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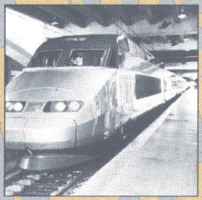
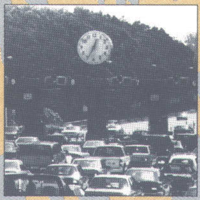
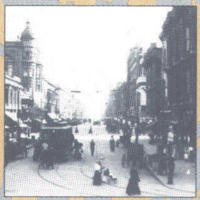

Research at the University of California Transportation Center

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Introduction

It seems that transportation planners everywhere are looking for ways of reducing vehicle miles of travel (VMT) by automobile, even as citizens seem determined to drive more. The trend may be especially evident here in California where everyone seems to believe that use of cars is excessive, having conspired to foul the air, congest the highways, provoke traffic accidents, and erode the quality of people's lives. In response, a lot of creative remedies have been invented—schemes to entice travelers into carpools and public transit and schemes to induce them to stay home.

ACCESS has been reporting on several of these, including the economists' pet formula for reducing VMT by pricing travel at closer to its true cost. Congestion pricing and parking pricing have been gaining considerable attention of late. So have proposals for raising gas taxes to levels that Europeans find tolerable. So have proposals for telecommuting. So have proposals for inter- and intra-metropolitan rail lines.

In this issue of ACCESS, Peter Hall and Adib Kanafani debate the merits of installing a contemporary high-speed railroad between Los Angeles and San Francisco. The basic technology is 180 years old and most Americans have long since abandoned passenger trains for cars and planes. Nevertheless, many now see the new high-speed TGV from France and Shinkansen from Japan as the very models of modernity and as potential means for lowering VMT. Indeed, Governor Wilson has decreed that such a line will be constructed. Hall and his students have conducted detailed studies into the feasibility of a TGV link between L.A. and the Bay Area, and their conclusions lead them to optimistic projections of its success. Independently, Kanafani and his students have been conducting parallel studies focusing on the competition between airlines and rail lines along that route. They suspect that rails will fail.

Martin Wachs has been chairing a Transportation Research Board committee that is assessing congestion pricing as a medium for lowering VMT, and those deliberations seem to have turned him into a skeptic. Here he shares his private doubts with the rest of us, concluding that such a large policy shift is politically implausible.

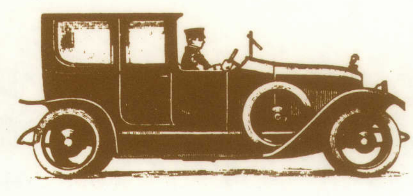
At the same time, ever the optimist, Donald Shoup here extends his scheme for pricing-out employer-paid parking, an idea he discussed in ACCESS a year ago. That plan has now been written into California law and was recently adopted by President Clinton. Now he's suggesting that municipal governments reduce off-street parking requirements for new developments and that they control parking demand by charging market prices for curb space. He calls on neighborhoods to go into the parking business—to organize themselves as parking districts, rent their curb lanes to outsiders, and then capture the revenues exclusively for neighborhood improvements. A rather ingenious marketing idea that some entrepreneurial cities just might adopt.

In an effort to lower VMT by making public transit more attractive to motorists, Anastasia Loukaitou-Sideris has been examining the routes that buses follow through our cities. She finds the social and physical environments along transit corridors to be conspicuously unfriendly to potential riders—that they're typically ugly, crime ridden, and barren of the civic life that once marked these streets. She concludes that the decline in transit riding is unlikely to reverse unless these abandoned corridors can again become the cities' life-supporting arteries and thus attractive to pedestrians. She urges transit agencies to become active, once again, not only as transit operators but also as community developers.

And then, Charles Lave, our in-house oracle, draws on some hard data to explode the soft myth that Californians have an inordinate love affair with automobiles. No doubt to everyone's surprise, he finds that the oft-told tales of Californians' addiction to cars is but fabricated fantasy. It turns out that we here own fewer cars, drive less, use transit more, and in other ways are more "environmentally correct" than the rest of Americans.

So, if VMT in California is lower than the U.S. average, why is everyone making such a fuss about reducing it?

M.M.Webber



Time Again for Rail?

BY PETER HALL

This is the age of the train: certainly in Japan and in Europe; probably, soon, on the East Coast. The urgent question is whether California will catch the train, whether indeed it should catch the train, and if so how.

Modern high-speed train travel involves trains that achieve sustained high speed—a minimum of 125 mph, a maximum in revenue service so far of 187 mph—between cities that are typically between 100 and 500 miles apart. It all began exactly thirty years ago, when the Japanese opened their Tokaido Shinkansen between Tokyo and Osaka. It took nearly another two decades before France followed suit with its TGV (Train à Grande Vitesse) over the 270 miles between Paris and Lyon in 1981. But since then, high-speed trains have proliferated. ➢

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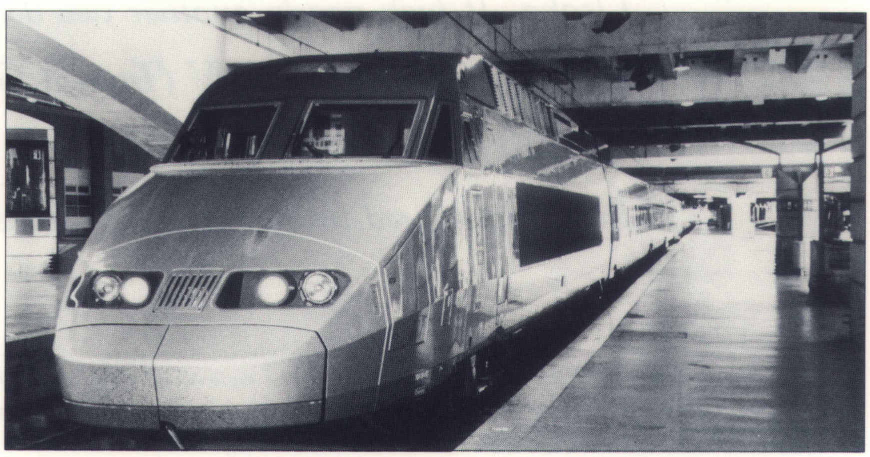
In 1990-91 the French opened a second line, the *Atlantique* between Paris and the Atlantic coast, running at 187 mph in regular service. In 1993 a third, the north line between Paris and the Channel coast opened; it will link to the Channel Tunnel when the latter opens this summer.

Germany has its Inter-City Express linking Hamburg and Munich at speeds up to 155 mph; Sweden its X-2000 tilt train; Britain, Spain, and Italy also have high-speed trains; and Europe firmly plans a network which in twenty years will link all the continent's major cities.

Meanwhile, back home in the United States, there isn't one single mile of true high-speed rail. The nearest is the East Coast Metroliner, which is now slower than two decades ago but is about to receive a major upgrade. Texas plans a TGV system linking Dallas–Fort Worth, Houston, and San Antonio, but major funding problems have surfaced since Morrison-Knudsen pulled out of the consortium. There is no firm proposal for California, even though prospects here are better than almost anywhere else. But now, Governor Pete Wilson has appointed a high-speed rail commission, which began work at the end of last year to produce a blueprint for a system.

So it was fortuitous that a group of us at the Berkeley campus had just conducted an independent assessment of prospects, coming out of a two-year study. First, we made a systematic technical and commercial evaluation of the main Japanese and European contenders: the Shinkansen, the TGV, the German Inter-City Express, the Italian and Swedish versions of tilt trains, and the British InterCity services, together with German and Japanese versions of magnetic levitation (maglev) technology. All the regular steel-wheel systems are in regular revenue service, for periods ranging from one to thirty years; the two maglev systems are still in the test-track stage.

Our firm conclusion from this first phase of the study was that if California needs to take a decision now, traditional steel-wheel technology is preferable to maglev, for two main reasons: it is proven in revenue service, extending to millions of miles in the Japanese and French systems, and it can run on existing rails into downtown stations, without expensive new land acquisition and construction. Further, it can fan out to serve a variety of destinations on existing rails, running at lower speeds, as do both the French and German high-



➢ The French TGV.

The proposed CalSpeed mainline.

speed trains. Thus, the entire system can be built up incrementally, assuring good value for money. The French, for instance, are extending their original South East line from Lyon down the Rhone valley and plan to get it all the way to Marseille by the end of the decade. California could and should use the same approach.

We've specified next-generation, state-of-the-art TGV-type technology, running between the state's cities at up to 220 mph on new, dedicated tracks used exclusively for high-speed passenger service. If that sounds fanciful, the latest French trains are already capable of nearly 200 mph. That does not mean a preemptive decision in favor of French technology: we suggest that there should be an open competition, as in Texas. The Japanese and the Germans are both developing second- or third-generation high-speed systems, which should be able to challenge the French on speed and performance.

Working on that basis, we've surveyed the most promising route options for a California high-speed train system, which we call CalSpeed. It is clear what such a system must do. First and foremost, it must link the two biggest markets in the state, Greater Los Angeles with more than 14 million people and the San Francisco Bay Area with more than 6 million. As one of the busiest air traffic corridors in the world, this is one of the best prospects for high-speed train travel in the United States, and probably in the world. It is not as good as the Japanese Tokaido corridor—nothing is—but it is better than some successful European high-speed corridors such as Paris-Lyon-Marseille. But its commercial success, in competition with the airlines, will critically depend on how fast it can cover the intervening 400 miles.

