

Appendix E

Transportation Pricing Strategies Analysis

Analysis: Opportunities to Reduce Greenhouse Gas Emissions through Transportation Pricing Strategies

SECTION I

Transportation Pricing Explained

The phrase “transportation pricing” encompasses a variety of different programs that attempt to offset the hidden costs of transportation. These programs generally have two overarching goals: create revenue for transportation efforts and encourage more residents to take advantage of public transportation. At first glance transportation pricing may seem to be an indirect form of transportation taxation; however, these programs can be justified as not just another way to increase government funds, but rather to reduce driving subsidies and shift the costs to those who are responsible for them. Driving imposes many costs on society as a whole, including air pollution, increased greenhouse gases, and congestion. Local agencies are required to mitigate impacts from transportation sources. Pricing policies can be used to shift the mitigation costs to single-occupancy drivers while rewarding those who take advantage of available public transportation or carpooling/vanpooling.

Transportation pricing measures can also act to educate drivers about their true transportation costs as compared with costs for alternative choices of travel. Consumers can make more informed decisions about how much they are willing to pay and how and when they want to travel under a pricing system based on true costs. Transportation pricing measures can potentially be effective in not only accurately shifting transportation costs, but also in reducing traffic congestion, air pollution, as well as greenhouse gas emissions. These measures have the potential to affect environmental change much faster than building facilities or changing vehicle standards. However, the associated personal behavioral changes that are necessary to increase public transit use have proven difficult to achieve.

This technical report does not represent any decisions or policies of the Council of Fresno County Governments. This document is intended to provide interested parties with background information on transportation pricing programs. The document will provide a discussion on transportation pricing, the variety of pricing options that are available for consideration, and which programs are most effective. The main goal is to spark conversation about transportation pricing measures and provide yet another tool for transportation planners. It is among many planning tools that Fresno COG has investigated with the associated goal of reducing greenhouse gas emissions from mobile sources.

SECTION II

Transportation Pricing Addresses Various Transportation Costs

Environmental Costs of Transportation

One objective of transportation pricing programs is to increase public transportation usage, and consequently decrease the number of vehicles on the road. The second goal is to allocate costs to people who drive most frequently, which could reduce the public’s vehicle miles traveled (VMT) as people decrease their car usage in order to save money. Even though advanced technology is manufacturing much cleaner cars, the sharp increase in VMT has not only outpaced population growth trends, but has outpaced the emission reductions achieved through technological improvements. By decreasing vehicle usage and VMT, transportation pricing policies have the ability to significantly reduce mobile sources of

air pollution including greenhouse gases. While the public currently hears a lot of news coverage regarding the emission of carbon dioxide (CO₂-a greenhouse gas) from cars, the range of air pollutants does not stop there. Pollutants from transportation/mobile sources also include:

- Particulate matter
- Volatile organic compounds (VOC's)
- Nitrous Oxide (NO_x)
- Carbon monoxide

In addition to the reduction of VMT, transportation pricing measures can also reduce air pollutants through innovative use of the funds generated. Funds received from transportation pricing measures can fund improvements such as traffic synchronization. Since carbon dioxide emissions tend to increase at lower speeds and particularly with stop-start driving, traffic signal synchronization can act to reduce carbon dioxide emissions. The Fuel Efficient Traffic Signal Management Program in California estimated that traffic signal revisions at 3,172 locations resulted in 8.6% savings in fuel consumption, which translates to a significant decrease in emissions. (The Benefits of Retiming Traffic Signals; ITE JOURNAL / APRIL 2004)

Societal Costs of Transportation

The societal costs of transportation may not be widely discussed, however their effects are undeniable. One of the first issues is that more vehicles on the road lead to greater traffic congestion and travel times. This not only presents an inconvenience to the everyday lives of the public, but it is also extremely costly. A 1991 study of the 50 largest U.S. cities found that traffic congestion and delays resulted in estimated total economic losses of over \$45 billion. (Deakin, Elizabeth; Greig, Harvey; Transportation Pricing Strategies for California: An Assessment of Congestion, Emission, Energy and Equity Impacts. Technical Report prepared for the California Air Resources Board. June, 1995.) The incorporation of transportation pricing measures could benefit the general public through reduction in travel times, traffic congestion and the resultant translation to more money in the pockets of the public as economic losses decrease.

An important secondary consideration is that increasing VMT and congestion require additional funding for the construction, maintenance, and monitoring of the transportation system. The implementation of transportation pricing measures could decrease the funding required for the preservation and maintenance of the transportation system, as wear and tear is lessened. Traffic congestion also exacerbates accident rates, contributing to the increased burden on public services, lost work-days, medical and disability costs. Transportation pricing strategies can play an important roll in increasing public safety and preserving public funds.

