local decision criteria, because local decisions will ultimately have to be explained to local, state, and federal partners.

Moreover, the MTA indices provide the agency with the means to arbitrarily determine the rankings of projects under consideration, because the MTA decides how the flexible federal funds it does not count will be applied to various capital projects. The agency also decides which
projects are worthy of presentation to the federal government in applications for discretionary federal funding.

COMPARING PROJECTS

The plan classifies transportation investment options into three categories. These are transit, including bus and rail projects; highway, the most important element of which is HOV lanes; and multimodal options, which consist mostly of interjurisdictional projects proposed by other local governments but funded by the MTA. The MTA scores rail transit, highway projects, and multimodal alternatives in terms of improvement to the Mobility Index, mobility cost effectiveness, improvement to the Air Quality Index, and air quality cost effectiveness. The plan does not score bus options because it presents no bus options.

We cannot replicate most of the index scores presented in the plan or in predecessor documents. In many cases, the data needed to perform calculations are not available from the plan or from supporting documents. The limited data provided do not reproduce the index values shown in the plan. Calculations involving important quantitative data are not shown. Graphs showing how projects score on MTA's decision criteria do not match the values shown in the narrative portions of the report, nor are these indices consistent with the inputs reported in the plan's precursor documents. Consequently, it is difficult to disassemble the MTA scores used to describe and compare the various projects. It does not appear that many key scenario elements were ever modeled at all. The plan documents are sparse with respect to details.

Mobility

Figure 2 summarizes the mobility impacts predicted by the MTA for the three classes of projects presented in the plan. The horizontal axis is the separate impact each project has on the Mobility Index. This increment is computed relative to the plan's 2015 improved baseline scenario. If no projects are implemented, the average countywide speed is projected to be 24.4 mph (LACMTA, 1995d, p. 27). The vertical axis is cost-effectiveness, which the plan reports conforms to Equation 2. Unfortunately, it does not appear to conform. Equation 2 includes all user benefits, but the plan treats time and air quality benefits separately. The formula expresses costs over benefits, whereas the graphs in the plan appendix express benefits over costs.

A subset of the highway/HOV projects score best in terms of both cost-effectiveness and mobility improvement. Transportation system management (TSM) projects also combine relatively high cost-effectiveness values with significant improvements in the Mobility Index. It is not clear if the moderate and high coordinates describe average or marginal values. Cost-effectiveness of marginal expenditures should be calculated using marginal improvements. Unfortunately, we cannot extend the analysis, because we cannot replicate the values presented in the plan.

The trade-off suggested by the three levels of transportation demand management (TDM) options is even more intriguing. Larger expenditures produce improvements in both mobility and cost-effectiveness. Spending $12 million on TDM produces a countywide average speed of approximately 25.08 mph. Spending $20 million delivers approximately 25.13 mph, and $40 million delivers approximately 25.42 mph. Thus, the return per unit invested is projected to increase with each new expenditure. If so, why stop at $40 million?

The regional surface transportation improvement (RSTI) trade-offs are similar to the TDM outcomes. Spending more produces better results more efficiently. The additional $15 million per year needed to shift from the RSTI-low option to the RSTI-high category increases countywide average speed by slightly more than 1.00 mph. The greatest increase available from any of the 14 rail projects identified in the plan is only about 0.30 mph. All 14 projects combined show an increase of about 1.95 mph. This summation provides only a rough comparison. The cumulative increment in the Mobility Index resulting from simultaneously implementing all 14 rail projects is certainly not equal to the sum of these 14 separate effects. However, the annual
operating cost of any one of these rail lines exceeds the additional $15 million per year needed to fund the RSTI-high category.

The total funding recommended in the plan for the TSM, TDM, and RSTI options does not conform exactly to the low, moderate, and high categories modeled in the plan. Accounting for inflation (LACMTA, 1995b, p. 114), the funding proposed for the RSTI and TDM options (LACMTA, 1995d, p. 50) is slightly lower than the moderate level. Funding for TSM options, which we define to include both local and freeway TSM expenditures, is approximately 21% above the high level.

The plan (LACMTA, 1995b, p. 13) reports that TSM is relatively cost-effective but that this effectiveness declines as more funds are allocated. This is correct, but the rate of decrease in TSM cost-effectiveness appears to be small. Furthermore, both the RSTI and TDM options exhibit increasing effectiveness as expenditures increase. The MTA's results strongly suggest that the agency should further investigate the RSTI and TDM alternatives. These projects are much less expensive and much more productive than rail in terms of the MTA's own measures.
Air Quality

The MTA's air quality predictions covary closely with the agency's mobility chart, except that the RSTI low, medium, and high options all produce the same Air Quality Cost-Effectiveness Index values. This is because all three RSTI options include the Alameda Corridor project, which tends to dominate the index value. As before, all rail transit projects rate very poorly compared to almost anything else.

