CONGESTION PRICING IN THE SAN FRANCISCO BAY AREA: SHOULD IT BE DONE?

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Most commuters would surely agree that the snail's pace of traffic along Interstate 880 and US 101 in the Bay Area during peak hours is a disaster. In two studies of urban mobility survey published in 1994 and 2000, which compared traffic and road conditions for an entire region and calculated a regional travel time index, the Texas Transportation Institute (TTI) reported that San Francisco-Oakland, CA, ranked second place, behind Los Angeles, CA, for the most congested regions in both years.[1] Congestion is not a new phenomenon to the Bay Area, and over the past few decades, billion of dollars have been spent on developing numerous innovative solutions in an effort to control or accommodate it, such as constructions of more highways, adoption of HOV lanes, and the recent implementation of "smart growth", "smart parking" and "carsharing", etc. However, economists have long argued that the only way to completely defeat congestion is through congestion pricing. The practice, which has yet seen its implementation in the Bay Area due to controversial concerns, calls for charging motorists more than usual in order to use a roadway, bridge, tunnel or parking spot during peak periods. This paper begins by examining the major remedies, other than congestion pricing, that are often proposed. Critical discussions of whether the notion of congestion pricing should work in the Bay Area is then presented, and the paper concludes by setting out strategies that policy makers, urban planners, and citizens should use to design the most feasible congestion pricing projects possible.

There are situations when widening and building new roads are physically, financially, and politically infeasible. Congestion pricing is one of the many remedies with the potential to improve congestion and manage traffic conditions. Its main idea involves charging motorists a toll for using a particular stretch of highway or bridge or for entering a particular area. It is a market mechanism designed to encourage a shift of peak period trips to off-peak periods, to

alternative routes, and to alternative modes. Other potential remedies of congestion include building tolled roads, using intelligent transportation devices, and adopting parking management programs, etc.

Technologies such as electronic coordination of signal lights, dynamic signs about traffic conditions, global positional systems, and ramp metering can also be effective tools of increasing flows and reducing travel delays. Yet they will not reduce congestion in the long term due to induced demand. A huge drawback of implementing congestion-priced highways in the past was the technical obstacle to collect tolls. Recent advances of IT have made congestion pricing much more technically feasible. Electronic toll collection, such as "FasTrak", has made it possible to collect congestion charges without worsening the problem by creating congestion at tollbooths. In case of dynamic pricing, advances of IT have also provided "real time" adjustments to toll prices. If a highway has become too congested, run-time signals will be sent to an electronic message board half a mile or so before the entrance, informing solo-drivers of the updated usage price.

Parking management is one of the major remedies that are often implemented in the Bay Area. Whether or not its programs receive public support depends very much on the types of strategies used, and how revenues are used. California Partners for Advanced Transit and Highways (PATH) recently launched a field operational test of a smart parking system at the Rockridge BART station in the East Bay in December 2004[2], in an effort of expanding effective parking capacity, transit ridership, and revenues. Parking pricing and special Early Bird programs have also been implemented to reduce the number of solo drivers. Furthermore, studies have shown that if firms provide employees a stipend, or subsidies, for shifting to alternative modes, the number of vehicles on the highways will be reduced.[3] Such Cash-Out programs are

being proposed in Washington State, and are viewed as fair to politicians since they will benefit low-income people as well.

No matter how hard urban planners try to induce traffic to alternative modes, they tend to neglect the fact that automobiles will remain central to urban life due to the American addiction to automobiles. When toll roads, parking pricing, and better transit systems reduce vehicle usage and thus increase highway capacity during peak time, delay due to congestion may be reduced as an immediate effect. However, as the increased travel speed makes the travel attractive, drivers who had formerly changed their modes, chosen alternative routes, or shifted their travel time towards shoulders of peak periods would shift onto this less congested route. In the long term, the facility will be back to congestion. Limited transit usage often leads to urban transit crisis, when transit companies could not raise fares to the level necessary to earn profits high enough to attract investments and cover operational costs. That's why congestion on the San Francisco-Oakland Bay Bridge improved only temporarily when BART opened in the 1970s.