Because of the need for top speed, the mainline would be a 100 percent new system following the most direct route up the Central Valley, but we also suggest an option: by a diversion of only an extra few minutes, the line could serve the fast-expanding Lancaster-Palmdale area ➢

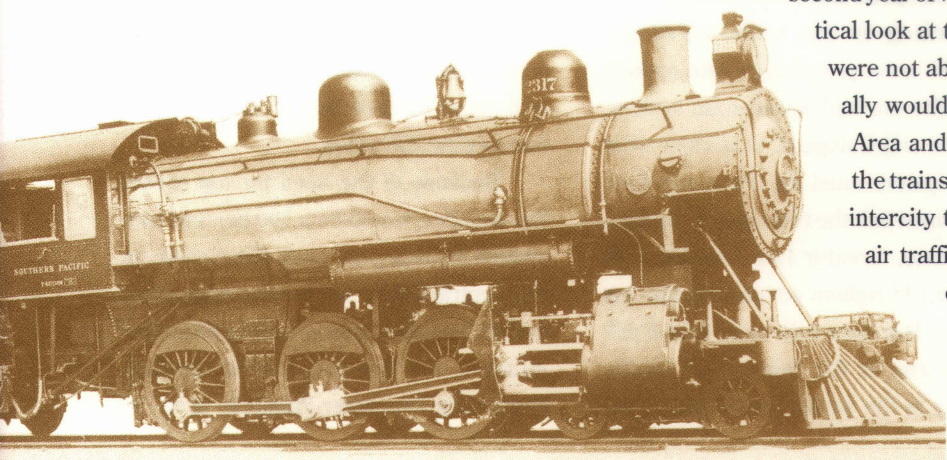
and Bakersfield. This would allow it to avoid the very costly Grapevine crossing of the Tehachapi mountains. North of Fresno, the mainline would throw off a spur to serve the northern central valley communities of Modesto, Stockton, and Sacramento. The mainline itself would enter the Bay Area from the south, so as to serve San Jose and Silicon Valley. At San Jose it would split, one arm going up the peninsula on the existing CalTrain tracks to San Francisco, the other arm using upgraded Amtrak right-of-way up the East Bay to Oakland and on to Sacramento, to form a northern loop.

With such a configuration, our simulations show that trains could make the nonstop run from Los Angeles to San Francisco or Sacramento in less than 3 hours—even though they would be slowed by the need to keep to 100 mph speeds, for environmental reasons, within the urban areas. With Southern California feeders to San Bernardino and Los Angeles International Airport (LAX), and an extension to Orange County and San Diego, the system would serve all the major urban areas of California, effectively accounting for more than 80 percent of the state's 30 million people. And, within these areas, it would penetrate close to where people actually live and work—thus giving it a big advantage over air travel.

So we think that such a system has great potential. Some critics doubt this: they argue that California's metropolitan areas are too extensive, too sprawling, to provide an effective basis for high-speed ground transportation. On the contrary: we think that such large, multicentered agglomerations are almost ideal high-speed territory. Within them, trains could run skip-stop, some running nonstop at maximum speed downtown-to-downtown, others serving intermediate suburban and edge-of-town locations. In the Bay Area, for instance, some trains would run nonstop from downtown San Francisco to Los Angeles; others would make intermediate stops at San Francisco International Airport (SFO), Palo Alto, and San Jose. At these places they would connect with existing and planned urban rail transit systems, to give a seamless web of mass transit which would resemble the best European systems.

Again, some experts think that California's topography is too harsh for effective rail operation. But Italy and Switzerland both operate effective rail service; Italy and France together plan to pierce the Alps for high-speed service between Paris and Turin. The French TGV is quite capable of running on gradients of 3.5 percent, and it's safe at that speed. With such a profile the Californian system could actually be built without the need for many long or costly tunnels, at a cost of around $11 billion.

But we do not want to act as PR agents for high-speed rail. On the contrary. In our second year of work, we have been conducting a hard-nosed, even skeptical look at the market prospects. Because funds were limited, we were not able to undertake the elaborate market surveys that ideally would have been conducted. But passenger surveys in Bay Area and Southern California airports lead us to conclude that the trains could win perhaps a slightly larger share of California's intercity traffic than would air. The projected shares of current air traffic from the Bay Area to L.A. in 2010 are: auto, 69 percent; high-speed train, 17 percent; air, 14 percent. The



baseline forecast for the San Francisco–L.A. sector is nearly 7.0 million passengers by 2010. A less frequent service would have only a marginal effect on this projection; a higher fare could cut ridership by as much as 20 percent.

In arriving at this figure, because of the long and sorry history of over-enthusiastic forecasts, we have taken great care to underestimate the potential traffic. For instance, the projection deliberately ignores the rail potential for shorter journeys, like San Jose to San Francisco, which would mainly be won from automobile commuters. High-speed rail commuting, within the 50- to 100-mile range, is one of the most promising market prospects for rail in California, but it's one that has so far gone unestimated. When the California economy recovers from the current recession, rail could serve new Central Valley communities between Sacramento and Stockton, or in the Palmdale area, offering their residents the prospect of fast, comfortable rides to downtown offices.

Again, the projection completely ignores newly induced traffic, which other studies suggest could represent anything between 5 percent and 30 percent on top. And it deliberately takes no account of the potential of the shorter-distance feeders in our proposed network, such as the Capitol Corridor between Sacramento, West Oakland, and San Jose. If the present line were upgraded and electrified, high-speed trains could run on it, providing direct service from the East Bay to Southern California. This might give a big increase in service level to some communities, such as the North Bay, which at present suffer from poor accessibility to Bay Area airports.

The critics doubtless will argue that, even so, our projections are optimistic because they do not account for the likely price war that would follow the opening of any high-speed rail system in California. California now enjoys one of the world's most completely deregulated and fiercely competitive air markets, with a particularly gungho player in the form of Southwest Airlines. This is true, but all the evidence suggests that as a result airlines' profit margins are cut to the bone. They simply do not have the capacity for a sustained price war. So, if the projection looks good on the basis of the present price structure, it should be pretty robust for the future. The only factor that might alter that is higher airline efficiency arising from a shift to wide-bodied jets on the California shuttle services; but on present loadings, it would be impossible to do that and still offer the current frequency. And, if rail takes a substantial traffic share, that would further delay the incentive to introduce 767s, or their successors, on the SFO-LAX service.

The final stage of our work for the commission involved looking at alternative visions of high-speed rail service for California. In particular, we studied a series of rail corridors between major cities, to see how they could be upgraded for high-speed services and what the costs might be. The upgrade would take these lines up to a best-case performance level of 125 mph diesel-hauled trains, equivalent to those now running on the British InterCity services. It could prove an effective answer for some of the less heavily trafficked routes, although it is doubtful whether it could ever provide a cost-effective answer for the San Francisco–L.A. core route.

For the future, California will need much more detailed, rigorous, and therefore costly studies—above all, of the market potential for the network. High-speed rail should be able to provide a commercial service competing effectively and fairly with airlines and with cars. It should not and need not be a subsidized technological white elephant. Experience in Japan and Europe provides abundant evidence for that. ◆

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NO RUSH TO CATCH THE TRAIN

BY ADIB KANAFANI

There is little doubt that a high-speed rail line could be built in the California corridor, connecting San Francisco and Los Angeles. To be sure some major obstacles must be reckoned with. It will have to cross the Tehachapi Mountains directly, if it's to keep travel time under control. This means some extensive and expensive tunneling. The large, low-density, and expansive metropolitan regions of the Los Angeles Basin and the San Francisco Bay Area will have to be penetrated by an exclusive, grade-separated rail system, which will also require some extensive urban construction. Nontechnical but equally tough obstacles would include possible opposition by communities along the corridor, especially in rural areas where the high-speed line would cut through but not serve.

Notwithstanding these obstacles, it's fair to say that if we decided to build such a system, it ***could*** be built; and it could become a showcase of technological advancement. A high-speed rail system would permit passengers to ride in comfort for a journey between the two metropolitan regions, taking anywhere between three and five hours door to door. The rail line could carry as many passengers per hour as about 100 corridor flights, could consume about a third of the energy per passenger-mile that air or automobile trips use, and could generate only about a fifth of the automobile's emissions and half those of air trips. According to its advocates, it could do all this at fares comparable to nondiscounted airfares, generating sufficient revenues to cover its operating costs and to service the debts incurred in its construction.

Isn't such a sure bet long overdue? Shouldn't the decision to go ahead be an easy one?

The serious answers to these questions are far less optimistic than the rosy promises made for the system, mostly because all the promised virtues of high-speed rail depend on one crucial unknown: ridership and market share. While it is true that trains could carry people at a fraction of the environmental and energy costs of other modes, there is nothing more costly than running trains that are not full. As many urban public transit systems in the United States have demonstrated painfully, the promises of economic and environmental efficiency vanish with low load factors. Without enough passengers the system will not cover its costs. It could become a burden on public funds and end up as one of the most unfortunate transportation planning disasters of this century.

Given the critical importance of market share, it's important to examine the experience of modern high-speed rail systems where they have been tried—in Europe and Japan. Especially in light of the strong role played by air transportation in the California corridor, it's important to appraise rail's ability to complement and compete with air, as well as with highway transportation. ➢

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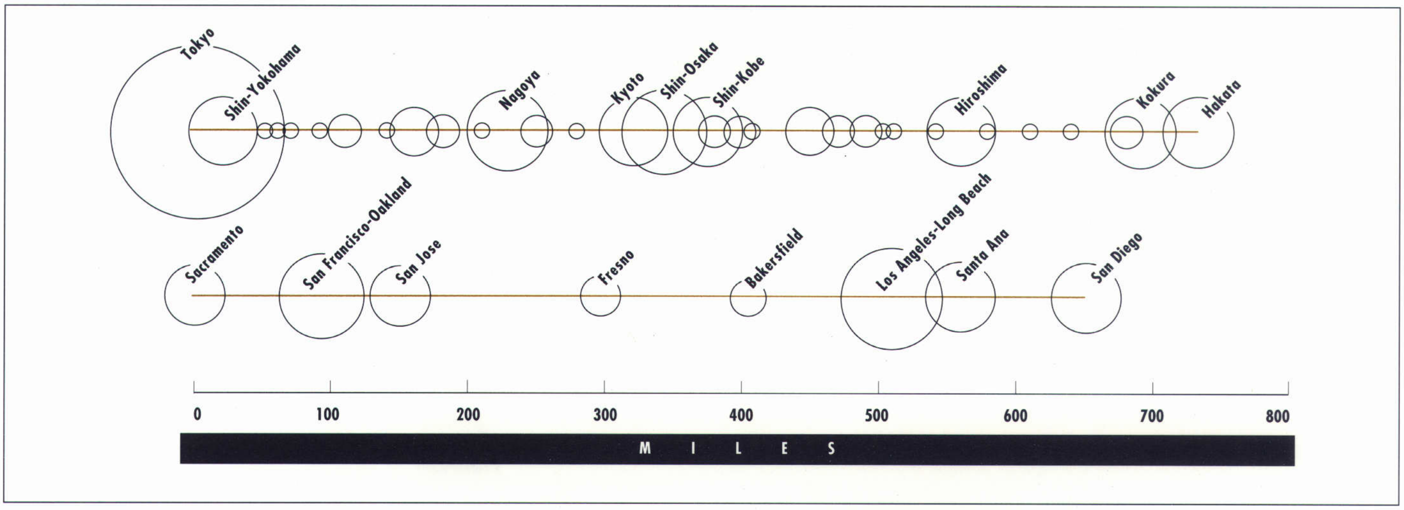
Samuel B. Reed,
General Superintendent
and Engineer of Construction,
Union Pacific Railroad,
at the turn of the century.