Unfortunately, some of the measures identified in the plan are likely to have a pronounced negative impact on air quality. MTA's planned reduction in off-peak transit service suggests that a large number of off-peak and nonwork trips taken by marginally transit dependent individuals will be shifted from transit to automobiles. MTA has not focused attention on nonwork trips, and the plan fails to recognize the negative impact this shift would have on air quality in Los Angeles. Many of these displaced trips would be replaced by very short automobile trips that produce far higher emissions per mile than longer trips. Displaced transit riders who are forced to buy automobiles will be low-income individuals unable to afford newer, cleaner vehicles or to keep their automobiles in tune. The implications of this shift are substantial, because an old car can run hundreds of times dirtier than a new car. The dirtiest 10% of cars are responsible for more than 60% of mobile source carbon monoxide and hydrocarbon emissions. The cleanest 80% of vehicles account for less than 12% of these emissions (Lawson, Groblicki, & Stedman, 1990).

The Weak Case for Rail

The body of the plan (LACMTA, 1995b, p. 13) examines how the 14 proposed rail projects compare to each other but does not attend to comparisons between rail and other alternatives. Such comparisons are buried instead in the plan's technical appendix:

The lowest performing category (for mobility improvements) was generally the rail projects where the small market of transit does not provide a substantial overall contribution to countrywide mobility.

The rail projects did not do well (in improving air quality) largely due to the fact that most of the rail ridership is composed of people who were already transit users. (LACMTA, 1995d, p. 18)

Furthermore, the scores generated by the MTA's analysis of rail alternatives provide no substantive insight into how the rail projects put forward in the plan are selected for recommendation. The Red Line East and the Red Line West are proposed for construction as part of Scenario 1. Neither of these scores well in terms of the MTA criteria (LACMTA, 1994d). The MTA states that the Red Line East and West are selected because they did well on other criteria, but these remain almost completely unspecified. The plan reports that "the Metro Red Line Extensions to the west and east, when run individually, were among the top three in all categories of rail ridership per mile of line" (LACMTA, 1995b, p. 23), but this is circular logic. These are the only two heavy rail projects under consideration, and heavy rail has a carrying capacity several times that of light rail. The outcome the plan refers to is a foregone conclusion and thus has no use as a decision criterion.

The plan recommends but does not score the San Fernando Valley subway and Pasadena light rail lines. These projects are treated as MTA board mandates exempt from evaluation, even though currently there are insufficient funds to finish the Pasadena Line and no programmed funds to build the San Fernando Valley subway. Both rail projects remain on hold and will have to withstand scrutiny from the federal and state funding agencies before they can be funded. Federal review of the San Fernando Valley subway has not begun and almost certainly will not begin within a decade. State funds for the Pasadena Line have been approved but delayed for many years, most recently due to the FTA's prolonged dissatisfaction with the MTA's recovery plan. Recently, the California State Legislature showed its evaluation of MTA's capacity to construct the Pasadena Blue Line by establishing a new authority, almost totally separate from MTA...
(MTA gets to appoint one Board member), to build it. The project still faces considerable financing shortfalls, but the underlying political situation makes it appear likely that the new authority will produce a plan that at least claims to have the financial capacity to begin construction.

The plan does provide some indirect evidence of how the recommendation decisions were made. The plan asserts that “some projects (Red Line East and West, Burbank/Glendale, CBD) will perform significantly better when part of an expanded system since the Baseline Scenario provides relatively sparse accessibility compared to the highway system” (LACMTA, 1995b, p. 13). This is the standard mantra of rail advocates who argue that to capture the full potential of rail, we must expand the system. This is an elegant argument because it can never be disproved. No matter how much rail is built, no matter how high the cost, and no matter how low the ridership, rail advocates can continue to claim that if we just build more rail, ridership, benefits, and cost-effectiveness will eventually improve.

**Ignoring Federal Standards**

The MTA decision process does not conform to existing or proposed FTA planning requirements. One of the key measures the FTA uses to evaluate rail new starts is the cost per new passenger.