There are several congestion pricing measures which may be implemented in the Bay Area, such as variable tolls, area tolling, high occupancy toll (HOT) lanes, and fast and intertwined regular (FAIR) lanes, etc. Tolls serve as charging motorists of a specific section of the road network for its use and raising money to pay back the construction of the road or to build new facilities. This tactic is fairer than other funding options because non-users do not have to pay for the facilities they do not use. In principle, the toll can be raised to a level high enough to eliminate traffic congestion. It is therefore economically infeasible to impose a constant toll throughout all periods of time, because the congestion level on a road varies over time. Despite implementation of congestion pricing has been a success in Singapore and European countries[4], there are merely a dozen congestion-priced projects being adopted in the United States. In

California, private investors built the 91 Express Lanes along the already-congested State Route 91, giving motorists a choice between toll-free traffic on previously existing roads or paying to use the new, free-flowing lanes[5]. Tolls can vary based on a fixed schedule, as in the State Route 91 Express lanes, or they can be run-time, as in the Interstate 15 HOT lanes in San Diego, meaning that the price changes on the basis of the level of congestion at a particular time. [6] In a HOT lane, carpoolers may drive for free while drivers of single occupant vehicles pay a toll to use the lane.

Area tolls are fees paid by motorists to drive in a particular region, usually a central business district. Most area tolls usually apply during peak periods. Vehicles entering the charging zone are charged based on time of day, with fares the highest during peak hours, or they are required to display a pass pre-purchased with fixed price. These area tolling strategies are practiced in the city of London. The system runs not with tollbooths, but with high-tech cameras that capture images of license plates. Drivers are able to pay the fee via phone, the Internet, mail, or in person. Vehicle traffic speeds in London highways have increased, and bus transit service has improved, while accidents and air pollution have declined in the city center. Public acceptance has grown and there is now support to extend the strategies to other parts of London[4]. There is every reason that New York, a city similar to London in terms of high population density and complicated transit network, can opt for area tolling as a way to reduce congestion. Area tolling in Bay Area, however, should be problematic, largely due to the low-density dispersion of urban cities. City governments fear that congestion will drive investments and business transactions elsewhere, but refuse to implement area tolls since doing so will redirect growth to other cities. Moreover, the percentage of peak hour trips made by automobiles is much less in London than in the Bay Area, which has been "sprawling" over the past decade, making it

difficult for its transit and bus systems to operate over a network of diverse origin-destination pairs.

Controversial opinion of the Express and HOT lanes has surfaced for years. Politicians generally object the idea of congestion-priced roads because they seem to be used only by people with high income. It may be unfair to low-income users who are less able to afford tolls than higher-income users. There may also be equity concerns associated with travel modes, since HOT lanes may induce traffic from alternative modes. Moreover, motorists, regardless of their income, tend to resist HOT lanes unless they receive some tangible benefit for not using the HOT lanes. The problem of "fairness" has given rise to the innovative concept of the Fast and Intertwined Regular (FAIR) lanes, which proposes that low-income users are provided a "credit" each time they use the toll-free lanes during peak time. This credit can be redeemable toward paying their toll on the HOT lane or other transportation services. Carpoolers would be able to use the HOT lanes without paying a toll under all circumstances. This tactic does not solve all equity concerns though, as it seems to be inequitable to the middle class who is barely eligible for credits.

The equity problems as viewed by politicians are not really parallel to how the public thinks about the program. In a recent focus group conducted with frequent Interstate 580 and Interstate 680 users, the Alameda County Congestion Management Agency reported that concerns about income equity "are not a major determinative factor in public acceptance of HOT lanes"[7]. In fact, revenues generated from tolled roads will fund highway projects and mass transit system improvements, so at the end of the day, people of all income profile would be benefited. Thus, HOT lanes have now become widely accepted in the industry. Now the question is, should HOT and Express Lanes be implemented in the Bay Area?