POPULATION CLUSTERS ALONG RAIL CORRIDORS IN JAPAN AND CALIFORNIA



The high-speed rail corridor in Japan is characterized by a near even distribution of cities with large populations. In contrast, the California corridor has two highly populated regions with very little in between.

INGREDIENTS FOR SUCCESS

Five conditions are essential for the successful operation of high-speed rail technology. These five are not mutually exclusive, nor must they all be present to assure high-speed rail's success. But each is a critical determinant of success.

1. *Concentrated Demand:* High-speed rail requires strong economies-of-density that, in turn, depend on concentrated population centers to generate the needed passengers. This ingredient is most prominent in the Japanese high-speed rail corridor between Tokyo in the north and Hakata in the south.

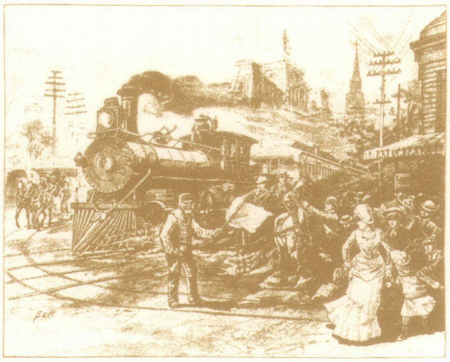
The total population in that corridor is more than 70 million, with the Tokyo-Yokohama region alone containing more than 30 million people—nearly the entire population of California. It is enlightening to compare the California and the Japanese corridors for the magnitudes and locations of their population centers. California has a much smaller market, having a much smaller population within the corridor, 24 million compared to 70 million. Furthermore, California has a bi-polar distribution with more than 95 percent of the total population concentrated at the ends of the corridor. In contrast, the Japanese high-speed rail corridor contains a nearly continuous conurbation of dense population centers. These differences suggest that a high-speed rail line in California is going to be critically dependent on its ability to compete for trips between the two big metropolitan nodes at Los Angeles and San Francisco (350 miles by air, 425 miles by highway and rail). In contrast the Japanese system serves markets that are separated by much shorter distances. The variety of market distances in that corridor allows the Japanese system to take advantage of skip-stop scheduling and to serve a large number of city pairs without much loss of the economies-of-density.

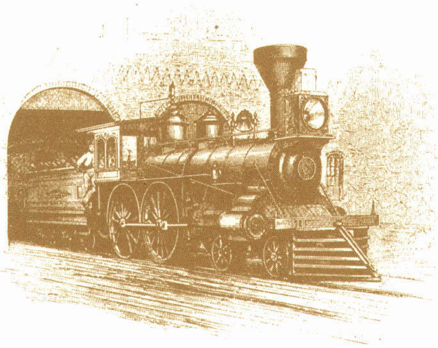
2. *Competitive Time and Money Costs:* Unlike those in Europe and Japan, high-speed rail in California would face two formidable competitors in terms of time and cost: both air and highway travel are relatively cheap in California. Gasoline prices in Europe continute to be three to four times higher than in the United States. Freeway tolls in many European corridors, including those served by the French TGV, are quite high and add significantly to the cost of driving (for example, the toll from Paris to Lyon is about $40). Airfares in Europe are at least twice those in California, and the situation in Japan is even more extreme.

Not only are the costs of air and highway travel much higher in Japan and Europe than they are in California, but so are travel times. European intercity freeways are heavily congested, and many of the corridors served by high-speed rail do not enjoy anywhere near the freeway capacity available in the California corridor. Air travel is also considerably faster in California, where frequent flights provide service with virtually no schedule delay, an important element of time cost in short-haul transportation. (There are currently more than 200 flights per day between Los Angeles and the Bay Area, 70 per hour during the evening peak. Discounted fares today are below $50 per trip, making this the lowest priced corridor in the world.)

If high-speed rail is to compete effectively against these other modes it will have to offer matching services at competitive prices. And in California, high-speed rail needs to be cheaper and faster than the systems in Europe and Japan.

3. *Efficient Local Distribution for Quick Access to the Service*: An essential element of the time competitiveness of the rail system is the collection and distribution necessary at the ends of the line-haul service. Like air transportation, rail requires major infrastructure for intermodal transfers, and it depends on an effective distribution system to provide quick access to and egress from its terminals. This factor plays against rail in California as compared to Europe and Japan in three ways. First, California's urban areas to be connected by rail are much less dense than those in either Europe or Japan. Second, local distribution systems in California are not as well connected. For example, TGV connections in Paris stations coincide with those of two local distribution systems — the Paris Metro and the regional RER train system. These bring the whole metropolitan region within easy access of the TGV line. In contrast a high-speed rail terminal in the San Francisco Bay Area would be connecting to a disjointed, less efficient, and less ubiquitous public transportation system, making it more dependent for its access on congested urban freeways. Third, the abundance of competing airports in the California corridor presents rail with additional challenges not faced in Europe and Japan. With the San Francisco Bay Area served by three and the Los Angeles Basin by five airports, there is no reason to believe that access to rail stations is likely to be any easier than to airports. Given the line-haul speed disadvantage of rail when compared with air, the rail system is going to have to provide significantly better access if it's to be competitive. ➢





4. *Network Effects:* Unless population densities along the corridor are high, as in Japan, traffic between the ends of the corridor is not sufficient by itself to sustain a high-speed rail link. The link must be part of a larger, connected rail network. The success of Japan's high-speed rail comes from both the very high population densities and the consequent large demands generated along the corridor and then to the network of public transport connections to off-line cities. In Europe, too, high-speed rail has been successful because cities along the routes are close together and rail networks spread outward from each high-speed station. Thus, end points of the TGV line act as transfer centers, much as airline hubs do. This relationship is illustrated by the traffic figures on the Paris-Lyon line, where only about 5 million of the more than 20 million annual passengers travel between the TGV line's end points; the rest connect to other points in the network. Without feeding into a supportive network, it's doubtful that even the highly successful TGV-*Atlantique* would have survived. Within a four-hour high-speed-rail trip time, the European network encompasses an area with a population of more than 150 million.

California's geography raises serious questions about the potential for network effects. First, the corridor traces through a sparsely populated region, primarily devoted to agriculture, except for the metropolitan developments at either end. The vast distances separating the California corridor from population centers elsewhere, say in Nevada and Arizona, also reduce network possibilities for a rail system, leaving the advantage to air transportation.

5. *Institutions:* California's passenger rail system is currently pretty sparse. To operate a high-speed rail system in California efficiently will require rebuilding institutional capabilities lost in past decades. In Europe and Japan, the institutions that operate and regulate rail transportation managed to implement high-speed rail by gradually and marginally increasing speeds over a period of time. In California, such an incremental approach would pose an institutional challenge that would be difficult to meet within the time horizon envisaged for the system. The danger of proceeding with inadequate institutional infrastructure is that the system will fail to meet its operational goals and consequently fall short of capturing its market share.

HOW TO PROCEED—SLOWLY

Market penetration possibilities in California do not match those in Europe and Japan. TGV captures 90 percent of the traffic between Paris and Lyon, despite its 50-minute line-haul time disadvantage when compared to flight; but so large a market share is wholly unlikely in California. The European intercity transportation system is trimodal, with automobiles dominating over short distances in the range of 120 miles (200 km), rail dominating in the range of 120-360 miles (200-600 km) and air in the range beyond 360 miles (600 km). In California the system tends to be bi-modal, with highway and air between them competitively covering the whole range of distances.

Does this mean that high-speed rail is not a good option for California? Or are there other compelling reasons to build the system nevertheless? Despite the conventional wisdom, congestion is not the reason to build a high-speed train. The intercity transporta-

TRANSEUROPEAN HIGH-SPEED NETWORK (LONG-TERM MASTER PLAN)

tion system in California is not congested, nor is it likely to become so for the reasons discussed above. Congested air space would be minimally influenced by a diversion of traffic to rails because corridor flights represent only a fraction of the traffic at the congested airports (7 percent of Los Angeles International Airport's capacity in 1993!). Besides, passenger traffic can be readily increased without increasing numbers of flights and without losing schedule convenience: simply increase aircraft size.

Perhaps the most convincing argument for rail is its environmental advantages and possible energy efficiency. However, again, these advantages can be gained only if the system is operated at a high enough level of efficiency. That is, enough passengers must be on board to make energy consumption and pollutant emission levels per person per mile less than automobile and airplane levels. What those numbers might be in California, and whether they justify building a high-speed rail remains an open question. ➢

European high-speed rail is successful in part because it relies on a supportive network of cities connected by existing rail. Much of the planned high-speed system will consist of upgraded lines.

Rail might also be seen as an potential means for enhancing accessibility to the intermediate regions within the California corridor. The Central Valley is not adequately served by air transportation, mostly because the commuter air market is not as adaptable and competitive as the rest of the air carrier system. If high-speed rail, or indeed any rail, would effectively generate regional development there, then it may be worthwhile to implement policies to make that technology feasible, including creating subsidies to sustain the technology until it can pay for itself. It may take $4 a gallon for gasoline or $200 in corridor airfares to create a consumer market for high-speed rail. But it seems unlikely that such policies, which have worked to the advantage of rail transportation in Europe and Japan, will ever gain the necessary political support in California.

Many questions remain unanswered and unanswerable with the information we have in hand. We know very little about the total costs of rail, or of other technologies for that matter. There has not been a study of the total social costs of intercity transportation in California. Policy makers cannot even compare the full cost of building the rail system with that of expanding the capacity of alternative modes. Likewise, we know very little about the nature of the demand for intercity transportation in the state.

