

Policy Study No. 174

February 1994

THE COUNTERPLAN FOR TRANSPORTATION IN SOUTHERN CALIFORNIA: SPEND LESS, SERVE MORE

by

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EXECUTIVE SUMMARY

The 30-year transportation plan of the Los Angeles Metropolitan Transportation Authority is out of touch with the realities of transportation in Southern California. This region is characterized by low population density and the decentralization of jobs via continued suburbanization. These factors have led to continued growth in auto use and decline in the use of public transit.

Rail transit is the wrong kind of transportation for this region. Other cities that have tried adding rail transit have failed to increase transit's mode share, despite the expenditure of billions of dollars (and frequent infliction of harm on the pre-existing bus system). The same pattern is beginning to be evident in greater Los Angeles. Our first new rail line, the Blue Line, has a taxpayer cost of \$21 per rider per day. Since few of its riders are former drivers (as opposed to bus users), the system costs taxpayers \$37,489 per year for every car it removes from the freeways.

The key to solving L.A.s' transportation problem is to go with the flow rather than fighting it; i.e., to develop a transportation system consistent with our chosen land-use patterns. The key to doing this is to achieve higher vehicle occupancy on our streets and freeways. That means encouraging new forms of door-to-door transit via a three-part program: 1) create an expanded network of transitways, to permit meaningful time savings for eligible vehicles; 2) deregulate van, taxi, and jitney services to encourage innovation and entrepreneurship in creating these new modes; and 3) introduce peak-hour pricing on freeways, beginning with High Occupancy/Toll lanes.

In parallel with these three policy changes, those new rail lines that are not already fully committed should be canceled, permitting major savings in both capital costs and operating subsidies. In addition, the Metrolink commuter rail services should be canceled, with express bus and van services meeting the needs of those commuters.

The net effect of these policy changes would be significantly higher average vehicle occupancy, higher average speeds and reduced traffic congestion, greater transit use than under current rail-based plans, reduced air pollution, and over 125,000 new jobs in new transit firms (many of which would be entrepreneurial opportunities).

The net savings to taxpayers over the next 40 years from implementing this Counterplan would be more than \$123 billion.

I. INTRODUCTION

In a companion paper on recent transportation and development trends in the Southern California (the five-county CMSA) region, we reported the following findings:

1. While the Los Angeles CMSA grew by more than 3 million people in the 1980s (making it an "outlier" in terms of absolute growth), average traffic speeds in 1990 were well above the average for U.S. metropolitan areas.
2. Also, in spite of significant growth, average worktrip durations and distances have changed little in the last 25 years.
3. These benign outcomes are explained by suburbanization, jobs and people relocating to be nearer to each other. This view contradicts the popular "doomsday" scenarios that bemoan expected population, employment and traffic growth and presume that it will have to fit into areas presently developed.
4. Rapid suburbanization in the Los Angeles area continues with the downtown a declining regional center in spite of massive urban renewal investments.
5. As in other U.S. metropolitan areas, large numbers of nonwork trips (including those "chained" with worktrips) take place in peak traffic periods. The growth of traffic is partly explained by the increased mobility of females. Nondeteriorating trip speeds in the face of greatly expanded travel underscores the power of suburbanization as a traffic control mechanism.
6. The changes in mode choice between 1980 and 1990 document the continuing decline in transit use, decreased carpooling and more people working at home. More suburb-to-suburb commuting also explains diminished markets for conventional transit as well as the unpopularity of carpooling.

If the Los Angeles County Transportation Commission's 30-Year Integrated Transportation Plan (issued in April 1992) is in any way typical, local planners are out of touch with many of these facts. The Plan embraces traffic-and-growth-doomsday rhetoric to promote an expensive program strongly oriented to rail transit: \$183 billion (not discounted), of which \$78.2 billion is for rail transit to be spent over 30 years. The 750-word Introduction includes the following assertions: 1) "Average travel speeds will continue to deteriorate ..."; 2) "... attractive high capacity rail and bus alternatives ... [will] ... reduce the number of vehicles traveling on the highways"; 3) the Plan will result in a "strengthening of the overall economic viability of this region"; 4) the same program "offers an unprecedented opportunity to help clean up Los Angeles' air by reducing congestion and providing high-capacity nonpolluting transportation alternatives"; and 5) the Plan is "designed to deliver Los Angeles County the best overall return on its investment." None of these claims is supported by analysis in the body of the report.

Other local plans speak the same language. The Southern California Association of Governments' Regional Mobility Plan aims for a heroic 19.3 percent of commuters using transit by 2010, but cannot justify this target by sound analysis.

In light of the facts (and in spite of the misperceptions), what *should* planners do This paper argues that they should: 1) rethink one current policy (rail transit expansion); and 2) implement two neglected options: taxi/shuttle van deregulation, and roadway pricing (including an expansion of HOV [high occupancy vehicle] lanes accessible to fee-paying solo drivers) where there are significant bottlenecks. These approaches would complement current and future transportation system management measures.

II. RAIL TRANSIT AND THE MODERN AMERICAN CITY

Because the spreading out of activities reduces markets for conventional public transit, it should surprise no one that the U.S. transit industry has been in decline for most of the 20th century. Massive subsidies have not helped; they may have made matters worse. The Congressional Budget Office (CBO) concluded that "despite more than 25 years of federal assistance, mass transit carries only about 5 percent of people who commute to work. The other 95 percent mostly use automobiles. ...New federally assisted transit systems have not added to mass transit; instead, they have replaced flexible bus routes with costly fixed-route services to a few downtown areas, while the growth in jobs and population has been in the suburbs and in the smaller cities. At the same time, transit costs are rising: transit fleets in general are greatly underused, and the new transit systems have for the most part added to costs and to unused capacity without attracting riders from cars." CBO summarizes 25 years of academic research on the industry's decline and on its inability to adapt to changing conditions.