Lastly, the most detrimental societal effect of air pollution from transportation sources is the associated health effects. A study by researchers at CSU Fullerton concluded that health effects of air pollution on the San Joaquin Valley translate into 460 premature deaths, 325 new cases of chronic bronchitis, 3,230 cases of acute bronchitis in children, 260 hospital admissions, and 23,300 asthma attacks. (Hall, Jane, Ph.D ; Brajer, Victor, Ph.D.; The Health and Related Economic Benefits of Attaining Healthful Air in the San Joaquin Valley, March 2006). The 2008 update of this study found that the health effects translate into a cost of \$6 billion dollars per year in the San Joaquin Valley. This translates into over \$1,600 per person in costs associated with respiratory illness, lost school-days, lost work-days, medical care, even premature deaths. (Hall, Jane, Ph.D ; Brajer, Victor, Ph.D.; The Benefits of Meeting Federal Clean Air Standards in the South Coast and San Joaquin Valley Air Basins, November 2008) This study quantified the costs associated with "criteria air pollutants", from all sources, not just transportation. At this point in time greenhouse gases are not designated as "criteria air pollutants". However, the U.S. Environmental Protection Agency has made a finding (12/15/2009) that greenhouse gases endanger public health, which could lead the way to a formal designation. It is important to recognize that reducing criteria pollutants from mobile sources will have the co-pollutant benefit of associated reductions in greenhouse gases. The health costs can be reduced by approaches to reduce total mobile source emissions.

Hidden Costs of Transportation

The overall costs of driving are often overlooked. The true costs are underestimated because many of the costs are hidden, not incurred at the time of travel, or not paid based on how and when people drive. Only a small fraction of the total costs are paid directly by drivers in existing fuel taxes and tolls. Drivers may consider the cost of the gasoline or the wear and tear on their car when they are deciding whether or not to drive. However, other costs such as air pollution; potential effects of greenhouse gases; water pollution; traffic congestion; the risk of an accident; or the costs of planning, building and maintenance of roads are usually not factored into their decision to drive. Transportation pricing programs seek to remedy that disconnect. The following programs are designed to incorporate the cost of driving into consumer decisions. These programs have the capability to be targeted towards specific pollutants, problems, and goals.

SECTION III **Transportation Pricing Programs**

Reduced Transit Fares

The purpose of reducing transit fares is to both increase public usage and to recruit new users of the transit system. The reduction of transit fares does not imply a permanent reduction in fares, but rather as a limited time incentive to increase overall public transit usage. This transportation pricing measure has previously been used by the Fresno Area Express Bus System (FAX). Transportation officials noted that the reduction of transit fares became very popular among regular users of transit. The increase was felt to be an increase in number of trips each rider was taking during the reduced fee day. In general, the increase in ridership appeared to be a measure of success, yet it did not translate into an increase in new ridership overall. In some of the larger cities in California with higher densities, such as Los Angeles and San Francisco, this pricing policy has proven to be more successful.

Transit Fare-Free Zones

Fare-free zones are free one-way routes to a chosen destination. These destinations are usually major landmarks which include malls, arenas, or local recreation centers. Fresno employed fare-free zones during periods of excessive heat in the summertime to provide free transit to cooling centers including Fashion Fair Mall, Manchester Mall, and Edwards Cinema. This service turned out to be quite popular among Fresno residents, as the number of FAX travelers increased considerably during this period of time. Due to the success of this pricing measure, further consideration to employ a pilot program of fare-free transit to other popular destinations could be explored to see if it might successfully encourage new ridership throughout the year. Offering fare-free zones periodically throughout the year could create a continual growth in FAX usage. If successful, other cities in Fresno County could expect similar success by implementing fare-free zones to popular city destinations. By increasing public transit and decreasing VMT, the Fresno County region could make progress in decreasing mobile sources of air pollutants, including greenhouse gases.

Transit Vouchers

Some California cities have a program of distributing transit vouchers, at random, for public usage. The goal of this program is to encourage non-transit users to try out public transportation using the free voucher and hopefully experience the convenience of public transit. However, transportation officials noted that the majority of people that took advantage of the vouchers were regular transit riders already. The short term spike in new riders did not translate into increased regular users of transit. In Fresno, FAX currently offers free transit –the “FAX Senior 7” program to senior residents (65 years of age and over). Free service is offered any day, any time, for any trip purpose. Seniors do take advantage

of the free transit; however, many are typical riders already especially those that have lost their ability to drive. Transportation officials report that the FAX Senior 7 is hugely successful, showing great increases in ridership numbers. However, it is felt that much of the increase reflects many more trips being taken by each rider than perhaps more overall riders. FAX is unsure, consequently, if free passes for senior citizens really had the effect of attracting new riders.