To progress from the “system planning” phase to the “alternative analysis” phase, the preliminary estimate of the cost per new trip should not exceed $10; to move from alternatives analysis to “preliminary engineering,” the estimated cost per new trip should not exceed $6 (These values were expressed in 1984 dollars. The MTA costs that we will be evaluating were expressed in 1993 dollars. Updating the FTA $6 and $10 standards to 1993 dollars produces $8.70 and $14.50 as the new cut-off points). (FTA, 1994b, p. 13)

The MTA has computed these values for Los Angeles rail projects, but the plan does not include these estimates. Precursor documents (appendix “Year 2015 Rail Ridership Estimates—Cost Effectiveness Indices”) report that public costs per new transit trip for the 14 rail projects in the plan range from a low of $16.31 to a high of $98.38. The three rail lines the plan proposes for federal new start funding do not rank well. No cost per new trip is provided for the San Fernando Valley line. For the Red Line West and East, the public costs per new transit trip are $28.36 and $60.83, respectively. In contrast, most bus trips can be added at costs well below $5 per new passenger, with many opportunities costing less than $2.50 (LACMTA, 1994e).

**Costs**

Every MTA rail project has had significant cost overruns, with some final costs running as high as 4 to 6 times original planning estimates. For example, the Full Funding Grant Agreement (FFGA) for the Red Line Segment 1 includes a budget of $1,249.9 million, with a federal share of $699 million. The federal share includes flexible federal Section 9 grants allocated to the region by formula. Cost overruns pushed the total cost to $1,417.9 million. None of this nearly $188 million overrun was funded by the federal or state governments. All must be absorbed by MTA and the City of Los Angeles.

The city required MTA to release it from its obligations for cost overruns on Red Line Segment 2 in exchange for continued financial participation in construction of Segment 3. Extensive damage to private property above Segment 2 may result in a cost overrun in excess of $500 million (G. Schneiderman, personal communication, 1997). This estimate excludes construction cost overruns and costs associated with the Hollywood tunnel collapse. These are liabilities the city may now escape but that are still incident to the MTA and its insurers.

We conclude certain costs of construction of Red Line Segment 1 are not accounted for in the plan, including force account costs (the costs of MTA employees dedicating time to Red Line
Table 3: Long Beach–Los Angeles Blue Line Cost Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Cost Estimate ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>Caltrans feasibility study</td>
<td>146.6 million</td>
</tr>
<tr>
<td>1982</td>
<td>Parsons Brinkerhoff study</td>
<td>194 million</td>
</tr>
<tr>
<td>1982</td>
<td><em>Long Beach Press-Telegram, April 15, 1982</em></td>
<td>194 million</td>
</tr>
<tr>
<td>1983</td>
<td><em>Los Angeles Times, October 20, 1985</em></td>
<td>350-400 million</td>
</tr>
<tr>
<td>1984</td>
<td>Draft Environmental Impact Report</td>
<td>393-561 million</td>
</tr>
<tr>
<td>1984</td>
<td><em>Los Angeles Times, November 11, 1984</em></td>
<td>500-600 million</td>
</tr>
<tr>
<td>1985</td>
<td>&quot;The Rail Way,&quot; Los Angeles County Transportation Commission, June 1985</td>
<td>595 million</td>
</tr>
<tr>
<td>1995</td>
<td>Los Angeles County Metropolitan Transportation Authority 20-year long-range plan</td>
<td>877 million</td>
</tr>
</tbody>
</table>


construction), general and administrative costs, and capitalized interest costs (interest accrued on funds borrowed for construction of capital projects, net of interest earnings on such funds, from the time of borrowing to the commencement of operations). MTA also separates certain rail costs into separate line items, such as "Red Line Construction Mitigation." It is not possible to estimate these additional costs from available data, but they are not trivial. They may be as high as $100 million.

The plan shows federal funding of $666.9 million out of a total cost of $1,446.3 million for the Red Line Segment 2 and a federal share of $1,582.6 million out of a total cost of $2,782.0 million for Segment 3 (LACMTA, 1995b, p. 95). Of these Segment 3 federal funds, $166.3 million are Surface Transportation Program (STP) and Congestion Mitigation and Air Quality Improvement Program (CMAQ) funds that, unlike federal Section 3 capital funds, are not dedicated at their source for specific projects. These funds could be used for other purposes.