The decisions to deploy high-speed rail technology in California cannot be rushed. Careful study of important issues is needed to inform public opinion and to support responsible decision making. Therefore, before rushing to build, we must take time for more careful and dispassionate study. ◆

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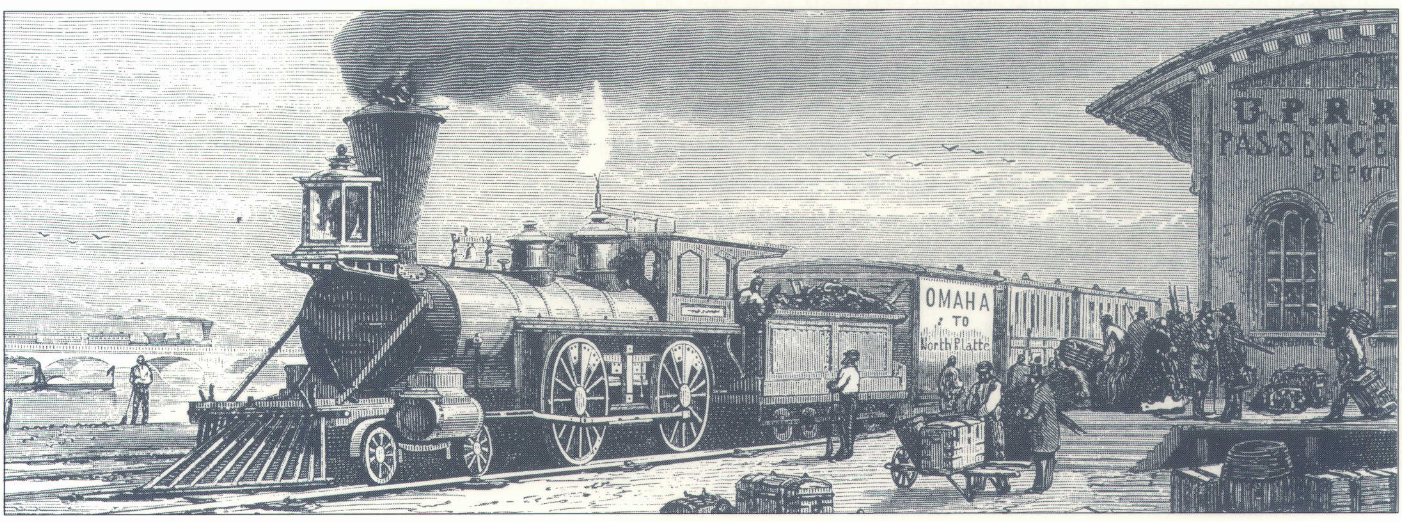

Will Congestion Pricing Ever Be Adopted?

BY MARTIN WACHS

Transportation planners and economists are urging us to adopt congestion pricing—to charge motorists more for driving on crowded roads during rush hours and less for traveling on uncrowded roads in off-peak hours. By putting a price on peak-hour travel, we would encourage motorists to switch to less crowded alternate routes or, better yet, take public transit, join a carpool, or travel at a time of day when the roads are less crowded. Such tolls might even induce some travelers to alter the origins or destinations of their trips or to cancel less important trips, thereby cutting their total amount of auto travel.

In his recent article in ACCESS (Spring 1993), Kenneth Small suggested why the idea of congestion pricing is gaining much more attention today, even though it has been around for decades. In part it's because electronic toll collection now allows us to vary prices on roads by time of day and location without awkward and costly toll booths which themselves slow traffic. Congestion pricing has also become attractive because governments are strapped for funds, and road pricing is potentially a lucrative source of revenue. ➢

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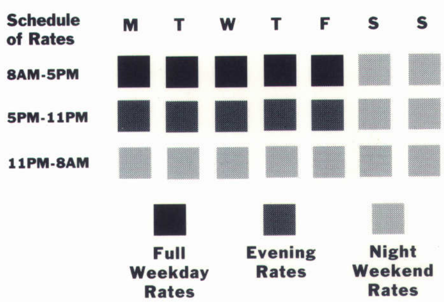
We're used to congestion pricing at movie theaters.



And we avoid long-distance phone calls when possible during the day.

Congestion pricing is a good idea. We know it works, and we readily accept it in other parts of our daily lives: the telephone company has long varied the price of a call by time-of-day and day-of-the-week; airline fares between the East and West Coasts can differ by as much as a thousand dollars depending upon the timing of the trip; many restaurants offer early bird specials and movies give matinee discounts.

Congestion pricing on roads would be fair. It would levy the social costs of driving more directly against those who impose them; it would lead to more efficient use of existing roadway capacity; it would make public transit more economically competitive with driving; and it would produce revenue for public treasuries that could be used for many beneficial transportation and nontransportation purposes. I am persuaded by the evidence that congestion pricing should be applied to our highway system.

Yet, I think the prospects for widespread adoption of congestion pricing are extremely limited. The political realities seem to me to work strongly against widespread adoption, and I think pricing proponents have not analyzed the political obstacles as carefully as they have the technical ones.

The Political Pitfalls

In the American political system most changes are small and most innovations are incremental. Rarely do we entirely overhaul our basic ways of doing things. While everyone agrees, for example, that the health care system needs reform, note how difficult it is to erase the current system and replace it with another. It is much easier to reach consensus on raising the gas tax by a few cents than on replacing the gas tax by congestion tolls.

One reason for this consistent pattern is that proposals for change must pass many political tests. While victory at one level may only ensure that the idea will live long enough to be tested at another level of government, failure at any one level can whisk the idea out of systematic consideration for good. Usually it's only the safer, marginal changes that are supported by so many interests that they pass muster in every test. Entirely new ways of doing business are rarely adopted because their opponents need defeat them only a few times.

New ideas must have tireless and sophisticated proponents who "work the system" in favor of their concepts. Usually, those who do work the system to promote some innovation have a lot to gain from its adoption. For example, highway building and rail transit construction programs benefit from strong lobbies of construction contractors, unions representing construction workers, public agencies whose budgets will swell if the programs are approved, owners of urban real estate at potential station sites, environmentalists, and others.

Who are the proponents of congestion pricing? Is there an obvious constituency of promoters who will lobby at local, regional, state, and federal levels on behalf of this concept? Will they be zealous enough to successfully fight off the dozens of well-established and well-organized vested interests who have already raised questions about congestion pricing? In addition to professors of transportation economics and planning—who hardly constitute a potent political force—I can think of few interest groups that would willingly and vigorously fight for the concept in what will surely become a pitched battle, if ever the idea is seriously proposed.

Downtown businesses might gain from reduced congestion if congestion pricing were adopted, but they might also lose business to outlying areas; so they are hardly likely to rally around the cause. The trucking industry might benefit from lowered congestion, but so far truckers seem more threatened by the charges than they are enticed by congestion relief. Transit agencies may benefit through increased ridership as a result of higher auto costs, but transit is hardly a powerful constituency, representing something like two percent of our national market for tripmaking. Environmentalists might line up for congestion pricing, but they have so far been tentative, and there is even the possibility that higher auto speeds resulting from congestion tolls might increase emissions of oxides of nitrogen.

Congestion pricing constitutes a basic change in the way we charge travelers for transportation services. Although gasoline taxes in a very rough way apportion the costs of roads in proportion to the amount of driving we do, they leave to motorists entirely free choices about when and where to drive. And, many interests will likely line up against changing this. Automobile drivers as represented by automobile clubs, for example, will argue that they have already paid for highways through user fees such as gasoline taxes, and that tolls would constitute paying twice for the same roads. The idea of user fees as devices for rationing road space is both unfamiliar and distasteful to some of these groups.

While economists are confident that higher prices at the peak will cause travel patterns to shift, many lay citizens—including influential political leaders—believe simply that demand for travel is inelastic. Thus, they argue that because people "have to travel" at the peak hour, congestion pricing will merely raise more money from beleaguered motorists who will still be driving under congested conditions. Both theory and a few implemented programs, like that in Singapore, assure some of us that prices can be set at an appropriate level to clear congestion, but how might we persuade the skeptics, unless we can first establish an American demonstration? ➢

Are we ready for time-of-day pricing on roads?

And then, suppose we could create a domestic test project, how would we in practice actually set the price level? Economists tell us that if the price is initially too low to clear congestion it can be raised; if it is initially so high that it causes underutilization of a road's capacity the toll can be lowered. Yet, the press and politicians will be quick to call any imperfection a failure: a price that does not clear congestion will "prove" the idea doesn't work; a toll that creates a half-empty freeway at rush hour will be labeled a foolish waste of public capital investment. The risks of these possible outcomes will cause few veteran politicians to support congestion pricing enthusiastically, and that in turn will make opposing voices seem even louder.

Many, many skeptics have already raised questions of "equity." Congestion tolls will surely impact those who have little discretionary income more than they will the rich. Working mothers may be more likely than other commuters to continue to drive at rush hour, even if they would rather switch travel modes or travel times, because child-care responsibilities place greater limits on their flexibility to shift. Surely, for congestion tolls to work many people must be made worse off than others, by having to change their travel patterns in a way they would rather not. Those groups will undoubtedly consist disproportionately of poorer people, hourly wage workers who have little work-schedule flexibility, and so on.

The direct losses to poorer people could easily be compensated, say the proponents of congestion pricing, by redistributing the revenues to improve transit services, by reducing existing regressive sales and property taxes which are being allocated to transportation programs, and possibly by granting tax credits to the poor who pay congestion tolls. While these arguments are all valid, the negative impacts of the tolls on poor people seem very immediate and direct, and the possibilities of redress by comparison seem

The San Francisco Bay Bridge—a potential site for a congestion pricing experiment.

tentative. While equalizing measures could be adopted, where are the guarantees? Many citizens have little faith in government; they honestly believe that while the increased revenues might be used to redress the inequities, they could just as well be "squandered" by politicians.

I don't believe that the current transportation finance system is at all equitable. Indeed, I believe that reliance upon congestion prices instead of sales and property taxes could make transportation finance much more equitable than it is today. Yet, I hear few complaints about the fairness of the existing system from community spokespersons, while many seem quick to oppose congestion pricing on the grounds of its threat to equity. Many who challenge road pricing on the basis of equity seem to have little concern for the well-being of the poor or of working women when considering other policy initiatives, such as sales tax increases to support the expansion of rail lines. This irony illustrates again the principle that it is harder to introduce a new way of doing things than it is to change marginally the way we do things now.

Future Prospects for Congestion Pricing

In sum, the political risks associated with congestion pricing are great. No obvious political constituency will fight vigorously for the idea, and there are many potential roadblocks to adopting and implementing peak-hour tolls. Although today's traffic congestion results from the mispricing of automobile travel, that seems irrelevant. The only politically prudent course of action, then, is to move slowly and incrementally. Congestion pricing is likely to be adopted in the near future only on new highways or on new lanes along existing highways, such as those now being constructed in Orange County where congestion pricing is to be employed. The concept is less likely to be imposed at a significant scale on any existing urban highways.