Whereas conventional transit (buses, subways, trolleys) was never intended to serve low density settlement and has, therefore, been losing badly in head-to-head competition with autos, the transit industry has been promoting projects that are widely acknowledged by transportation economists and planners to be particularly inappropriate to modern cities: fixed rail transit lines. The consequences of this error have been known to researchers for many years. Problems with the first post-WWII subway, San Francisco's BART, were published in 1976. The BART impact studies called attention to BART's disappointing performance (one-half of the predicted ridership at many times the expected costs) even though the project's developers "could not have chosen a better site." By 1980, Peter Hall included BART in his collection of *Great Planning Disasters*. George Hilton's 1974 study documented problems with *all* the federally funded transit projects made possible by the passage of the Urban Mass Transportation Act of 1964: "The program initially entailed capital grants for the replacement of buses, for the building of rail systems, for the conversion of remaining privately owned transit systems to public ownership, and for demonstration projects. So constituted, the program by 1974 was demonstrably unsuccessful." Likewise, in 1976 Martin Wohl reported the continuing decline of the five older U.S. subways. He also documented problems with the Dan Ryan and Kennedy Lines in Chicago, the Lindenwood Line in New Jersey, the South Shore Line in Boston, and the Airport Extension in Cleveland. He concluded that "the record is sordid, to be blunt about it, and it seems high time to blow the whistle on the high-priced PR experts and fancy analysts who estimate and bandy about the expected costs and revenues for these modern-day urban saviors."

Yet, whistle blowing seemed not to matter. It is now apparent that had politicians (or enough taxpayers) taken these reports seriously, the nation could have been spared the waste documented in Donald Pickrell's more recent U.S. Department of Transportation report. That study identified problems with each of the major post-BART rail transit projects. The study showed that: i) the recently installed "heavy-rail" systems experienced ridership shortfalls averaging 35 percent (weighted); ii) the new "light-rail" systems fared even worse, with a 65 percent (weighted) patronage shortfall; iii) combining low ridership with severe cost overruns (construction and operations), (weighted) costs per boarding were \$8.66 for the subways and \$7.99 for the streetcars; iv) three of the eight cities studied lost net *system* patronage after rail opened because of higher bus fares (to cover rail red ink), bus service cutbacks (also to cover cost overruns), and bus realignments (cancellation of parallel-to-rail lines and feeder use of buses; see Figures 1, 2, and 3); v) where there have been gains in *net system-wide* transit use, they have been expensive, ranging from \$9.49 per added passenger trip (Portland) to \$34.64 per added passenger trip (Pittsburgh).

Even the federal reports suggest that the incentive structures that Congress has attached to federal funding have led local planners to choose heavily capital-intensive options, including rail. As Wachs

(1989) has summarized, "the federal government has induced cities to overcapitalize their transit systems by designating large portions of the total subsidy budget for rail system construction.... Separate operating and capital assistance programs should be integrated into a single transit 'block grant' to be distributed among urban areas according to some agreed-upon formula." Until recently, an average of 70 percent of new rail construction costs were federally funded. Yet, this analysis of federal incentive structures does not tell the full story; the massive rail projects proposed for Los Angeles county are (as a whole) only 20 percent federally supported. Sizable revenue sources, especially sales taxes, have been tapped locally. Local policy errors must be attributed to the arbitrariness of local ballot initiatives and the success of local interest-group politics. The Los Angeles Times recently reported that "the biggest single gathering of business lobbyists in California takes place during meetings of the Metropolitan Transportation Authority.... Nothing in the annals of California lobbying has ever equaled it. A total of 1,234 men and women are paid to influence LAMTA's decisions, 179 more than those who lobby the Legislature."

In all U.S. cities, transit is highly regulated (often resulting in legalized monopoly arrangements), unionized, and heavily subsidized. Recent national summaries show that during the 1980s total urban vehicle miles traveled grew at an average annual rate of 4.1 percent while transit passenger miles grew by 0.4 percent. The costs of achieving this meager growth (and declining share; transit commuting fell from 14.2 percent to 11.6 percent by central city residents, and from 4.0 percent to 3.1 percent by suburban residents) have been very high. The transit industry's expenses grew by 10.6 percent per year. Transit industry jobs grew by 3.4 percent per annum. Fares went up 8.6 percent per year while total operating costs grew by 9.5 percent per year. Federal operating subsidies fell by 2.4 percent per year while state and local subsidies climbed by 12.3 percent per year. By 1990, passenger fares covered only 36 percent of operating costs (a historic low) and made zero or minimal contribution to capital costs (Table 1). These data reflect the success of a powerful interest group: the transit industry, its vendors, and unions. In Los Angeles, current efforts to use transport-dedicated public funds to breed local railcar (and electric vehicle) manufacturing industries expand this approach to a full-blown local industrial policy.

Most disappointing of all, in the ten "new rail" cities, the eight federally supported projects analyzed by Pickrell plus the systems (San Francisco and San Diego) financed from local sources, the commuting transit share declined in every case (except San Diego, where it remained stable) between 1980 and 1990, by as much as 36 percent (Atlanta); see Figure 4. What possible rationale could there be for massive public funding for rail systems that not only fail to maintain transit's share but lead to a reduction in overall transit usage

III. RAIL TRANSIT IN LOS ANGELES

We reported in our earlier paper that, in spite of extensive metropolitan decentralization in Los Angeles, the focus of local transportation planning is a downtown-oriented rail transit system. The Los Angeles County Transportation Commission's 30-year "Integrated Plan" county-wide expenditures of \$183.5 billion include \$78.2 billion for eleven rail lines (\$55.6 billion for capital expenditures and \$22.6 billion for operations and maintenance). Of the \$21.5 billion dollars that the four surrounding counties plan to spend in 1993–2000, almost \$5 billion are earmarked for fixed rail transit.

Recently compiled four-county (Los Angeles, Orange, Riverside, and San Bernardino) historical expenditure data document the recent escalation in transit expenditures. Between 1989 and 1991, regional transportation expenditures (current dollars) grew by 44 percent. Los Angeles County's expenditures grew by 46 percent while the county's capital expenditures on rail grew by 156 percent.

Although these plans were made possible by a series of ballot-funding victories for rail advocates in the years 1980–90, the inappropriateness of rail projects generates a vicious cycle: "doomsday" traffic pronouncements are used to gain funding, new resources support ambitious plans, planned rail systems fail and inevitably become "underfunded," and then even greater access to tax revenues is promoted. These cycles can go on for many years, but they cannot continue indefinitely. In spite of having won three transportation funding measures in the June 1990 election, the California Transit Association now reports that more than \$4 billion of new "funding requirements" are needed to make planned rail systems "operationally solvent." The dollar amounts cited in the 30-Year Plan, massive as they are, are now recognized as grossly insufficient.