The $188 million (16%) cost overrun on the Red Line Segment 1 project is the smallest of any MTA rail project to date. Richmond (1991) documents the details of Blue Line cost estimates in Table 3. The LACTC finalized the $877 million cost estimate for the Blue Line in 1989, and this has remained the official cost estimate ever since. A review of project costs reported by Peterson (1990) shows, as in the case of the Red Line Segment 1, no reported costs for many items necessary for the construction of rail lines. These omissions include capitalized interest costs during the period of construction and LACTC force account and general and administrative costs. It is not possible to calculate these costs from the data available, but the capitalized interest costs alone may be sufficient to increase total Blue Line construction costs to more than $1 billion. Also, the MTA cost figures do not include interest expense after the Blue Line went into operation. Again, it is not possible to calculate these interest costs from available data, but they are on the order of several hundred million additional dollars.

We consider the Green Line and Pasadena Line together due to the way the MTA treats the costs for these lines. The MTA does not show the costs of rail cars as part of the costs of the Green Line nor of the Pasadena Line. Instead, there is a separate line item in the rail budget for the LA Car, an order originally valued by the plan at $257.6 million that will supply most of the rail cars used on these two lines. This order was later reduced from 74 to 52 cars, reducing the cost to $228 million or $4.38 million per car. Prior to the delivery of the LA Cars, Green Line operations are conducted with Blue Line cars provided under a separate order for 15 additional cars at more than $3 million each. At present, MTA has excess rail vehicles, and additional cars for the Green Line cars may never be required (LACMTA, 1998a).

Table 4 summarizes the progression of cost estimates for the Green and Pasadena Lines. Assuming an approximate cost of $30 million per mile in 1986 dollars for the elevated section of the Green Line and accounting for the cost of the LA Car order, the total cost becomes $1,978 million, an increase of $1,119 million (130%) above original estimates. As with the MTA's other rail lines, many of the costs of rail construction have been excluded, including capitalized interest costs during construction, force account, and general and administrative expenses.

LACTC entered into an agreement with the Los Angeles labor community to pay the Federal Davis-Bacon labor rates for work performed on all rail construction projects, even those with no federal funding. . . . The MTA labor agreement negates any cost reductions MTA might have otherwise achieved by making use of either nonunion construction workers or union workers paid lower than the Davis-Bacon rates.
Table 4: Green and Pasadena Blue Line Cost Estimates

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Cost Estimate ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Line</td>
<td>LACTC Official Statement for Bond Issuance</td>
<td>178 million①</td>
</tr>
<tr>
<td>1986</td>
<td>Green Line Fact Sheet</td>
<td>368 million②</td>
</tr>
<tr>
<td>1992</td>
<td>30-year plan</td>
<td>763.6 million③</td>
</tr>
<tr>
<td>1995</td>
<td>Long-range plan</td>
<td>722.4 million</td>
</tr>
<tr>
<td>Pasadena Blue Line</td>
<td>Undocumented early estimate</td>
<td>581 million</td>
</tr>
<tr>
<td>1988</td>
<td>LACTC 30-year plan</td>
<td>689.7 million</td>
</tr>
<tr>
<td>1992</td>
<td>LACMTA budget</td>
<td>841 million</td>
</tr>
<tr>
<td>1993</td>
<td>LACMTA 20-year long-range plan</td>
<td>998 million</td>
</tr>
</tbody>
</table>


NOTE: LACMTA = Los Angeles County Metropolitan Transportation Authority. LACTC = Los Angeles County Transportation Commission.

a. This cost projection is for the 16.5 mile section of the Green Line in the median of the Glen Anderson (105) Freeway, including rail cars, train control, signaling, maintenance, and related facilities. The 3.5-mile North-South section at the eastern end of the line is not included. This shorter section was constructed on an elevated alignment at a higher cost per mile than the at-grade segment.

b. Los Angeles County will have the first fully automated transit line in the United States, running from Norwalk to El Segundo.

c. This total includes cars. The nonvehicle portion is $650.6 million.

The Federal Davis-Bacon Act requires that all laborers on federally funded construction projects be paid the local prevailing wage. LACTC entered into an agreement with the Los Angeles labor community to pay the Federal Davis-Bacon labor rates for work performed on all rail construction projects, even those with no federal funding. In return, MTA received a no-strike agreement from local construction unions. Because the Department of Labor interprets the prevailing wage as the top rates paid to unionized workers, the MTA labor agreement negates any cost reductions MTA might have otherwise achieved by making use of either non-union construction workers or union workers paid wages lower than the Bacon-Davis rates.