Other possible opportunities for testing the concept are on existing toll routes, as on the San Francisco Bay Bridge. Motorists are much more likely to accept congestion pricing in the form of incremental revisions to familiar tolls than peak-hour charges suddenly imposed where tolls don't presently exist. So, I enthusiastically support the congestion-pricing experiment now being carefully designed by the MTC for the Bay Bridge. Proposals allowing solo drivers to buy their way into high-occupancy vehicle lanes offer another incremental step that may have more political appeal than would pure congestion pricing.

Although full-scale regional application of congestion pricing may offer the best attack on congestion in America, I don't believe that approach has the slightest chance of being enacted in the coming decade. Advocates of congestion pricing will have to settle for smaller victories during the foreseeable future. Eventually many small victories could add up to a new approach to highway management and finance, but don't count on it happening any time soon. ◆

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Cashing in on Curb Parking

BY DONALD C. SHOUP

Customs House, Monterey, CA, early 1900s.

Whether you're driving to work, to a doctor's appointment, or to dinner with a friend, you don't want to reach your destination and then circle the neighborhood for 40 minutes looking for a parking space. You want even less to compete with dozens of other cars looking for that same vacant space, while dodging double-parked cars and listening to honking and cursing.

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This essay is adapted from his forthcoming article in the Journal of the American Planning Association.

To prevent just that kind of nightmare, city planners across the country have ordained minimum off-street parking requirements for everything from apartment houses to zoos. They've thought that if the city could assure convenient, free parking, more visitors, employees, and business clients would come into town. Besides, by keeping parked cars off the streets, they could make local residents happy, and they're the ones who vote.

But I believe that planners have seriously misdiagnosed the parking problem. By imposing minimum parking requirements, planners have inadvertently increased automobile dependency and decreased urban density.

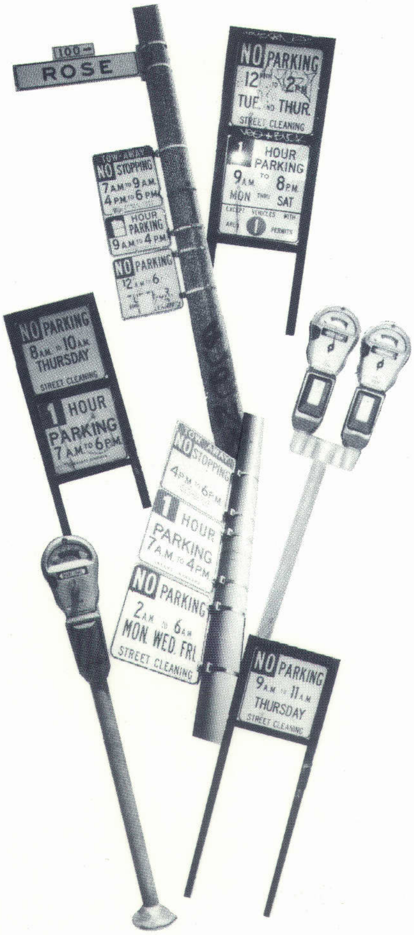
Because parking requirements are based on observing the number of cars parked at existing land uses, and because motorists report paying nothing to park for 99 percent of all trips,[1] parking requirements are implicitly based on the demand observed at a zero price, without regard to either the cost of providing parking spaces or what motorists are willing to pay for them. When all development is required to provide enough parking to satisfy demand at a zero price, the resulting market price will be zero. The consequence is a vicious circle of parking subsidy, required oversupply of parking, and ubiquitous free parking which then leads to an observed "demand" that is used to set future minimum parking requirements.

But if new development doesn't provide sufficient off-street parking to meet the newly created demand, won't parking inevitably spill over onto the neighborhood streets? If nearby curb parking is free, any development that does not provide enough off-street parking to meet the demand at a zero price will cause spillover. I would argue that the spillover problem is not caused by a shortage of off-street parking for all motorists who want to park free. Rather, it is caused by the government's failure to charge an appropriate price for curb parking.

If solving the spillover problem by pricing curb parking were so simple, why wasn't it done long ago? The answer lies, I believe, with what happens to parking meter revenue. Money put into a parking meter seems literally to disappear into thin air. Unless citizens can see how the revenue directly benefits them, why would they support charging for something that used to be free?

To change the political calculus, suppose market prices for curb parking were introduced by creating "Parking Benefit Districts" that differ from existing Residential Parking Permit (RPP) districts in two ways. First, residents would continue to receive permits to park free in their district, but nonresidents would be charged the market price for parking. Second, the resulting revenue would be spent for additional public services in the neighborhood where the revenue is collected, such as for sidewalk and street repair, street tree planting and trimming, street cleaning, street lighting, graffiti removal, or putting overhead utility wires underground.

Spending curb parking revenue in the neighborhood where it is collected would help residents to see themselves as owners, not merely users, of curb parking. Seen from the resident's side of the transaction, charging nonresidents for curb parking and spending the money to benefit the adjacent property resembles Monty Python's scheme to "tax foreigners living abroad." ➢



Where does the revenue from curb parking go?

1 In the 1990 Nationwide Personal Transportation Survey, the 48,400 respondents reported free parking for 99 percent of all their automobile trips.

By creating Parking Benefit Districts, curb parking revenue could be used to beautify streets like this.

A Parking Benefit District represents a compromise between the one extreme of free curb parking that is overused by nonresidents, and the opposite extreme of RPP districts that flatly prohibit nonresident parking. When cities establish conventional RPP districts, they are overlooking some important benefits that a more market-like solution can offer to both residents and nonresidents. A Parking Benefit District offers nonresidents the option of paying a fair market price to park (rather than simply prohibiting them from parking), and it offers residents neighborhood public revenue derived from nonresidents.

Almost every city must have some neighborhoods with broken sidewalks, potholed and treeless streets, or overhead wire blight that could benefit from additional public investment financed by nonresidents' payments for curb parking.

Consider what it means to set a "market price" for curb parking. Traffic engineers usually recommend that at least one in seven curb spaces remain vacant at all times to ensure easy parking access and egress. Thus, the appropriate price for curb parking would limit demand so that at least one in seven spaces remains vacant to accomodate new arrivals. This strategy is not new: all commercial parking operators set prices high enough to maintain vacancies. The last thing a commericial operator ever wants to do is put out the "full" sign, because it means that the price is too low.

Can market-priced curb parking really yield sufficient revenue to make it worth collecting? At a price of fifty cents an hour for only eight hours each weekday, and an 85 percent occupancy rate, one parking space would yield $884 a year. By comparison, the median property tax on single-family houses was $922 a year in 1991. Many single-family neighborhoods have two curb spaces in front of each house. Therefore, even at modest market prices, potential curb parking revenue in neighborhoods subject to spillover parking could easily exceed current property tax revenue.

A neighborhood-generated public land rent that is spent on the neighborhood's own highest public priorities should especially appeal to advocates of greater neighborhood self-government. It may not be easy to decide how to spend a Parking Benefit District's revenue, but Special Assessment Districts, which are already used to finance public projects that specially benefit particular neighborhoods, show there is ample precedent for neighborhood political choice.

Special Assessment Districts are often organized by petition from residents, and it is common for each benefitted property to pay a special assessment in proportion to its street frontage. Indeed, the chief difference between a Special Assessment District and the proposed Parking Benefit District seems to lie in who pays: resident property owners pay special assessments, while nonresident motorists would pay for curb parking. Many cities already use special assessments, so these cities must already have the accounting systems for allocating district-specific revenue to neighborhood public services.

Because anyone parking illegally would be stealing neighborhood public revenues, residents would have a new incentive to cooperate with the police and parking enforcement officers in supporting parking regulations. And if market prices create ubiquitous vacant legal spaces, no one would ever "need" to park illegally by a fire hydrant, in a bus stop, or in a handicap space.

What's more, we now have the technology to do away with having to feed the meter. One particularly promising new system employs a personal in-vehicle parking meter, similar in size and appearance to a small pocket calculator, that operates like a debit card. With this system, motorists pre-pay a municipal authority for a total value of parking that is programmed into their in-vehicle meter. After parking, the motorist keys in the parking zone code, switches on the meter, and leaves it inside the car with its LCD display visible. The motorist does not need to carry coins, and does not suffer the "meter anxiety" associated with conventional parking meters. Cities in California, New York, and Virginia have already begun to use the in-vehicle parking meter, which in Europe is called an "electronic purse." Motorists who have tried them report an overwhelmingly positive response.

The real obstacles to charging market prices for curb parking are political, not technical. The political acceptability of charging for curb parking depends on a politically acceptable distribution of the collected revenue. If each neighborhood's parking revenue were spent for that neighborhood's highest public spending priority, more people would want to charge for curb parking. The purpose of a Parking Benefit District would be to make the neighborhood a place where people want to be, rather than merely a place where anyone can park free. ➢

In-vehicle meters make paying for curb parking easy. (AutoParq by Duncan Industries)

Is It Fair To Charge for Parking?

If people "need" parking, won't pricing it necessarily harm the poor? But the fairness of charging for parking has to be considered in comparison to the alternative, which is "free" parking made possible by minimum parking requirements for all land uses. Parking itself appears to be free, but the cost does not disappear; rather, it reappears as higher costs for all other goods and services, especially housing. A case study from Oakland, California shows how minimum parking requirements reduce the supply and raise the cost of housing. In 1961, Oakland's zoning ordinance began to require one off-street parking space per dwelling unit for all apartments developed after that date. As a result, the number of dwelling units per acre in new developments fell by 30 percent and the construction cost per dwelling unit rose by 18 percent.

Why did developers reduce housing density by 30 percent in response to a minimum parking requirement of one parking space per dwelling unit? First, developers said the requirement made previous densities impossible without expensive underground garages; therefore, they reduced density and devoted more land to surface parking. Second, developers said that *adding* a dwelling unit required another parking space, but *enlarging* a dwelling unit did not; therefore, they built fewer but larger units.

All architects and developers know of similar situations where minimum parking requirements dictate what can be built, what it looks like, and what it costs. Form no longer follows function, or fashion, or even finance; instead, form follows parking requirements.

A tiny fraction of the countless land uses for which parking requirements exist in zoning ordinances. Perhaps the only common element is the assumption that there should be at least one parking space for every person (except for religious land uses).