Los Angeles County planners claim that 500,000 daily auto trips will be removed when their system is completed. Such forecasts fail to take account of the "Iron Law" of freeway congestion, formulated by Brookings Institution researcher Anthony Downs: in the absence of pricing, any freeway capacity made available by trip-reduction programs will soon be utilized by new trips (latent demand).

The first completed project from Los Angeles County's 400-mile rail plan, the 22-mile Los Angeles-Long Beach light rail line (the Blue Line), has been operating since July 1990. To assess its cost-effectiveness, James Moore used a capital cost of \$877 million (as reported, but underestimated because many Blue Line-related costs were not charged to the project), standard assumptions of a 10 percent opportunity cost of social capital and a 40-year project lifetime, and operating costs of \$38.6 million in fiscal 1991. Using the Southern California Rapid Transit District's August 1991 boardings of 32,600 per day (and assuming that weekend-day matches weekday boardings), Moore computed an annual cost per passenger roundtrip of \$7,873—or over \$21 per day.

But that is not the end of the story. Survey responses indicate that only 21 percent of riders were previously drive-alone motorists; most of them previously rode the (much-less-subsidized) bus. Thus, as a means of "getting single-occupant vehicles off the freeway," the Blue Line costs taxpayers *\$37,489 per year for every such car eliminated*. The Blue Line's trip costs are about double those on the four most recently completed light rail projects studied by the U.S. Department of Transportation. There *must* be cheaper ways of weaning solo motorists out of their preferred transportation mode!

There is some debate about current and future Blue Line ridership. The Metropolitan Transit Authority (LAMTA) claims that ridership is now much higher than it was in 1991 (although an internal estimate of the 1992 subsidy, at \$8,278 per roundtrip, is a little higher than the 1991 figure of \$7,873 quoted above). LAMTA has argued that the Blue Line will reach capacity levels (55,000) in the next few years. Even if this happens, the Blue Line will still be as costly as the other cities' light rail systems. Moreover, 55,000 is the line's peak capacity. The system was designed in a way that precludes both much shorter headways (the current six minutes could be reduced only to five) and an increase in the number of railcars per train.

Even larger cost overruns are yet to come. Local transit agencies have shown little inclination to contain costs. The recently opened "minimum operable segment" of the underground Red Line (4.4 miles, from Union Station to MacArthur Park, as advertised by the agency but recently admitted to be only 3.2 miles; the 4.4 miles includes the length of rail storage tracks) has cost \$330 million per mile when cost overruns are accounted for (actually, \$453 million per mile at 3.2 miles). That contrasts with \$188 million per mile when Congress provided the initial funding in 1983 (which would be \$265 million in 1992 dollars). It is also much larger than the \$101-million per mile cited for "CBD + 0.7 miles" in the first adopted environmental impact statement on this project in 1979 (\$170 million in 1992 dollars). The 25-cent "teaser" fare has been extended indefinitely because ridership has averaged only 15,000 boardings per weekday. When operating costs become known, the full costs per passenger

will probably surpass those documented for the Blue Line. In our previous paper, we reported that the recent closings of landmark enterprises along the Red Line route (including the Ambassador Hotel, Bullocks Department Store, and the Sheraton Town House Hotel) indicate that real estate markets are not optimistic about the performance of the subway.

The third of the eleven promised new rail lines is the 20-mile Green Line, now being built to run down the center of the recently opened I-105 Freeway from Norwalk to a location near Los Angeles International Airport (but not into the airport). Its estimated capital costs are around the \$1-billion mark (although this has not yet been admitted officially). The longest system by far in terms of mileage is the Metrolink Commuter Rail that carries workers from peripheral suburban locations to downtown. Four lines are currently running, and all nine lines will be operational by 1995. At first sight, this system might seem the most cost-effective of the rail components; its mileage is quite long and it uses existing track. But the opposite turns out to be the case in Los Angeles. Round-trip subsidies are huge; \$42.04 per trip according to the LAMTA FY 1995 budget projection, almost twice as much as the costly Blue Line, reflecting minuscule ridership (1.3 million passengers *a year*). Even if ridership increases as some commuters are lured out to attractive suburban locations with moderate-cost housing close to stations, the subsidies will remain massive. Worse still, the primary beneficiaries are relatively well-off office and government workers so that the subsidies are strongly regressive.

There are other problems: security costs the same scale (\$1.29 per passenger) as the more vulnerable Blue Line, and substantial fatalities (at least, initially) reflecting the lack of grade separation that allows both vehicles and pedestrians to cross the tracks relatively easily.

At the same time, transit advocates continue to succeed at manipulating ridership forecasts in what the *Los Angeles Times* (January 30, 1993) called an "elaborate shell game." Overly optimistic forecasts are advertised when the spending decisions are made; these are sharply reduced when the systems begin operations. Nothing else could so clearly betray the politicized nature of what passes for "planning" in local transit deliberations.

We noted in our previous paper that in the media celebration over Los Angeles' new rail projects, local bus riders have not received much attention. Diverting large sums to build expensive rail projects has been at their expense. In Los Angeles County, bus ridership fell by 20 percent (while population grew by ten percent; per capita bus use is down more than 28 percent), from a peak of 497 million boardings in 1985 to 403 million boardings in 1992 (Table 2). The steep decline in bus use began when the Southern California Rapid Transit District raised bus fares from \$0.50 in order to bank money for rail construction. LAMTA's costs of running the 2000-bus system continue to rise. Recent LAMTA internal studies have shown that Santa Monica's buses operate at 40 percent lower cost than LAMTA. Likewise, the Los Angeles Department of Transportation has produced figures showing the average municipal bus operator in the region has an operating cost of \$52.44 per hour compared with LAMTA's hourly cost of \$88.61 again, a 40 percent difference.

The key point, however, is that it is unlikely that the county's rail network, even if it ultimately reaches the planned 400 route-mile target, will ever lure back as many passengers as have been lost. As cost overruns in rail construction continue, bus service will be cut to make up the revenue shortfalls; bus patronage will necessarily fall. The great irony is that many fewer transit users will be served at many times higher cost. All of this is ignored in the ambitious 30-year master plan where the discussion on buses merely cites a planned 55-percent bus fleet expansion, bus electrification and clean-fuel buses. The bus fares that the MTA will have to charge, the demand that can realistically be expected at these fares, or the full costs to taxpayers are not discussed.