FAX officials have discussed selling fare transit vouchers, in which the pass would be good for transit during a set amount of time (2 hours for example.) A pilot program offering free vouchers or at a reduced price might provide valuable information of the efficacy of this approach. This program would be an attempt to persuade people to take advantage of the FAX system when running errands, (trip linking) such as going to the grocery store, the mall, or movies. The key to success in a program such as this would be making sure that bus routes are conveniently spaced and relatively frequent.

Free Transit Days

There are two general goals behind the strategy of offering days in which transit is free: to attract new public transit users and to limit car travel on poor air quality days. The City of San Francisco has offered days in which all public transit was free. City officials anticipated increased ridership. Perhaps not anticipated was the criticism the program evoked. The overall costs associated with emission reductions were prohibitively expensive, in the area of \$100,000 per ton of NOx and hydrocarbons, and \$10 million dollars per ton for particulate matter. (For reference: Fresno COG uses a threshold of \$60,000 per ton as cost-effective for emission reductions). In addition the free fares were also linked to an increase in burglaries/robberies and calls to transit police spiked. Regular users of the ferries complained of overcrowding and felt that recreational riders took the place of commuters. A proposed approach is to limit the "free" rides to morning commutes only.

Fresno has explored this strategy. The San Joaquin Valley Unified Air Pollution Control District held discussions with FAX to explore the feasibility of funding free bus transit on poor air quality days. Barriers to implementation included the difficulty of forecasting future bad air quality days in enough time to publicize the availability of the free transit, as well as difficulties in determining the reimbursement due to FAX for the "Spare the Air" riders versus the regular ridership.

In order to encourage new ridership, FAX has used "fare free days". Transportation officials noted that free transit fares became very popular among regular users of transit, and they saw many more trips on the free days. The overall increase was felt to be an increase in number of trips each rider was taking during the "free" day rather than an increase in new riders. In general, the increase in ridership on the free days did not translate into an increase in new long term ridership.

In general, for transit to be an effective transportation pricing strategy the entire transit system need to be convenient and reliable. Local funding (Measure "C") can play a part, yet public transit requires full, dependable state and federal funding support to ensure success.

Tolls on Freeways and Highways

While toll roads are arguably one of the most socially unpopular pricing strategies, they prove to be extremely effective for the reduction of single-occupancy vehicle use and for generating funds for road construction and maintenance.

One of the major political concerns with the implementation of a toll road is how the government would be able to fund its construction and maintenance. Some cities have engaged in a Public Private Partnership (PPP) for the integration of road tolls. In a PPP, the private party covers construction and maintenance fees for a toll. It is the assurance of a steady stream of revenue from the toll that attracts private sector

involvement. Some of the major benefits of a PPP as opposed to a strictly publicly financed toll roads are:

- Projects are planned and constructed more quickly
- Efficiencies result from exempting private developers from traditional government rules
- Income is generated for local, state and national governments from property and incomes taxes paid by the private business

Although the private partner would set the toll rates, all revenue would go to the public sector. The public agency would reimburse the private partner with a flat shadow toll paid for each vehicle served at free-flow speeds during peak commutes. This would give the private partner an incentive to prevent traffic congestion and to expedite road service response to accidents. In addition, the private partner could receive a payment for each transit or high occupancy vehicle (HOV) trip served above a base usage level. This would encourage the private partner to promote public transit and carpooling. If for some reason the public partner sees a vast increase in the amount of transit or HOVs then the payment could be adjusted accordingly.

It is important that ability to pay is factored into pricing policies. First of all, most tolls charge at all times to maximize revenue. However with the PPP tolls, users might only have to pay fees during high-traffic hours. In addition, HOV lanes could be exempt from payments, as this would undoubtedly encourage more carpooling. Lastly, discount tolls could be provided to low-income motorists who must travel via car. The incorporation of electronic toll collection and electronic debits of accounts of registered users, which are linked to individual car transmitters, could easily identify carpool/ low income users and make adjustments in the pricing used.