SELECTED PARKING REQUIREMENTS

LAND USE	MINIMUM PARKING REQUIREMENT
Adult Entertainment	1 parking space per patron plus one space per employee on the largest working shift
Barber	2 parking spaces per barber
Beauty Shop	3 parking spaces per beautician
Bowling Alley	1 parking space for each employee and employer, plus 5 spaces for each alley
Golf Course	10 parking spaces per hole
Heliport	5 parking spaces per touchdown pad
Mausoleum	10 parking spaces per maximum number of interments in a one-hour period
Nunnery	1 parking space per 10 nuns
Rectory	3 parking spaces per 4 clergymen
Swimming Pool	1 parking space per 2,500 gallons of water
Taxi Stand	1 parking space for each employee on the largest shift, plus 1 space per taxi, plus sufficient spaces to accommodate the largest number of visitors that may be expected at any one time

It is doubtful that "free" parking benefits the poor when the hidden costs of the consequent minimum parking requirements are considered. Because the cost of providing the required "free" parking is incorporated into the cost of all other goods and services, parking requirements force the poor to pay for parking regardless of whether or not they own a car. A recent transportation survey in Southern California found that the poorest 20 percent of the population owned only one car for every three persons, while the richest 20 percent owned one car for each person. In this environment, it would be misleading to argue that charging nonresidents for curb parking and reducing off-street parking requirements will harm poor people.

Will It Hurt Small Businesses?

A separate equity issue concerns the fairness of charging market prices for curb parking in areas where small businesses rely on curb parking for their customers. Recall that we want curb-parking prices to yield about an 85 percent occupancy rate. A lower price is called for if there are too many vacancies, and a higher price if there are so few vacancies that motorists must drive around to find a place to park.

Market pricing will not reduce the total number of curb spaces and will encourage a higher turnover rate. Also, those who arrive in higher occupancy vehicles can split any parking charge so their cost per person will be low, and those who stay a short time will pay little even if the price per hour is high. Because market pricing favors higher occupancy vehicles and higher turnover, adjacent businesses should end up with more customers per curb space than when the same spaces are free (and taken by solo drivers who stay longer once they find a spot).

Finally, by allocating the available curb spaces to those who are most willing to pay for them, rather than to those who will come only if parking is free, market-clearing parking prices should attract customers who will spend more in the adjacent businesses per hour they are parked. By delivering more, and higher-spending, customers per curb space, market prices should help rather than harm the adjacent businesses. The resulting revenue will also be available to spend on improving public services in the commercial districts where these businesses are located. ➢

Weaverville, CA, 1940s.

Conclusion

Comprehensive planning is supposed to coordinate individual actions toward a desired overall outcome, but what worthwhile planning goal is achieved by zoning ordinances that effectively remove the cost of parking as any disincentive to automobile ownership or use? Minimum parking requirements in zoning ordinances are like fertility drugs for cars, and they help to explain why the United States now has 1.1 motor vehicles per licensed driver.

When the whole city is considered the patient, minimum parking requirements will never cure traffic congestion, reduce air pollution, decrease energy consumption, or improve urban design. Rather, minimum parking requirements are a harmful addiction masquerading as a cure. When three spaces per 1,000 square feet no longer accommodate the demand for free parking, a stronger dose of four spaces per 1,000 square feet can temporarily quiet the neighbors' complaints, but every jab of the parking needle relieves only the local symptoms, and ultimately worsens the real disease.

The fear of spillover parking is a legitimate but not unanswerable objection to eliminating minimum parking 25 requirements. To deal with spillover parking problems that may occur if cities eliminate parking requirements, I have proposed creating Parking Benefit Districts where the revenues from market-priced curb parking are dedicated to paying for neighborhood public services. At relatively modest parking prices, curb parking revenue could easily exceed the current residential property tax in neighborhoods subject to spillover parking from nearby commercial development.

Eliminating minimum parking requirements will encourage people to do what planners have long exhorted them to do: carpool, ride mass transit, bicycle, or walk. With market prices for curb parking, and a commitment to spend the resulting revenue to benefit the neighborhood where it is collected, spillover parking can become an important source of public revenue, rather than a source of annoyance. That is, spillover parking can be converted into an additional advantage of eliminating inappropriate minimum parking requirements. ◆

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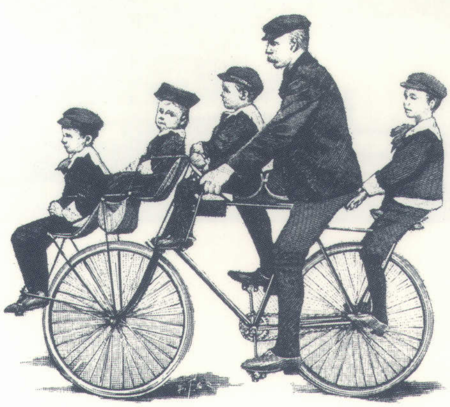
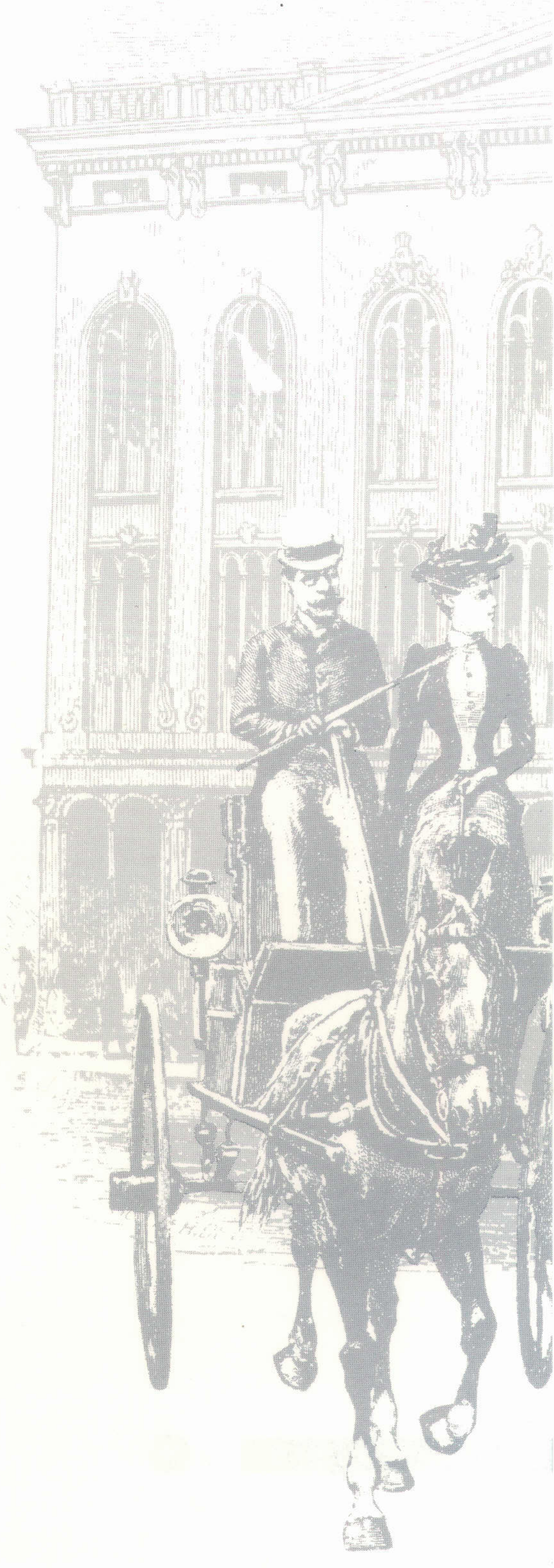


REVIVING TRANSIT CORRIDORS AND TRANSIT RIDING

BY ANASTASIA LOUKAITOU-SIDERIS



When parts of their freeway network were damaged by the recent earthquake, many Los Angelenos were forced to "take to the streets"—to drive on the numerous arterials and transit corridors that interlace the city. They discovered a forgotten commercial landscape of small retail establishments mixed with office and residential buildings, automobile dealerships, junkyards, parking lots, and vacant space. These corridors are not unique. They are typical urban landscapes that can be found in virtually all American cities. Prior to the construction of freeways they were the principal traffic and transit arteries of the city, and they still carry the largest share of transit traffic. Urban arterial corridors are the "in-between" spaces of the city. They connect centers with subcenters, and the latter with one another, in the multicentered urban expanse that is typical of the post-industrial American city. But these transit corridors have become unfriendly to transit riders.

GENESIS AND EVOLUTION OF COMMERCIAL CORRIDORS

Many believe that commercial corridors are products of automobiles. Although the automobile has had dramatic effects on city form, actually the horsecar and later the electric streetcar generated the corridors. The evolution of commercial corridors traces back to the middle of the nineteenth century, when most American cities started to expand rapidly beyond the limits of downtown. Many years before the automobile, alert speculators were erecting commercial buildings along streetcar lines. These commercial establishments served the households that settled along the lines, sparing residents from having to go all the way downtown to shop. ➢

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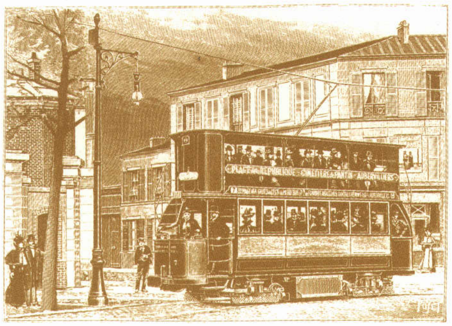


Initially a few stores, churches, and sometimes schools were built to serve the residents. These first commercial establishments outside downtown were modest, consisting of a single row of shop fronts. They were seen as interim improvements, designed to produce enough revenue to pay the taxes and hold the property for more intense development in the future. Hence, these buildings were also referred to as "taxpayers," and the commercial corridors they fronted were called "taxpayer strips." A linear, centerless shopping district—the commercial strip—was evolving.

For businesses, taxpayer strips offered an ideal solution. Rents were lower than downtown, yet many people lived close by. Customers could walk, or even take the electric car to the shops. Strips were less congested than downtown and allowed for more parking near the stores. As the primary access routes that connected downtown to the outlying residential districts, the strips quickly became important and vibrant places for commercial, recreational, and residential activities.