Revenues

With the exception of sales taxes, which constitute the MTA’s most important local source of funds, the plan significantly overstates almost every major revenue source. These include federal Section 9 capital and operating funds, Federal Intermodal Surface Transportation Efficiency Act (ISTEA) funds, federal Section 3 new start funds, Red Line Segments 2 and 3 Benefit Assessment District (BAD) funds, senior lien bonds, joint development funds, City of Los Angeles funds, State Transportation Improvement Program (STIP) funds, state rail bond funds, other State of California funds, bus fares, and rail fares. These optimistic revenue forecasts helped mask the magnitude of the debt the MTA was likely to accrue as the agency pursued costly rail projects.

RAIL CONSTRUCTION

The plan is particularly optimistic with respect to revenues that can be programmed for new capital projects. The plan (LACMTA, 1995b, p. 118) assumes that federal Section 9 (now Section 5307) operating assistance subsidies will be held constant, whereas congressional action in the year the plan was being prepared led to a reduction of almost 50% in the first year of the plan period. The Transportation Equity Act for the 21st Century (TEA-21) maintains federal formula assistance, but operating subsidies in areas with populations greater than 200,000, such as MTA, are no more. (However, TEA 21 now classifies “preventive maintenance” as a “capital” expenditure.) This phase out of Federal transit operating assistance was long anticipated by all transit industry
observers after the "Republican Revolution" election returns in November 1994 (American Public Transit Association [APTA], 1995), but MTA, virtually alone in the transit industry, did not regard it as a serious threat.

Historically, federal Section 3 new start funds have been 100% specified by Congress. MTA has received by far the largest allocation of these funds for many years. For fiscal year 1995, Congress allocated $397.0 million in Section 3 funding, with $184.3 million (46%) recommended for Los Angeles. For fiscal year 1996, USDOT (1995) recommended $135.85 million in funding for the MTA.

There are dozens of other regions seeking access to these funds. In fiscal year 1996, the House allocated $125 million to the MTA for the Red Line. One of former Oregon Senator Packwood's last major actions was to shift a large share of Section 3 new starts funds to Portland's Westside light rail project. As a result, the Senate allocated $60 million to Portland and only $45 million to the MTA. The Congressional Budget Conference Committee split the difference by finally allocating the Red Line $85 million.

Still, MTA is proposing 50% federal funding for the three Red Line subway extensions identified in the plan and asking for a total federal commitment of $2,932.7 million (LACMTA, 1995b, p. 109). The House Budget Committee fiscal year 1996 budget resolution called for the elimination of all fixed guideway new starts not already subject to a Full Funding Grant Agreement. Despite the committee's resolution, Congress has continued to fund some new rail starts. While MTA did receive $62 million for construction of the Red Line Segment 3 North Hollywood in the FY'99 Transportation Appropriations bill, $24 million of this was funds that had been appropriated to MTA the prior year for the Red Line Segment 3 Eastside. Therefore, MTA only received $38 million in new funding from its latest Congressional funding attempt, far less than the $100 million it had asked for, even further less than the $158 million in the Full Funding Grant Agreement schedule, and continuing what has become a constantly decreasing federal funding pattern for Los Angeles transit projects.

The MTA has never achieved 50% federal participation in any of its rail lines and is unlikely to ever do so. Construction of the Blue Line was financed completely by local sales taxes. There are no federal funds planned for the construction costs of the Pasadena or Green Lines. With the exception of $55 million in Federal Emergency Management Agency (FEMA) funds promised following the Northridge earthquake, there has been almost no federal commitment to Los Angeles' Metrolink commuter rail system.

The plan assumes a high level of funding from the State of California, even though the last three statewide rail transit funding/bonding proposals were rejected by the voters by increasingly wide margins (LACMTA, 1995b, pp. 109, 114). MTA is planning on $346.1 million from other state funding (LACMTA, 1995b, p. 104) to replace $316.6 million in state rail bond funds. The California Transportation Commission (CTC) allocates state transportation funding, including STIP funds. The CTC has committed to replacing the approximately $800 million in rail bond funds that would have been generated for the Pasadena Blue Line and the San Fernando Valley East/West Line by failed Propositions 156 and 181. However, the CTC has put the MTA on notice by refusing to accept the agency's Regional Transportation Improvement Plan for inclusion in the state plan. The commission required the MTA to provide an acceptable plan by December of 1998 or the CTC would remove $400 million in rail bond funds and $200 million in state nonrail capital from MTA control.