Let's consider a case study of a privately owned 91 Express Lanes in the Orange county of California. There was a clause between Caltrans and the owners of 91 Express Lanes before construction; it gave the owners of the Express Lanes power (the non-compete clause) to block major improvements on public highways that they believe might dissuade traffic from the Express Lanes and reduce revenues yielded. The Orange County Transportation Authority has recently bought back the toll road, so that hundreds of millions of dollars planned to fund the Riverside Freeway improvements won't be halted due to the non-compete clause[8]. With the passage of the Intermodal Surface Transportation Efficiency Act of 1991[9], funding was provided by Congress to support pilot tests and feasibility studies of road pricing by State, local governments and public authorities. Current Bay Area projects under development include HOT Lanes on Interstate 880 in Alameda County and FAIR Lanes on Interstate 580 and Interstate 680 in Alameda County, California[7]. These public lanes would by no means interfere with other contemporary public highway improvements. There is little doubt of why HOT and Express Lanes cannot be implemented in the Bay Area.

One should not diminish the fact that while there exists political concerns, variable pricing should definitely work in principle. When a road is charged less than what users are willing to pay for using it, motorists tend to demand more of it. Thus, congestion is considered to arise from the mislabeled price of highway capacity. On the other hand, there are two measures of congestion: the physical congestion of a road and the perceived congestion by motorists before they decide whether or not to get on the road. Let's take human behavior into consideration. Motorists will use the road if the virtual congestion cost associated with their perceived traffic condition is less than their benefit gained from using the road. However, all they care is merely the traffic in front of them; they won't even consider the following

congestion condition their business at all. Congestion pricing should therefore work, since users are charged the costs their usage would impose on the actual congestion and other motorists.

Highway construction has become the biggest piece of Governor Arnold Schwarzenegger's 10-year infrastructure plan declared in his recent State of the State speech[10]. Yet, the vast majority of the costs of building, repairing, and operating highways have been paid through a system of tolls and fuel taxes. In America, one-third of the cost of gasoline at the pump is charged to cover highway and transit construction and operational costs. The Bureau of Labor Statistics reported that, during the past 12 months, gasoline prices in the Bay Area jumped almost 22%, but the inflation rate rose only 2.9%[11]. These numbers seem to implicate that with the continuous rise of gas prices, the government should have generated huge revenues for highway projects; collecting congestion fees from users who would then doubly pay might not be necessary and acceptable.

However, existing road user charges in North America are insufficient to cover total roadway costs, according to FHWA. Gasoline companies tend to increase gas prices due to the increasing demand. With the government's reluctance to raise the gas price, fiscal productivity of these revenues will become volatile. Moreover, revenues generated from fuel taxes do not levy charges at the time of travel – it is not fair for motorists traveling during non-peak hours to pay as much fee, through gasoline taxes, as those traveling during peak hours. On the other hand, a 2004 state law (AB 2628)[12] enables low-emission hybrids to travel on HOV lanes on California freeways regardless of how many passengers they carry. Over time, hybrids and electric vehicles will gradually replace gasoline-fueled vehicles, limiting a major source of funds on financing highways and transit systems. Variable lane tolling will generate significant revenues for the benefit of the people themselves.

Current congestion pricing projects in the Bay Area would be an important test of the political feasibility of congestion pricing in other major democratic cities. This paper has shown that congestion pricing is technically feasible and effective, and that it is possible to overcome the political and institutional resistance to such pricing. Nevertheless, implementation is not easy. It requires a suitable combination of road pricing and improvements of other modes, including widely distributed benefits and the ability to overcome public skepticism, which is challenging since the Bay Area has a particularly large portion of automobile commuters. While the application of new technologies and adroit capacity expansions may present the best opportunities for managing congestion in the short run, congestion pricing is probably an inevitable solution that offers the best opportunities for slowing the growth of congestion.

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