The automobile initially gave a further boost to businesses located along commercial strips. By the 1920s, motor vehicles were not only more numerous but also faster and larger. Motorists wishing to shop grew impatient with the crowded streets and the lack of parking downtown. Land costs were considerably cheaper along the outlying commercial corridors. Soon banks and department stores opened branch outlets along the taxpayer strips, vying for choice plots or major intersections. As one observer explained it, "the new businesses induced more and more customers and the demand for parking soon overwhelmed available curbside space. Before long enterprising developers started building taxpayer blocks, set back a car length from the sidewalk to provide perpendicular parking in front of the stores."[1]

Taxpayer strips could be found all over the country. They were loosely lined with single-story retail stores and occasional supermarkets, movie houses, and two-story commercial buildings. They combined both car- and pedestrian-oriented functions (drugstores, groceries, small shops). Parts of these strips were eventually widened and extended, and these improvements set the stage for strip commercialization and the complete dominance of the automobile.

Soon commercial corridors became lined with gas stations, hot dog stands, motels, shopping centers, and drive-in theaters. As competition increased, merchants looked for new ways to lure their prospective clients. Each sign and building had to visually shout "slow down, pull in, and buy!" Thus, the architecture of the strip became the direct expression of its commercial function. Rules along the strip were usually less strict than those downtown or in older, denser, commercial zones. Keenly aware that trade would be lost if they could not capture the attention of motorists passing by, merchants tried to blend building and sign, architecture and advertising.

1 Liebs, 1985

CORRIDORS DECAY

Immediately following World War II, the scene began to change—and rapidly. Increased suburbanization contributed to the decay and demise of many inner-city commercial corridors. The automobile opened the way to new, low density suburbs; federal policies blessed the move of the middle class to remote and outlying areas. Housing along and behind the corridors filtered down to low-income families. As the economic crisis of the inner city deepened, demand for commercial space along the corridors fell dramatically. Posh shops, banks, and department stores migrated into suburban malls. Starting in the 1960s many small shops serving the neighborhood were boarded up. Some were replaced by long, warehouse-type buildings with blank, windowless facades. Other shops were simply razed, fenced empty lots appearing in their place. Sidewalk trees disappeared, parking lots multiplied, and corridors became collections of micro-environments, a visual hodgepodge of unrelated and often ugly buildings. Proliferating mini-malls at corner lots during the 1980s did nothing to enhance economic vitality.

In the 1990s many inner-city commercial corridors are but skeletons of their formerly prosperous selves. The overabundance of commercially zoned property in combination with economic recession and disinvestment has contributed to high rates of vacancy. Planning policy has ignored or neglected the corridor environment. Without adequate public funds, the public realm has deteriorated. Our survey of three Los Angeles corridors found them suffering from neglect, lack of upkeep, economic disinvestment. Many corridors now lack basic pedestrian amenities, benches and bus shelters are nonexistent, debris clutters the narrow sidewalks. Residents complain bitterly about their crime and ugliness (Figure 1) and desire a range of improvements (Figure 2).

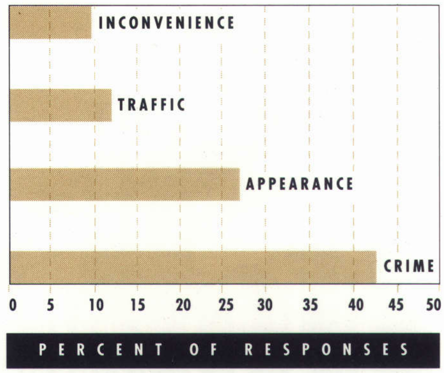
These streets are unfriendly to transit, being devoid of pedestrian life, landscaping, and street furniture. However, they are still the primary transit routes in the city. Hundreds of miles of bus transit are in operation connecting the inner city with outlying employment centers. Hundreds of thousands of people depend every day on a bleak, often hostile corridor environment for transportation services. Up to one-third of our survey respondents do not own a car. In addition to these captive riders, the survey revealed that the majority of car owners say they would use public transit if the bus system were more reliable, clean, and safe and if the public environment (bus stops, sidewalks, streets) were more amiable.

RETHINKING TRANSIT POLICY: TOWARD A CORRIDOR RETROFIT

Transit agencies seek to expand their markets by lowering fares, improving frequency and reliability of service, offering more comfortable and faster buses, relieving overcrowding through proper scheduling, protecting passenger safety when in the bus, and supplying better information on schedules and routes. These are all rational measures, but they ignore an important factor. Unlike travel by private automobile that does not require one to set foot on public grounds, transit travel involves considerable exposure to the public realm. The environment's condition and a person's perception of it—the quality of the street, the sidewalk, and the bus stop—become as important as the reliability, frequency, and affordability of the transit service. People with the option to choose will not be lured by a transit system that exposes them to unacceptable levels of discomfort and risk. Yet, waiting at the bus stop is uncomfortable and often unsafe. The public environment is hostile to pedestrians . Many people avoid the bus, if they can. ➢

FIGURE 1

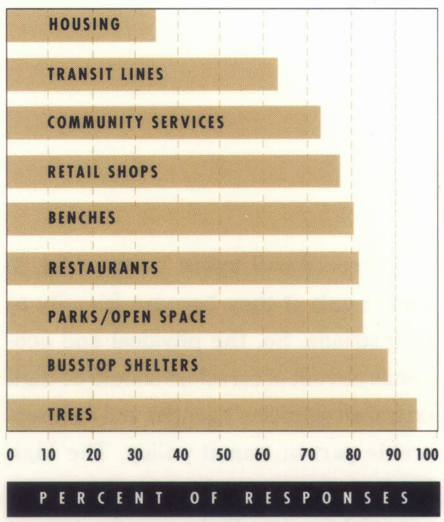
Corridors' Biggest Problems



Based on a study of Los Angeles residents.
Source: Loukaitou-Sideris, 1993.

FIGURE 2

Residents' Desires Regarding Corridor Improvements



Based on a study of Los Angeles residents.
Source: Loukaitou-Sideris, 1993.

A transit corridor in Oakland, CA, 1890s.

Streets will again be friendly to transit only if they become friendly to pedestrians. So, the physical and economic retrofit of corridors should be high on transit agencies' agendas and an inseparable part of transit policy. The high level of transit use along corridors, the potential for even higher use because of the corridors' strategic locations in between employment centers, and the corridors' current underdevelopment that allows for infill and densification, all provide good reasons for promoting pedestrian-oriented improvements and economic rejuvenation.

Reconverting urban arterial corridors to pedestrian use poses quite a challenge. The corridors' basic structure is long and linear, while pedestrians want concentrated and concentrically patterned activities that expand the frequency of shopping opportunities per walking distance. Sidewalks are now interrupted by numerous driveways and parking lots; buildings are often set back from the streets; many building facades are blank; automobile-oriented activities predominate. Still, physical improvements are easier to tackle than economic ones. A rich literature on pedestrian behavior finds that the presence or absence of certain physical/environmental factors can support or inhibit pedestrian activity and, hence, transit use. Variables that encourage or deter pedestrian activity include: density, type and mix of land uses, pedestrian/automobile interaction, configuration and condition of the streetscape, convenience, comfort, and security.

Economic strategies are more evasive but crucial to recapturing the vitality that once characterized corridors. It is quite clear that unless development recurs and businesses, housing, and services return to fill the holes in the corridors, the environment will continue to deteriorate. Inner-city revitalization has been a goal of federal and local governments for decades, but the results of urban renewal did not leave room for hope. Subsequent antipoverty programs did not bring tangible benefits for inner-city residents. So is there any hope now for these streets that form the backbone of the American inner city and its public transit service? Who can plant the seeds for their revival?

For one the federal government has again decided to invest money in the inner cities. It has passed legislation to establish nine federal "empowerment zones" and ninety-five "enterprise communities" in depressed urban and rural areas of the country. Critics are skeptical about the outcomes of this policy, mainly because past efforts with enterprise zones at the state level have not produced major benefits. However, the existence and proliferation of community development corporations (CDSs) in many inner-city neighborhoods raise signs of hope. These are nonprofit, community-based groups consisting of neighborhood residents and local business owners who are dedicated to revitalizing their neighborhoods. They want to enter into partnerships with the federal government and philanthropic foundations to achieve neighborhood-based physical and economic improvement. But even though self-help and community initiative are essential elements of community development, redevelopment is unlikely to occur without serious support from local government and concerted efforts by local agencies—including transit agencies.

In the early days of the streetcar, transit entrepreneurs were among the most powerful urban developers. They built large suburban projects with integral transit lines that made their new houses accessible to downtown and hence salable. These developers understood that environmental quality and volume of transit patronage go together, that each determines and depends upon the other. Today, when most transit systems are owned by governments, they've been turned into specialized agencies, concerned exclusively with running their buses or trains. But our current experience with ever-declining transit patronage suggests that's no longer enough.

Transit agencies now need to play a larger role, a role reminiscent of that played by the transit barons of yesteryear. Because their hundreds of bus lines along these deteriorated corridors are typically running in the red, their self-interest calls for them to rejuvenate their own business by helping to rejuvenate the corridors. I suggest that transit agencies should again go into the land-development business. Bus operators should pursue joint-venture development projects next to transit stops, just as some rapid-transit agencies are now promoting commercial and residential development around subway stations. Bus operators should provide street furniture—benches, kiosks, bus shelters. They should cooperate with municipal and other agencies in beautifying transit streets—replacing lost trees, repaving sidewalks, and encouraging new pedestrian-oriented businesses and related civic activities. ➢

Streets can again be friendly to transit...

...only if they become friendly to pedestrians.

Consider the prospect for "transit enterprise corridors." With the blessing of city council, selected derelict locations might be turned into active development sites, triggered by development incentives to private entrepreneurs and modern transit entrepreneurs—tax breaks for investors, access to credit on favorable terms, judicious use of eminent domain, rezoning to permit mixed land use with fewer restrictions, reduced parking requirements, inducements to nonprofits and CDCs to build affordable housing along transit corridors. Consider what might happen if transit agencies were again to become development agencies. If currently bleak transit corridors were reconverted into attractive places to live, walk, and shop, perhaps many more people would then patronize the transit lines. After all, it was transit that initially defined these corridors, then made them into prosperous business districts where civic activities were once dynamic and rich.