The plan (LACMTA, 1995b, p. 115) refers to Certificates of Participation (COPS). These are City of Los Angeles funds. The plan does not define how much the city will be asked to contribute during the plan period. The MTA secured $200 million in city funding for Red Line Segment 3 by forgiving $90.5 million in cost overruns on Segment 2 and capping the city share of cost overruns on Segment 3 at $58.9 million.

Initial agreements required the city to pay half of rail construction cost overruns on Red Line Segment 1 and up to $90.5 million on Red Line Segment 2. Originally, the city share of the Red Line Segment 1 cost overrun was approximately 7% of the segment's total cost. This has made the city reluctant to share the cost of future overruns. Over the course of four years, the city succeeded in negotiating a reduced share of the Segment 1 cost overrun and exemption from

Construction of the Blue Line was financed completed by local sales taxes. There are no federal funds planned for the construction costs of the Pasadena or Green Lines.
responsibility for the Segment 2 overrun in exchange for entering a funding agreement for Red Line Segment 3. The city’s pledge of $200 million for Segment 3 was subsequently reduced to $59 million when the MTA failed to meet several additional conditions associated with the agreement.

The plan language dispels the inevitability of a funding shortfall and leaves the impression that MTA could have more than $16 billion to use for new rail projects over the next 20 years. If the plan is followed, the MTA will find itself committed to construction of rail lines it cannot afford to build or operate, while simultaneously being forced to significantly increase fares and reduce service across all modes.

CHANGES IN BUS FUNDS

The voters of Los Angeles County passed Propositions A and C in 1980 and 1990, respectively. Both are half-cent sales taxes dedicated to transit. The plan (LACMTA, 1995b, p. 104) description of Proposition A and C expenditures includes a designation for “Transit and Other” that accounts for almost half ($29,703.9 million) of all such funds but provides no further details. Further explanation is available in companion documents (LACMTA, 1995c, pp. 68-69). Proposition C 40% discretionary funds constitute almost the sole remaining source of unspecified, discretionary funding available to the MTA. In the plan, these funds are forecast to be $5,115.3 million. More than 80% of this funding is dedicated to rail. This is separate from transfers of Proposition C 25% Transit Related Highway Improvement funds that MTA has succeeded in programming for rail construction.

In Proposition C 40% discretionary funds, $530.2 million (9.8%) are dedicated to bus, of which $444.9 million is to be expended during the plan period. The plan (LACMTA, 1995b, p. 104) is also diverting approximately 15% of Transportation Development Act (TDA) Article 4 funds traditionally used for bus operations and capital purposes to rail. The plan dedicates $230.0 million in TDA funds to “Misc. Rail/Rehabilitation” and $754.5 million to “MTA Rail Operations and Metrolink.” The net effect of Proposition C 40% discretionary and TDA Article 4 fund decisions is to reduce funding for bus by $454.3 million over the plan period. The plan narrative is silent on this shift.

Conclusions and Recommendations

The plan reports that MTA’s vision is to develop a multimodal system that better serves the needs of transit dependent riders, while also providing a network that will attract solo drivers out of their cars, primarily through faster transit speeds, improved quality of services and more commute choices. (LACMTA, 1995b, p. 6)

The agency uses the term multimodal as an euphemism for construction of an expansive urban and commuter rail system. The MTA’s plan is constructed to justify this decision and not to inform it. Multimodalism is a means, not an end. It is an outcome, not a starting point. At best, the MTA’s interest in rail suggests the agency is confusing ends and means. At worst, the plan is a cynical attempt to deceive.

CONCLUSIONS

The plan includes very little explanation of many of the most important concepts underlying the MTA planning process or the indicators the process generates. Fundamental assumptions, relationships, costs, and benefits are largely unexplained. Much data included in precursor documents are eliminated from the staff recommendation document and the final plan.
Our key conclusions concerning the MTA long-range plan are as follows.

- The plan shifts traditional sources of bus funds to rail, imposing a net reduction of $454.3 million in funds over the plan period for the most crowded urban bus system in the United States.
- The plan increases the number of buses but implies a significant reduction in services provided, resulting in a per capita reduction in nonwork transit ridership of more than 50%.
- The performance indicators described in the plan are skewed in favor of rail in part because the plan accounts only for local costs in cost-effectiveness calculations.
- The MTA’s air quality analysis does not consider the possibility that planned reduction of bus service will induce many trips to be made in older, higher emission automobiles.
- The plan does not evaluate reasonable alternatives to rail lines, avoiding discussion of lower cost options. Busways, HOV, and high occupancy toll (HOT) lanes, bus malls, bus priority/preference traffic signalization, smart shuttles, and jitney services are never evaluated as potential alternatives to rail lines.
- The plan includes population forecasts that are too high, leading to forecast travel speeds that are unrealistically low. The MTA uses different population forecasts for the plan’s finance models and transportation models, making the plan’s financial and transportation components inconsistent.
- The plan’s rail ridership forecasts are not creditable. According to the MTA, if all the light rail lines presented in the plan were constructed, the five most heavily used light rail lines in the United States would all be in Los Angeles.
- MTA’s forecast of available funds is not creditable. The federal and state funds MTA is planning on using to build rail lines and provide operating assistance are unlikely to be available.
- The plan is inconsistent with federal planning requirements. The rail lines for which MTA anticipates federal funds do not meet minimum federal standards for cost-effectiveness.