Fuel Taxes

Taxation has the ability to drastically reduce transportation demand. Fuel taxes have been used for quite some time to cover the maintenance costs of the National Highway System and state roads. High fuel taxes can have the effect of making driving prohibitively expensive, reducing and discouraging private vehicle use, leading to decreased vehicle miles traveled and associated vehicle emissions.

Fuel taxation can be effective, but used as a pricing strategy alone is not completely feasible. Most estimates by the EPA suggest that taxes would have to be raised by more than one dollar per gallon to significantly influence driving behavior. As evidenced by the recent wide fluctuations in gas prices, when gas becomes prohibitively expensive public behavior does change. Transit ridership increased, sales of hybrid vehicles and more fuel efficient vehicles rose, fuel purchases dropped leading to significantly decreased funds (from fuel taxes) generated for road repairs.

Fees Based on Vehicle Use

Policies to assess fees based on vehicle use or VMT promote reductions of both congestion and pollution. In contrast to measures such as gasoline taxes, where the costs can be reduced by choosing a more fuel efficient vehicle, the only way to reduce one's costs under this measure is to drive less, thus reducing emissions and traffic. Difficulties encountered with this policy include setting the amount of the fee, the types of vehicles driven, how the program is administered, and creating travel alternatives.

Representative James Oberstar, chairman of the House Transportation and Infrastructure Committee suggested (April 2009) that Congress enact a mileage-based tax on cars and trucks. The system could employ GPS technology to determine VMT, location of those miles traveled and further calculate the amount of tax owed. Oberstar feels that a vehicle miles traveled tax is a logical complement, and perhaps a future replacement, for fuel taxes.

Fees Based on Vehicle Emissions

Emissions fees, or smog fees, propose to internalize the costs of air pollution by charging drivers per pound of emissions they create. These fees could directly affect transportation based sources of air pollution by encouraging a shift to cleaner burning engines and reduced VMT in higher polluting vehicles.

Although emissions tests are required and often associated with registration fees in California, charges based on actual emissions have not been implemented. One approach might be to set fees on the purchase price of an automobile or registration fees, based on the automobile's fuel efficiency, engine type, or vehicle age and weight. Currently residents in the San Joaquin Valley Air Basin pay a set air quality fee (for mitigation of mobile source emissions) each time a vehicle is registered. The fee is assessed per vehicle, not as a variable based on the amount of emissions that specific vehicle produces.

Park and Ride

Park-and-Ride lots provide a place for drivers to park and utilize public transit, carpools, and vanpools for work and other trips. Most sites are near major interchanges and some offer bike lockers. Park-and-Ride programs can help contribute to the successful implementation and operation of freeway high-occupancy vehicle facilities.

Park-and-Ride programs can help to develop a balanced and sustainable transportation system. They improve the coordination of the entire transportation system, reducing congestion, providing transportation choices, and enhancing connectivity. In addition, they contribute to the development of a more eco-friendly transportation system.

Fresno COG granted \$380,294 in 2009 CMAQ funding to a park and ride for the City of Fresno: The Sugar Pine Trail Park and Ride at Shepherd and Willow Ave.

Parking Pricing

In larger metropolitan areas, drivers are often confronted with parking fees once they have reached their destination. In most suburban or rural areas, such as Fresno County, parking fees are rare. Consequently, the fees collected from parking normally do not support public road expenses and the general abundance of free parking can indirectly promote single-occupancy vehicle usage.

The majority of workers do not pay to park at their workplace. If required to pay to park, carpooling or using public transportation for commute trips would be much more attractive-especially if free spots are reserved for carpoolers.

Studies suggest that parking pricing strategies are most effective in areas where public transit is readily available. Financial support for city and rural transit plays a tremendous roll in the reduction of single-occupancy commute trips.

Retail establishments and restaurants view parking fees as detrimental to their customers. Thorough study is required to balance the cost/benefits ratio of the implementation of parking pricing.

SECTION IV

Additional Strategies Employed in Fresno Region

In addition to Fresno COG's participation in the previously mentioned pricing strategies, additional programs have been implemented to further encourage alternatives to single-occupancy vehicle use. The

programs work to both decrease VMT and vehicle emissions, (including greenhouse gases) while providing innovative ideas to effectively serve the transportation needs of Fresno County residents.

Measure “C” Carpool Incentive Program

The Measure “C” funded Valleyrides Carpool Incentive Program provides a monthly cash prize as an incentive to increase carpooling in Fresno County. Each month one participant in the incentive program is rewarded with a \$1,000 cash prize, as well as being entered in an annual grand prize drawing. The incentive has proven to be very successful. This program is definitely an example of a win-win strategy. The incentive encourages residents to experience a different commute style, a few receive an additional monetary prize, and all residents are able to benefit from the emission reductions and improved air quality. The advertising appears on both TV and radio using the tag line: “Save our air, save on gas, win cash!!”