IV. WHAT CAN BE DONE

The current rail transit plans for Los Angeles cannot be justified in terms of results achieved for the funds expended. Their cost-ineffectiveness is staggering, and their wastefulness compares with the worst excesses of federal military purchases in the 1980s. Even the rail transit advocates are beginning to send signals of self-doubt. The new head of LAMTA, Franklin White, has backed away from the 30-year plan with a *de facto* admission that the plan is infeasible. Estimates of a \$4-billion shortfall in rail funding, despite the array of funding sources, reinforce this conclusion. In addition, the Southern California Association of Governments (SCAG) has more or less admitted that the 2010 target of a 19.3 percent transit mode share embodied in its 1988 Regional Mobility Plan cannot be achieved with the current rail-oriented plans, if at all.

The guaranteed failure of rail transit is not difficult to explain. Even if the rail transit plans were implemented in their entirety (a most unlikely outcome), the vast majority of the region's population will live (or work) too far away from transit stops to patronize the system. Of course, everybody could drive to a station and park there to take the train, but modal transfers add many minutes to door-to-door travel times (and still involve pollution-inducing "cold starts"). Door-to-door travel time is the major determinant of modal choice, and the decentralized spatial structure of the Los Angeles region means that only door-to-door travel modes (such as autos, taxis, and vans) are competitive for most people.

Increased vehicle occupancy in door-to-door vehicles is therefore the key to resolving the region's traffic congestion problem. HOV lanes and transitways for buses, vanpools and carpools would reduce these vehicles' trip times—a competitive advantage. Deregulation of shuttle vans and taxis would permit these kinds of vehicles to offer shared-ride *door-to-door* services more competitive with individual automobiles. Peak-hour pricing on freeways would raise the cost of rush-hour travel, stimulating the use of these alternatives. The key to a workable transportation strategy is to go with the flow, not fight against it. By this we mean that we need to design a transportation mix that is consistent with our chosen land-use patterns rather than in conflict with them. It is not hard to demonstrate that this alternative to current plans will save taxpayers large sums of money, will increase the mobility of most people, and will make some inroads into the growth of solo auto driving.

A. Transitways

Economic analysis can demonstrate that sunk costs are irrelevant: given the prospects for ridership and costs, the sensible decision would be to abandon Los Angeles' existing and planned rail transit lines as quickly as possible. Politics takes the opposite view: sunk costs are routinely used to justify further "investments." A possible compromise might involve the conversion of unused but acquired rights of way (and eventually even the current rail routes) to busways ("transitways" is the new label) and HOV lanes. These would supplement the current and planned system of HOV lanes being implemented by Caltrans, most of which do not yet include a transit component. They could also serve a third function: as pilot sites for testing and demonstrating peak-hour (congestion) pricing. Gordon Fielding and Daniel Klein have detailed the steps involved in gradually converting HOVs to HOTs (High Occupancy/Toll lanes). They suggest that underutilized HOVs be converted first. But this conflicts with the prescription that time-of-day pricing is most needed at major "choke points." These are the places least likely to have excess HOV capacity; extra HOV/HOT lanes would be more valuable at some of these points (see below).

Buses on Los Angeles's freeways ("Freeway Flyers") are an old idea, first proposed by Meyer, Kain and Wohl in 1965 and elaborated by Martin Wachs in 1976. Houston already has a "Transitway"

system operating on 46.5 miles of barrier-separated HOV lanes on its freeways. As many as 60,000 daily person trips take place on the HOV lanes, 41 percent of which are on transitway buses. The Automobile Club of Southern California (1985) proposed a regional express bus system to operate on the (then) 720-mile freeway system of the five-county area, supplemented by bus feeder systems operating along collector and arterial roads. Lori Campana conducted an economic analysis on the ACSC proposal and found it to be significantly more cost-effective than the (then) proposed Los Angeles County Transportation Commission's light-rail plans.

Currently, the only HOV lane with transit in Los Angeles is the 12.5 mile San Bernardino (I-10) Busway (found to have a lower benefit-cost ratio than regular freeway lanes but more cost-effective than conventional transit). This facility is also the only one currently restricted to three-or-more-member carpools (HOV-3). In February 1993, during the peak traffic hour, the I-10 Busway carried 49 buses with an average load of 31.2 passengers, at 52 MPH; there were also 1,213 vans and autos with an average occupancy of 3.2. Total busway peak-hour volume was 5,411 passengers, more than three times the average peak-hour lane of freeway traffic which Caltrans reports moves 1700 cars at 1.12 passengers per vehicle at 27 MPH.

The newly opened I-105 Freeway is scheduled to have express bus service on its HOV lanes. Construction is almost completed on a 64 foot-wide elevated HOV lane/busway along the Harbor Freeway (I-110) approaching downtown Los Angeles. That facility with two HOV lanes in each direction will include express bus service and will also feature several bus stations along the way.

SB 1402 (1990) mandated plans for a regional (intercounty, including Los Angeles, Orange, Riverside and San Bernardino Counties) transit system, including commuter rail and express buses. The consultant's report which has been prepared in response to the mandate, however, recommends few express bus additions, suggesting these only where rail is not yet planned. The report concedes that revenue deficiencies resulting from mandated funding for Metrolink (the system of commuter trains owned and operated by the Southern California Regional Rail Authority currently serving 8,100 riders per day) precludes significant bus service expansions. Nine "candidate regional services" are suggested for further study. These involve 194 new (one-way) route miles, only half of which would run on HOV lanes. A more ambitious HOV-HOT-Transitway network could eventually be cost-effective because it complements the two major proposals suggested here: 1) expanded taxi and shuttle service (via deregulation); and 2) the introduction of peak-hour pricing on selected routes.

B. Deregulation

Are there plausible substitutes for the private automobile in light of its ease of use, convenience and low operating costs? While the answer would seem to be obvious because of the widespread popularity of autos, many planners and policy makers continue to believe that conventional fixed-route transit is the only real alternative. They do so in spite of overwhelming evidence that more people forsake conventional transit each year than flock to it—in spite of the addition of substantial new capacity.

In increasingly dispersed cities, serious alternatives to the private auto must be more user-friendly than fixed route systems which usually require some other mode for getting to the transit line, one or more transfers, and unpredictable waits. Door-to-door or near-door-to-door service, such as that made possible by taxis and shuttle vans, is the only plausible competitor to the private auto, except for those few who live and work near transit stops. Corroboration of this point lies in the substantial use of these modes by low-income groups, even though they are restricted and overpriced because of current regulations. Tough regulations are in place to protect the suppliers of conventional transit from competition.