If transit's declining patronage does in part reflect the decline of the corridors, then one way to attract more riders is to make those corridors attractive again. Transit agencies should look back to their predecessors and once again become urban developers, using public transit and corridor revival as mutually reinforcing instruments. ◆

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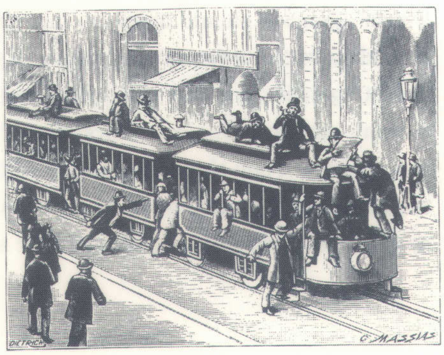

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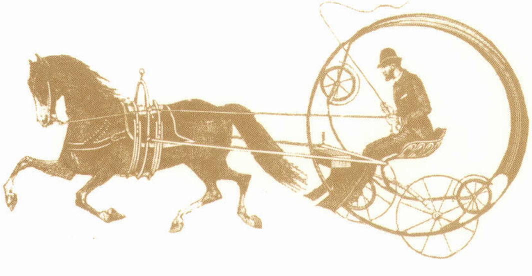

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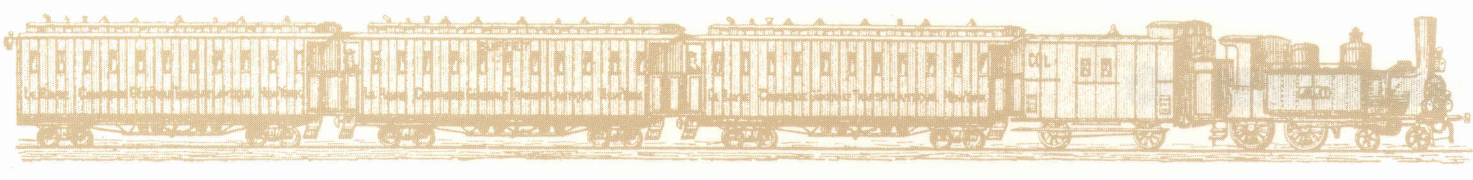

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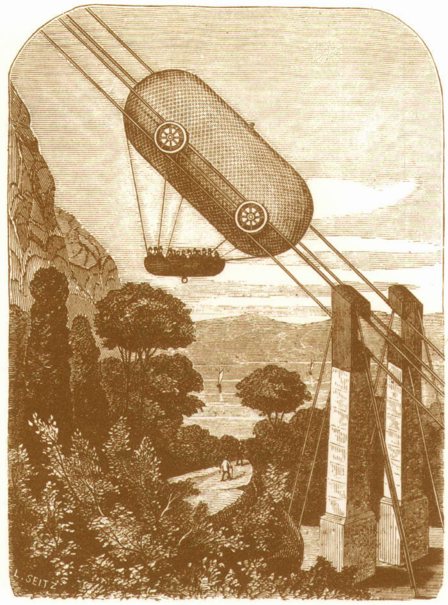

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The Access Almanac:

Love, Lies, and Transportation in L.A.

In the past six months Angelenos have been shaken by earthquakes and scorched by brush fires. Sort of like lumps of tofu in a stir-fry wok. But, what the hell, we're tough out here. We can take it.

What does scare us, though, is suffocation. We're about to go down for the third time in the sea of media cliches that followed the quake. One more mention of "California's love affair with the car" and we're goners. That's not us. If we wanted to fondle cars, we'd be somewhere in Alabama.

But aren't Californians slaves to their cars? Compared to whom? Thirty-six states have more vehicles per capita than California.

But don't we drive a lot? Well, the folks in 36 states drive more miles per capita than we do. But don't Californians get a driver's license at birth? Not exactly, 37 states have more drivers per capita than we do. And for those of you with Greenish inclinations, 42 states use more gasoline and diesel per capita than we do. Ah, but what about public transit? Yes, we have it and we use it. Forty-two states use transit less than we do. The numbers are all right there in Highway Statistics and the Statistical Abstract published by the Feds. That's primary data, not secondary hearsay from newspaper clippings.

So how did this love-affair stuff get started? I have the inside story from a highly placed source. Once upon a time, a New York reporter came out here to learn about the horrors of auto-eroticism. Seek and ye shall find. Especially if you start with the conclusion and then search until you find a fact that supports it. Ignoring the ordinary, this guy finally found someone with a 90-minute commute. He could now go home and write his story: People in Los Angeles travel 90 minutes to get to work.

Not exactly a scientific sample. Suppose I were to visit New York, searched for a long time and found a smiling New Yorker. Would it be fair if I wrote a story accusing New Yorkers of being happy?

But seriously, the pesky government statistics even have something to say about that 90-minute commuter fish-story. Turns out the average commute in L.A. is 26 minutes and the average commute in New York is 5 minutes longer, 31 minutes. That's 10 minutes a day we save on a round trip—extra time to fight brush fires, clear quake rubble, or hum a mantra.

So much for our fabled auto dependence. What phrase might take its place to fill the cliche gap? Well, we do have a lot of hot tubs. Why not write about California's love affair with hot water?

— Charles Lave

MEASURING CALIFORNIA'S "AUTO DEPENDENCE"

	MOTOR FUEL PER VEHICLE	MOTOR FUEL PER PERSON	LICENSED DRIVERS PER 1,000 PERSONS	VMT PER PERSON	VMT PER DRIVER	VEHICLES PER 1,000 PEOPLE	% OF WORKERS TAKING TRANSIT TO WORK	
ALABAMA	722	653	719	10,497	14,610	905	0.8%	ALABAMA
ALASKA	602	497	558	7,054	12,645	826	2.6%	ALASKA
ARIZONA	716	544	640	9,314	14,554	760	2.1%	ARIZONA
ARKANSAS	1,101	687	725	9,247	12,750	624	0.5%	ARKANSAS
CALIFORNIA	655	480	656	8,492	12,944	732	5.1%	CALIFORNIA
COLORADO	570	514	617	8,216	13,314	902	3.0%	COLORADO
CONNECTICUT	592	466	672	8,091	12,034	787	4.0%	CONNECTICUT
DELAWARE	723	568	728	9,884	13,570	785	2.5%	DELAWARE
FLORIDA	688	517	730	8,547	11,708	752	2.1%	FLORIDA
GEORGIA	777	670	696	11,023	15,835	863	2.9%	GEORGIA
HAWAII	534	370	616	7,174	11,638	692	7.6%	HAWAII
IDAHO	590	599	685	9,931	14,498	1,016	2.0%	IDAHO
ILLINOIS	652	463	638	7,401	11,608	710	10.3%	ILLINOIS
INDIANA	775	610	616	9,673	15,715	787	2.6%	INDIANA
IOWA	642	612	664	8,236	12,399	955	1.3%	IOWA
KANSAS	788	593	714	9,293	13,022	753	0.7%	KANSAS
KENTUCKY	772	616	650	9,484	14,589	798	1.7%	KENTUCKY
LOUISIANA	725	519	610	8,163	13,377	716	3.1%	LOUISIANA
MAINE	726	576	720	9,594	13,329	793	0.9%	MAINE
MARYLAND	661	494	661	8,508	12,866	747	8.4%	MARYLAND
MASSACHUSETTS	702	429	701	7,761	11,065	611	8.5%	MASSACHUSETTS
MICHIGAN	672	520	687	8,746	12,735	773	1.7%	MICHIGAN
MINNESOTA	756	558	574	8,857	15,418	739	3.8%	MINNESOTA
MISSISSIPPI	852	621	743	9,605	12,936	728	0.8%	MISSISSIPPI
MISSOURI	841	644	724	9,884	13,660	766	2.1%	MISSOURI
MONTANA	734	696	718	10,290	14,327	948	0.6%	MONTANA
NEBRASKA	702	619	671	8,848	13,189	882	1.2%	NEBRASKA
NEVADA	909	624	708	8,185	11,566	686	2.7%	NEVADA
NEW HAMPSHIRE	626	514	767	8,991	11,722	820	0.7%	NEW HAMPSHIRE
NEW JERSEY	687	489	729	7,640	10,475	711	9.0%	NEW JERSEY
NEW MEXICO	789	673	699	10,835	15,510	853	1.0%	NEW MEXICO
NEW YORK	665	360	569	5,962	10,486	541	25.5%	NEW YORK
NORTH CAROLINA	747	579	675	9,631	14,268	774	1.0%	NORTH CAROLINA
NORTH DAKOTA	716	709	671	9,372	13,972	990	0.6%	NORTH DAKOTA
OHIO	644	511	683	8,502	12,449	794	2.6%	OHIO
OKLAHOMA	756	635	719	10,784	14,997	841	0.6%	OKLAHOMA
OREGON	683	586	812	8,817	10,853	858	3.5%	OREGON
PENNSYLVANIA	686	461	665	7,297	10,978	672	6.6%	PENNSYLVANIA
RHODE ISLAND	651	408	674	7,124	10,576	626	2.6%	RHODE ISLAND
SOUTH CAROLINA	880	611	675	9,679	14,347	694	1.1%	SOUTH CAROLINA
SOUTH DAKOTA	703	702	712	9,546	13,407	999	0.3%	SOUTH DAKOTA
TENNESSEE	656	601	685	9,543	13,930	917	1.4%	TENNESSEE
TEXAS	794	581	651	9,151	14,058	732	2.3%	TEXAS
UTAH	740	514	603	8,695	14,424	695	2.4%	UTAH
VERMONT	755	595	727	10,353	14,235	788	0.8%	VERMONT
VIRGINIA	710	567	740	9,720	13,137	799	4.1%	VIRGINIA
WASHINGTON	610	535	696	9,256	13,307	878	4.7%	WASHINGTON
WEST VIRGINIA	787	557	714	8,898	12,466	707	1.1%	WEST VIRGINIA
WISCONSIN	702	522	685	9,174	13,392	744	2.6%	WISCONSIN
WYOMING	997	1,016	741	13,039	17,588	1,019	1.5%	WYOMING
AVERAGE STATE	723	570	683	9,040	13,250	790	3.2%	AVERAGE STATE
CALIFORNIA	655	480	656	8,492	12,944	732	5.1%	CALIFORNIA
AVG./ CALIF.	1.10	1.19	1.04	1.06	1.02	1.08	0.63	AVG./CALIF.

HIGHS AND LOWS

Source Notes:
Transit mode share data come from *Statistical Abstract, 1993,* Table 1017.
All other data come from *Highway Statistics, 1991,* published by FHWA, U.S. DOT, Tables MF-21, MF-21A, MV-1, DL-1B, VM-2.

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