The end result of transportation planning and engineering exercises should be a superior transportation system. This goal is within MTA’s grasp. Indeed, it is difficult to find a transportation agency in the United States that has more funds available to it than MTA in terms of either total revenue or revenue per capita. What went wrong?

Almost all organizations, public and private, exist to grow. But the rules for growth in the public and private sectors are quite different. In the private sector, organizations grow by controlling costs and acquiring market share. In the public sector, the pay-off from this sort of efficiency is likely to be negative. Efficiency makes it more difficult to argue for larger budget allocations or for more tax revenues. If resources are not being expended, this is evidence no more resources are needed, and growth will not occur. The Los Angeles rail initiative has brought considerable resources under the control of the MTA. This could explain why the MTA pursued a course that is so difficult to justify or even to understand.

RECOMMENDATIONS

Transportation plans should be initiated by asking, “Where do people live, and where do they want to go?” Whether the answer to this question is a rail system is function of resources, tastes, and technology. The MTA should not begin its analysis with a specific technology in mind. Rather, the agency should evaluate a variety of workable alternatives to determine which one provides the best results.

The MTA is at a crossroads. The Los Angeles rail plan is a failure, and the agency must define and pursue realistic transit alternatives if it is to retain control of its mission. We offer a few principles likely to provide improvement.

... rules for growth in the public and private sectors are quite different. In the private sector, organizations grow by controlling costs and acquiring market share. In the public sector, the pay-off from this sort of efficiency is likely to be negative.
Do Not Trade Buses for Trains

In Los Angeles County as in most of North America, rail is an expensive, ineffective use of scarce resources that would be better used to support more cost-effective means of transportation. This includes expansion of the Los Angeles County bus system, improvement in the quality of bus service, reduction in bus fares to meet the mobility requirements of the transit-dependent, new TSM and TDM measures, support of multipassenger automobile travel such as expansion of the HOV system and busways, and implementation of peak period pricing strategies such as introduction of HOT lanes.

Los Angeles has never had a problem attracting passengers to transit. MTA's buses are the most crowded of any major transit operator in the United States. However, bus overcrowding and other factors make bus travel socially unacceptable to the middle class. Transit use can be greatly increased by providing buses that do not pass by riders due to lack of space; buses with available seating; safe, clean vehicles operating on a more frequent schedule and longer hours; and routes connecting where people are to where they want to go.

Beginning in fiscal year 1983, an allocation of approximately 20% of Proposition A tax receipts was used to cap the SCRTD base fare to $.50. By the simple expedient of reducing fares from $.85 to $.50 for a 3-year period, SCRTD and the other Los Angeles County transit operators were able to induce a transit modal split that is almost 14% higher than the mode split projected for Scenario 1. This mode split was achieved in just 2 years with almost no capital cost increases. SCRTD transit ridership rose more than 40% and was still increasing in the last month of the experiment.

In 1996, MTA was allocating approximately 70% of both local and total transit subsidies to rail. This share is about 60% over the entire plan period. The inevitable result is a reduction in the overall level of service provided to the public and a decrease in transit ridership (Moore, 1993). MTA commenced significant rail construction in approximately fiscal year 1986. Since then, total transit use in Los Angeles County has dropped by well above 20% (LACMTA, 1993; SCRTD, 1985). The total population of the county has increased by more than 13%, and the transit-dependent population of the county has increased far more rapidly. This outcome has a negative impact on regional transportation and equity goals, including reducing freeway and street congestion and improving air quality.

Evaluate Busways

The capacity and level of service provided by exclusive guideways should not be ignored, but trains are the least flexible options. Many benefits can be achieved by placing buses on exclusive guideways. Busways can provide higher capacity than rail lines, because vehicles can travel seconds apart rather than minutes apart. Furthermore, buses can leave the guideway to collect and distribute passengers: Trains cannot. Facilities such as Los Angeles' El Monte Busway along I-10 east of downtown are also cheaper to build than rail lines.