Our previous paper made the point that taxis and shuttles are heavily regulated at the present time, eliminating the possibility of competitively priced, yet profitable (economically efficient), service. Yet, a minor change in the State's regulations, one that would allow shuttle vans to use meters and rove for customers, would substantially increase the availability of these modes because few other restrictions on their operations are currently in place.

A recent study by the Urban Innovations Group (UIG) has shown that current rail-based plans have no chance of reaching the 19-percent transit ridership targets of the Regional Mobility Plan without the addition of a very large number (up to 125,000) of shuttle vans. The significance of this study is that it is the first research sponsored by a public agency (SCAG) to recognize the critical importance of shuttle services. The study is flawed in some of its details: it relies too heavily on center-to-center transit links (our previous research has shown that most center-based trips are to and from center hinterlands rather than with other centers) and it conceives of shuttle trips as a derived demand from more traditional transit use. But its conclusion that the wrong type of transit is now being installed is correct. The problem is that the UIG recommendations are too tentative and not radical enough. In Southern California any viable transportation system has to be ubiquitous, and the only cost-effective complement to automobiles is metropolitan-wide shuttle services, a mix of hail/dial-and-ride taxis and vans, subscription vans, and point-to-point jitneys, with the mix determined by market demand.

The scope for shuttle services is very broad. They could substitute for publicly subsidized paratransit services for submarkets such as health service trips for seniors, travel for the disabled, and shopping trips to congested areas from peripheral parking lots. They could provide low-capacity quasi-bus services to and from locations too distant from regular transit stops, especially for the nondriving populations. They might provide school bus service to replace parent drop-offs and pick-ups for children too far away from school to walk but not far enough to qualify for regular school bus service. They could function as commuter vanpools, especially for workers who want more flexibility than a daily employer-provided vanpool. As UIG suggests, they could function as a feeder mode to regular public transport. Point-to-point jitneys might have a market niche along some of the major arteries as a cost-effective alternative to regular bus service. In fact, the opportunities are quite varied. Of course, UIG is also right in their emphasis on the need for "Smart Shuttle" service with computerized tracking to achieve an effective balance between shorter waits and trip times and higher capacity levels of operation.

C. Congestion Pricing

Peak-load pricing is the spontaneous and economic response of private sellers managing fixed facilities subject to regular cycles of demand. Theaters (matinee prices), restaurants ("early bird" specials), resorts (off-season rates), telephone companies (cheaper after-hours long-distance rates), electric utilities (higher rates in summer in warm climates and in winter in cold ones) and others have long followed the practice of adjusting price to meet changing demand. Considerable literature by transportation economists has argued that highway authorities should follow these examples. Their failure to do so leaves only congestion to equate demand with supply.

The current availability of electronic toll collection systems suggests that variable time-of-day pricing is now feasible. The 1993 report by the American Academy of Arts and Sciences, *Avoiding the Collision of Cities and Cars* places this recommendation at the top of its list. The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) invites demonstrations of peak-hour roadway pricing. The 1990 Clean Air Act Amendments suggest that such approaches can be used to meet air quality targets. Currently, the San Francisco Bay Area has been selected as the site of the first congestion-pricing demonstration project; the bottleneck slated for the first tests is the San Francisco-Oakland Bay

Bridge. The bridge is a logical place to start for a variety of reasons. One of these is that other transbay modes are in service, allowing the option of toll avoidance for those who prefer that choice. The availability of alternatives is critical in making congestion pricing socially and politically acceptable.

The same effect could be achieved in Southern California by implementing peak-hour pricing on selected freeway lanes (such as existing HOV lanes), giving drivers the choice between time savings and cash savings. The problem with these politically convenient approaches is that they will inevitably leave some congestion on the nonpriced routes or lanes. Downs' "Iron Law" makes it clear that the extra capacity made available by pricing or by any other innovation will quickly be filled by latent demand on unpriced lanes. Only the full implementation of pricing, as proposed by Kenneth Small, would avoid this problem.

While Greig Harvey has shown that congestion pricing in Los Angeles would have substantial benefits and while there have been significant advances in toll collection technology, prudence suggests that a system that has people pay for what they now perceive to be "free" should be introduced incrementally; a series of demonstration projects would have to be tested first. Selected HOV lanes could become the designated tollways where the concept could be demonstrated and tested. Many would become HOV/HOT lanes that continue to allow free access to buses and three-or-more occupancy HOVs; all others, including solo drivers would be able to buy access. Where these facilities also fill the role of transitways, there may be a case for designating an additional lane.

Incrementalism is an effective strategy for overcoming public resistance. Public support for urban road tolls for Norwegian cities increased substantially *after* implementation when perceived benefits were realized. Also, the public's response depends a lot on what government does with the revenues collected.

V. COSTS AND BENEFITS

What are the *extra* costs and benefits of these proposals, compared with LAMTA's current rail-oriented plan

1. Caltrans suggests that the total cost of the 814-mile HOV system (existing and planned) is \$7.8 billion. Most of these lanes involve upgrades of "shoulders" and are accomplished at approximately \$2.5 million per lane-mile. Where an *extra* lane is needed to accommodate transit, carpools, shuttle vans, and paying solo drivers, as in our proposals, costs will be much higher. Caltrans' "elevated" transitways now cost approximately \$50 million per mile (both ways). If we assume that the current 40 percent of area freeways rated "F" by Caltrans (35 MPH or less) are the ones subject to our Transitways-HOT-lane proposal requiring extra lanes beyond the Caltrans plan, this would add \$16.3 billion (not discounted) in construction costs.

2. We expect, and the UIG simulations suggest, that most of the new transit use will be by new shuttle vans made possible by deregulation. As a "backup," new conventional bus service on transitways will expand, probably by a small factor. In any case, these costs are *already included* in the 30-year plan, which proposes a 55 percent expansion in bus service, including plans to expand express bus service "by nearly 50 percent, and operate it on the 300 miles of carpool lanes...." (p. 31). The same document reports that 20 major freeway bus stations will be constructed. The 30-year plan does not mention the cost of this particular expansion; it simply indicates that expenditures on *all* bus programs will amount to \$14.5 billion in capital costs and \$58.6 billion (not discounted) in operations and maintenance expenditures.