To qualify for the Valleyrides Program, participants must meet the following requirements:

- carpool at least twice a week with at least one person to work or school
- carpool must be to or from Fresno County
- register their carpool online
- fill out a new carpool log on the website each week

In addition, this program is yet another example of the broad based, interagency, cooperative approach that Fresno COG frequently incorporates in our planning processes. The program is a partnership with California State University, Fresno and the San Joaquin Valley Unified Air Pollution Control District.

Measure “C” Senior Taxi Scrip Program

The “Senior Taxi Scrip Program” is also funded by Measure “C”. The program provides subsidized taxi service to seniors (70 years and above). This program provides a reliable and financially feasible alternative means of transportation for the growing population of senior residents in Fresno County. Participants receive a 75% discount on taxi fares by purchasing “taxi scrip.”

Participants submit an eligibility application and, once approved, are eligible to purchase a \$20 value booklet of taxi scrip for only \$5. The scrip is used like cash to pay for taxi cab fares 24 hours a day, seven day a week. The program has proven to be extremely popular.

Commuter Vanpool Program

The 2006 Measure “C” Extension Expenditure Plan includes subsidies and reimbursements for newly forming and existing vanpools, also known as the Commuter Vanpool Program. The program is geared toward improving air quality and providing a cost-effective alternative to single-occupancy vehicle travel to work and school. It was designed to increase the number of vanpools in the Fresno County area, while also offering financial assistance to ensure success. The Commuter Vanpool Program is open to both public and private industry, as well as potential public/private partnerships.

The financial subsidies and reimbursements can cover the following expenses:

- Monthly lease subsidies up to \$350.00 per month, for up to 1 year
- Start-up costs, such as medical exams, up to \$50.00 per driver
- Driver replacement costs up to \$75.00
- Up to \$100.00/participant paid to the primary driver
- Parking Permits up to \$100.00 per month

This financial assistance makes the future of the Commuter Vanpool Program very promising. Those already taking part in vanpools are encouraged to continue and take advantage of the financial incentives. Additionally, the incentives can play a large part in the establishment of new carpools. This program holds the potential of substantial reductions in VMT, congestion and associated emissions (including greenhouse gas reductions).

Farm Worker Vanpool Program

The Farm Worker Vanpool Program is also funded by Measure “C”. This program provides safe transportation to the commuters’ destinations, improves air quality, reduces congestion and provides a cost-effective alternative to single-occupancy vehicle use. The program provides free vouchers to farm workers who ride in designated vanpools. Eligible reimbursements include:

- Start-up costs such as medical exams for up to \$50.00 per driver
- Driver replacement costs (up to \$75.00)
- An emergency ride home program
- Up to \$100.00/participant paid to the primary driver
- Monthly vouchers issued by an eligible operator

Fresno County Rural Transit Agency

The Fresno County Rural Transit Agency (FCRTA) serves elderly, disabled, low income and general public patrons within each of the thirteen rural incorporated cities of Fresno County. Many unincorporated rural communities are also being served. In addition FCRTA also provides service to neighboring counties. Measure “C” provides funding to the FCRTA.

SECTION V

Conclusion: Feasibility Studies

This report has provided only preliminary information regarding transportation pricing measures. In order to adequately evaluate the pricing strategies discussed and to evaluate for their applicability, additional studies would need to be conducted to completely assess each concept’s feasibility for implementation in Fresno County. Fresno COG has made attempts to receive funding for such work, but has been unsuccessful. In 2006, the Fresno County Council of Governments and the California Department of Transportation submitted a grant application for a pre-implementation study through the Federal Highway Administration’s Value Pricing Pilot (VPP) Program. The intent of the study was to identify and evaluate transportation pricing strategies and lay the groundwork for future implementation. Fresno COG’s grant application had three components: 1) to identify and engage a group of stakeholders from the Valley’s leaders, 2) to contract technical consultants to perform a detailed analysis, and 3) provide public education, marketing, and media outreach. However, this proposal was unfortunately denied on the basis that it was not an absolutely pertinent project.

Fresno COG continues to be proactive in efforts to incorporate transportation pricing strategies where feasible, and maintains our established policies of funding such projects. Pricing policies are one of the many tools that Fresno COG continues to employ to meet the transportation needs of the region as well as working to reduce the various impacts of those projects including the resultant effects of greenhouse gases.