The plan indicates that "the El Monte Busway now carries as many people as three regular traffic lanes" (LACMTA, 1995b, p. 65), but this is incorrect. Busways are much more productive than the plan reports. As Table 5 shows, the El Monte Busway is now an HOV lane and not a pure busway. The busway provides the capacity of about 5.7 standard freeway lanes. Buses produce approximately 27% of the throughput index value or about 55% more than a standard freeway lane. The remaining 73% is due to HOV use, but this high share of HOV traffic is not necessarily typical for a busway. Houston's 46.5 mile transitway system serves 60,000 person trips daily, 41% of which are carried by transitway buses (Texas Transportation Institute, 1989).

The MTA plans to evaluate existing freight rail alignments for Railbus service. Railbus technologies have been studied by many U.S. metropolitan areas. None have been operated in recent years other than as short-term demonstration projects. We presume the lines recommended for evaluation in the plan's Railbus Corridor map (LACMTA, 1995b, p. 63) are listed because the lines already exist. In such cases, busway options should also be considered.
Table 5: Performance of the El Monte Busway

<table>
<thead>
<tr>
<th></th>
<th>Baseline Freeway Lane</th>
<th>Buses</th>
<th>Car/Vanpools</th>
<th>Busway Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles/hour</td>
<td>1,700</td>
<td>49</td>
<td>1,213</td>
<td>1,262</td>
</tr>
<tr>
<td>Average occupancy/vehicle</td>
<td>1.12</td>
<td>31.2</td>
<td>3.2</td>
<td>4.3</td>
</tr>
<tr>
<td>Passengers past a point</td>
<td>1,904</td>
<td>1,529</td>
<td>3,882</td>
<td>5,410</td>
</tr>
<tr>
<td>Average speed</td>
<td>27</td>
<td>52</td>
<td>55</td>
<td>54.88</td>
</tr>
<tr>
<td>Throughput index²</td>
<td>51,408</td>
<td>79,498</td>
<td>213,488</td>
<td>292,986</td>
</tr>
<tr>
<td>Freeway lane index</td>
<td>1.00</td>
<td>1.55</td>
<td>4.15</td>
<td>5.70</td>
</tr>
</tbody>
</table>


a. Throughput is measured in passenger miles per hour, peak hour, peak direction.

Open the Planning Process

The quality of the MTA’s planning process is extremely important, because the agency has a tendency to treat plans as mandates. The MTA asserts that

the Long range plan was designed to provide a flexible policy framework and planning tool for the evaluation of complex transportation policy choices and funding decisions within the 20-year planning horizon. While the plan provides a framework and overall policy direction for these other plans and processes, it is not a substitute for separate, specific MTA Board action on these documents. In addition, the fact that a project is included in the Long range plan is not a substitute for Board action on the project. All review, approval, and regulatory requirements related to each specific project are performed independently of the Long range plan. (LACMTA, 1995b, p. 40)

We do not believe this is true. The decision to build the Pasadena Blue Line is an excellent counterexample. This light rail line was included in the LACTC 30-year plan at the top of the rail implementation list. When the fiscal year 1994 budget was up for adoption in May through August of 1993, the finances of MTA made it obvious that there was insufficient funding to complete the Pasadena Line. During this period, board members consistently made the argument that the time for decision was over, that the MTA had committed to start construction on the Pasadena Line when the 30-year plan was adopted, and that MTA was obligated to begin construction, which it did.

The process used to develop the MTA’s long-term plan has been almost exclusively internal. The plan reports a partial review by a group of transportation planners that appraised “the travel forecasting procedures being used for the Red Line Eastside studies (and) revised methodologies developed by your staff for the Long Range Transportation Plan Development” (LACMTA, 1995b, p. 40, appendix).

This exercise is useful but is limited to specific changes made in the modeling process. It is not substantial enough to constitute a comprehensive review of the plan or of the MTA planning process. No independent experts have been substantively involved. The costs of this inward-looking, self-referencing approach are high and are continuing to accumulate. We recommend the MTA open its planning process to external participation and expert review and still retain the authority to plan at all.

References


Los Angeles County Metropolitan Transportation Authority. (LACMTA). (1998c, January 14). *Special board meeting: Action to adopt the 1998 County Transportation Improvement Program (SB45).* Los Angeles: Author.