3. We assume that deregulation costs consumers nothing. Shuttle vans are unsubsidized; their user fees cover most roadway construction and maintenance costs; any reductions of highway use by autos as a result of deregulation are a saving.

What marginal benefits are made available by incurring these marginal costs? Revenues from implementing introductory peak-hour pricing will more than cover the costs of implementation and operation. While these will be less than the systemwide \$3-billion per year that Small uses (an analysis of the revenues from partial pricing on HOV/HOT lanes has not yet been developed), they are likely to be close to that number as most "choke points" will be covered. Over the presumed 40-year life of the rail system, \$2.5 billion in annual toll revenues would accumulate \$100 billion.

Ridership and mode switches under the many, far-reaching changes that have been suggested are difficult to estimate. At first glance, it appears that considerable savings could be incurred if existing rail plans are put on hold: the 30-Year Plan suggests \$55.6 billion in construction costs and \$22.6 billion (\$753 million per average year) in maintenance and operations costs. Even at these levels, there are already indications of a \$4-billion gap because of revenue shortfalls and cost overruns. To avoid the coming fiscal catastrophe and to substitute our more viable counterplan, we must first ask: What are the prospects that the rail-building frenzy might be stopped? They appear to be very small, in the short- to medium-term. Commitments have been signed on all three segments of the Red Line, the Green Line is under construction by court order, and commitments have also been signed on the Pasadena extension of the Blue Line. The Red Line is funded 48 percent by the federal government and 15 percent by state government rail bonds; there is zero chance that these funds would be given back, especially because the nonlocal funds have been spent first. Different projects have different supporters on the LAMTA Board, and they are pushing their favorites as fast as they can on the principle that the more that is spent, the less likely is cancellation.

Could anything be done? The Green Line cannot be stopped, except for the spur to LAX. Rational decision making could result in canceling the Pasadena Line, but the short-run costs would be high. Perhaps the Red Line might be renegotiated; e.g. building the main line out to North Hollywood, but not implementing either the East Los Angeles or the Westside spurs. The heavily subsidized Metrolink could be handed over to the other counties that are the main beneficiaries, but that could lead to a political firestorm. None of these steps is very likely.

But the objections to the rail plan are based not only on its ineffectiveness as a transportation strategy but on the fact that it is seriously underfunded. Although LAMTA continues to make major spending commitments, it is going broke, with little chance of persuading the federal government, the state, the county or the cities to bail it out (in view of their own severe fiscal constraints). The almost inevitable result is that at some stage, probably sooner rather than later, the construction will grind down to a slow crawl, if not a complete stop. The irony of the situation is that the shuttle component of our plan could be implemented almost immediately, while even the hardware component (the HOV/HOT lanes) could be built much more quickly than the rail lines.

Yet, to show what is at stake, we have attempted to calculate the savings that could be made available from various rail line cancellations (Table 3). LAMTA data on subsidies per passenger for its four principal modes are shown in Figure 5. Blue Line subsidies per passenger are reported at \$11.34 (\$8.27 in capital subsidies; \$3.07 in operating subsidies). The Red Line subsidies shown in Figure 5 are projections and should not be taken seriously since they are impossibly low; Pickrell's data show that heavy rail costs are usually higher than light rail costs. Using the relative costs reported by Pickrell, local heavy rail subsidies would be closer to \$12.48 per boarding (\$8.52 capital and \$3.96 operating). Applying these to available ridership forecasts illustrates the savings that could be obtained

by deleting various elements of the planned rail system. For example, ridership forecasts by SCRTD (from its *Transit Now* report, 1991) are available for eleven increments of the system (not including elements of Metrolink). Using a 40-year time horizon to calculate savings and presuming that the Green Line, the Blue Line to Pasadena and the three Red Line extensions currently under construction are unstoppable, canceling the rest could save \$34.43 billion (not discounted, see Table 3). Even more could be saved if the Metrolink system could also be canceled (and replaced by express buses on transitways). The *completed* Metrolink system is expected to serve just 20,000 riders per day. Using LAMTA's cost estimate of \$21.2 per boarding and assuming a 40-year life span, a total of \$5.43 billion (not discounted), is at stake.

Compared to existing plans, our counterplan then calls for an additional \$16.3 billion to be spent on transitways, while \$39.86 billion (\$34.43 + \$5.43 billion) would be saved via rail cancellations. Approximately \$100 billion in total revenues would be earned from congestion pricing. Over 40 years, taxpayers would be ahead by \$123.56 billion (see Table 4).

The key point, however, is that the number of riders served via our proposal would be much greater than via the existing plans. And there are other benefits, as well. These include:

- i) higher average speeds and reduced traffic congestion;
- ii) the probability of reduced air pollution accompanying switches of mode and time of day of travel, due to congestion

pricing;
and

iii) entry-level entrepreneurial opportunities in shuttle van operations as a result of deregulation (at least

NET TAXPAYER SAVINGS FROM COUNTERPLAN* (\$ BILLIONS)	
<u>New Revenues</u>	
Congestion Pricing (\$2.5 billion/year)	\$100.00
<u>Cost Savings (capital and operating)—Rail Cancellations</u>	
Red Line additions	\$30.19
Blue Line additions	\$4.24
Metrolink	<u>\$5.43</u>
	Subtotal \$139.86
<u>Added Costs—Transitways</u>	<u>-\$16.30</u>
Net Taxpayer Savings	\$123.56

125,000 jobs for drivers, alone, assuming just one driver per van, plus additional jobs for dispatchers, administrators, and maintenance workers).

VI. CONCLUSIONS

Current transportation plans for Southern California are not cost-effective. A counterplan based on deregulation of shuttle vans and taxis and congestion pricing on HOT/HOV lanes (with many of these also serving as transitways) would cost much less and serve many more. In particular, the impact on solo driving would be much more dramatic. Elements of the proposals are so promising that they offer realistic prospects for privatization and joint public-private operations with substantial taxpayer savings.

In addition, the individual elements of the proposal are complementary to the extent that their simultaneous introduction augments the cost-effectiveness of each.

- 1) Deregulation and expanded taxi and shuttle use would increase the use of dedicated lanes.
- 2) The presence of these lanes would make these shared ride modes more attractive.
- 3) Systems of lanes that the most congestion-averse drivers can buy into would increase the use of these rights-of-way.
- 4) It would also make the introduction of pricing a politically viable option because priced routes would in all cases be paralleled by "free" routes.
- 5) Expanded transit service (especially in the form of more shuttles and vans on uncongested lanes) would also enhance the acceptability of pricing.
- 6) The bus system would benefit from peak-load shedding onto the shuttles and vans (undermining the capacity advantages claimed by rail transit advocates).
- 7) The revenues from pricing could finance transitway construction, allowing reduction or elimination of the current dedicated sales (and other) taxes.
- 8) Smoother flowing traffic would increase the operating speeds of all forms of transit.

These approaches should, of course, be supplemented by the most cost-effective of the conventional transportation demand management (TDM) schemes that are either already implemented or on planners' drawing boards. These include the rational pricing of parking spaces and inducements to telecommuting and flextime. On the transportation systems management (TSM) side, enhanced freeway accident removal capabilities, strategic placement of new highway capacity, better use of existing surface arterials by the creation of urban "clearways," and the improved synchronization of traffic signals are some of the possibilities. Clearly, there are many initiatives to be evaluated; most would complement the twin proposals of pricing and deregulation which should become the foundations of an alternative transportation plan for the region.

The program would require substantial public-private cooperation and coordination to make it completely effective. LAMTA would take the lead role in bringing about the required shift from rail transit to buses, and this would demand major changes in their mindset. Both Caltrans and private road developers (operating under very long-term franchises) would build and operate the HOV/HOT lanes. The shuttle van services would be developed and operated by the private sector, probably with a mix of large- and small-scale operators. The industry would be a major job creator, and would be run on a

competitive basis, although there might be some initial user-side subsidies, in the form of "shuttle stamps" (analogous to food stamps) for low-income patrons. SCAG would continue to retain its regional transportation planning functions, and AQMD would maintain its oversight functions with respect to air quality. Although it would require detailed study to quantify, our alternative plan would have a more favorable impact on the region's air quality than the rail-dominated plan. The reasons are that our plan achieves much more in terms of higher vehicle-occupancy levels and has prospects for beneficial effects on vehicle speeds and traffic flow. The rail plan, on the other hand, has little impact on solo driving and congestion because of low ridership and modest trip diversions from the automobile.

Southern California politicians and transportation planners have embarked on a course that can only end in disaster. With the tempting lure of initial federal subsidies and the acquiescence of deceived voters, they are building a transportation system that will not work, that cannot work. Regardless of how low the fares charged, regardless of how many competing but cost-effective bus lines are closed down, regardless of how strong the efforts and land-use zoning changes to force new development (both residential and commercial) close to the stations, regardless of what additional sacrifices we are forced to make to bridge the rail budget shortfalls, this metropolitan region did not develop with a spatial structure compatible with fixed rail. Nothing can change this. There is insufficient potential to cut door-to-door rail travel times for enough people either to reduce the ballooning subsidies to manageable proportions or to relieve congestion on the highway system. In other words, we are spending billions and billions for minimal gains, if any. It is particularly ironic that lavish rail spending is continuing in times of extreme fiscal penury. If we consider the areas of public expenditure starved of resources (e.g. education, criminal justice, affordable housing, community health), and step back and look at the overall allocation of public fiscal resources from the perspective of maximizing social welfare, the scale of spending on rail not only appears irrational; it is irresponsible.

Although it is too late to shout "Stop the train, we want to get off!," this paper has outlined an alternative that can slow it down. While it is inconceivable that federal monies will be returned, and hence closing down the rail projects altogether will not happen, we believe that limiting the Red Line to the Downtown-North Hollywood link and stopping light rail after the opening of the Green Line is a sensible strategy. The alternative approach that we favor would cost far less, would improve the mobility of millions rather than thousands (as a result of the regionwide system of HOV/HOT lanes), would stimulate private-sector transportation initiatives (in the form of investment in shuttle services), and generate substantial revenues for transportation and other purposes. Further, it would not preserve and expand (rather than risk gutting) the bus system. And the favorable impacts on congestion and air quality would be more substantial than under the rail plan.

For all these reasons, the Counterplan we have offered deserves a serious hearing.

ABOUT THE AUTHORS

Peter Gordon is Dean of the School of Urban and Regional Planning at the University of Southern California and a professor in both the School of Planning and the Department of Economics. He has consulted for a number of international agencies, government departments, and private groups. He earned his Ph.D. from the University of Pennsylvania.

Harry W. Richardson is professor of economics and planning at the University of Southern California. He served as president of the Western Regional Science Association in 1988–89 and is currently associate editor of *African Urban Quarterly* and an editorial board member of *Regional Studies*. His current work involves economic impact models such as the Southern California Planning Model.

ENDNOTES

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19. Bill Boyarsky, "The MTA: New Mecca for Lobbyists," *Los Angeles Times*, September 1, 1993.
20. Patricia Harrington and Kathleen Bradley, *National Transportation Statistics Annual Report*, United States DOT/Research and Special Programs Administration, Cambridge, (1992).
21. Transit advocates in Los Angeles county point to ballot measures in 1980 and 1990 where majorities of voters approved sales tax increases devoted to expanded transit service. What they do not mention is the fact that few people vote. In the last four nonpresidential elections, an average of 63.3 percent of those eligible reported that they were registered to vote; an average of 46.4 percent of those registered claimed to have voted (*Statistical Abstract of the United States 1992*, Bureau of the Census, p. 269, Table No. 435). In addition, it is well known that even the relatively few that do vote do not cast votes for all candidates and measures on the ballot. Even those that do vote have economic reasons to remain less than fully informed ("rational ignorance"). This means that less than 30 percent of the eligible actually voted. A win could have been scored by attracting the votes of just 15 percent of those eligible. It is usually the case that interest group partisans make up a significant proportion of small voting groups.
22. As of April 1, 1993, the Los Angeles County's Southern California Rapid Transit District (formerly in charge of transit operations) and the County's Transportation Commission (which was in charge of funding oversight) were merged as the Los Angeles County Metropolitan Transportation Authority.
23. These amounts are from the Commission's "Fundable Plan" (described in its "LACTC Proposed 30-Year Integrated Transportation Plan," March 1992). Their document also mentions an "Expanded Plan" which assumes that "reasonable revenue increases" will be forthcoming, including a new federal gasoline tax. Beyond that, there are allusions to an "Unconstrained Plan" which "includes all potential transportation improvements identified for the County." The reference adds that, "No resource constraints are assumed, and no analysis of costs and revenues has been conducted," p. 67.
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30. Some of the effects of these shifts can be seen in the security costs per passenger on the Blue Line vs. the bus system: the Blue Line's operating costs included about \$15.2 million for security while just \$13.5 million was spent on the 2,000 buses; this amounts to just over 3 cents per boarding on the bus system and \$1.29 per boarding on the Blue Line.
31. "A Look at the Los Angeles County Metropolitan Transportation Authority," internal audit conducted by Controller-Treasurer Thomas A. Rubin, (1993) p. 7, and accompanying chart. The internal study notes that, "because Express and Local service have very different operating characteristics, it is generally not meaningful to compare ratios between the two service types." Using this differentiation, it is possible to compare LAMTA's cost per revenue hour for local service (\$79.95) with that of Santa Monica local service (\$48.72), LADOT local service (\$25.71). LADOT Commuter Express has costs per revenue hour of \$62.91.
32. Gordon J. Fielding and Daniel B. Klein, "How to Franchise Highways," *Journal of Transportation Economics and Policy*, (1993).
33. John F. Kain, "The Impacts of Congestion Pricing on Transit and Carpool Demand and Supply" Presented at Symposium for the Study on Urban Transportation Congestion Pricing, National Research Council, Washington D.C., (1993).
34. Kenneth Small has pointed out that roadway pricing, if *fully* implemented, would reduce congestion to levels where HOV lanes would lose their appeal. He recommends that these lanes then revert to general use. Our alternative proposal hinges on the gradual introduction of (rather than across-the-board) pricing and would not offer this advantage. Besides the HOT lanes, other routes for the demonstration of peak-hour pricing could include the new private tollways now being built in Orange County. The first of these is being added on the median strip of the SR 91 Riverside Freeway. The private group operating the facilities plans to implement peak-hour pricing as well as offering low-priced access to shared-ride vehicles.
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37. Texas Transportation Institute, "The Status and Effectiveness of the Houston Transitway System," Department of Transportation Research Report 1146-2, Federal Highway Administration, (1989).
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 40. Barton-Aschman Associates, Inc., "Development of a Regional Intercounty Bus Service Program," (1992), p. vi.
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 47. *Ibid.*
 48. Greig Harvey, "Travel Impacts of Congestion Pricing," Presented at Symposium for the Study on Urban Transportation Congestion Pricing, National Research Council, Washington D.C., (1993).
 49. Kenneth Small, "International Survey of Roadway Pricing," presented at University of Southern California, Urban Economics Group Workshop, October 29, 1993.
 50. By comparison, current I-10 bus lines operated by LAMTA serve approximately 32,000 boardings per day. Approximate taxpayer costs per boarding (net of fares) are \$2.20. Assuming that this represents one-half of bus costs (because other non-LAMTA operators also use the busway), annual costs are about \$38.75 million.
 51. The only other rail transit projects under consideration in this region, in Orange County, have not yet been adopted.

Table 3

POTENTIAL SAVINGS FROM LAMTA RAIL LINE CANCELLATIONS
(listed in order of scheduled construction; cancellation candidates above double border)

Line	30-Year Plan Daily Systemwide Ridership Forecast*		Daily Subsidy**	Cumulative Costs (\$billions)** *
	Light Rail	Heavy Rail		
Red Line Extension to Canoga Park	31,627	74,889	\$1,293,265	\$16.71
Red Line Extension to Westwood	---	5,202	\$64,717	\$17.55
Red Line Extension to Century City and Whittier/Atlantic	13,109	33,947	\$572,315	\$24.95
Blue Line CBD Connector	30,018	(2,532)	\$308,805	\$28.94
Blue Line to Exposition Park	737	957	\$20,052	\$29.19
Red Line Extension to Pico/San Vicente, East L.A., Van Nuys	(1,961)	34,275	\$405,514	\$34.43
Red Line Extension to North Hollywood	430	15,560	\$199,065	\$37.01
Red Line Extension to Hollywood/Vine	1,233	38,483	\$494,243	\$43.40
Red Line Extension to Wilshire/Western	(323)	21,773	\$268,074	\$46.86
Blue Line to Pasadena	16,578	1,218	\$169,176	\$49.04
Green Line	(2,673)	30,579	\$313,407	\$53.10

* *Transit Now* analysis by Keith L. Killough, LAMTA. These are now being updated by LAMTA but are the only ones available now.

**\$11.34 per boarding for light rail, from LAMTA's experience with the Blue Line; \$12.48 for heavy rail, reflecting Pickrell's documentation of the difference between heavy rail and light rail per passenger costs.

*** At 323 days per year, same as the standard LAMTA assumption for rail.

- Kenneth Small's Southern California Case Study is based on 15 cents per mile charges applied to "peak VMT." He projects that the resulting 5 percent reduction of VMT would generate annual revenues of \$3,120 million. These would be returned to taxpayers in the three ways mentioned below. Small also traces the impacts that his plan would have on various "prototypical resident" groups. He concludes that, "... most of the adverse effects of congestion pricing can be offset, for most commuters...." The HOT lane proposal would also generate revenues, though considerably less. Nevertheless, the amounts raised must be allocated astutely so as to promote political acceptability.

Small has published a detailed analysis showing the extent to which pricing on congested routes would generate enough revenue to more than offset any losses to drivers. Specifically, there would be: a) monetary reimbursements to travelers (including employee commuting allowances to be distributed by employers and rebates on some vehicle license fees and reduced fuel taxes); b) a reduction of some of the general taxes (including reduced dedicated sales taxes and rebates of property taxes) that now pay for transportation services; and c) new transportation (including highways and transit and other) services. The latter might include government services to business in congested areas that would be impacted by peak-load pricing. Small utilizes the Environmental Defense Fund assumption that travelers are willing to pay 15 cents per peak-hour vehicle mile to travel at free-flow conditions; he assumes that 4.8 billion VMT are removed from the system while 2.4 billion VMT are shifted to less congested times. He also assumes that toll collection costs are 6.6 cents per average 10-mile trip. Kenneth Small, "Using the Revenues from Congestion Pricing," *Transportation*, 19, (1992).

- *Ibid.*