

Peak Oil Preparedness Task Force: Transportation Evaluation

Of all sectors vulnerable to the impacts of peak oil, transportation is easily the most directly impacted. The substantial majority of privately operated vehicles rely on gasoline and oil, as do a non-negligible portion of city-owned and public-transit vehicles. Substantial transportation mode shifts may be imposed upon those who live and work in San Francisco, increasing the burden on an already strained public transportation system. In order to avoid the worst impacts of peak oil, the City of San Francisco must make long-term sustainable investments in transportation that can affordably be operated in a low-fuel environment.

San Francisco must also focus on zoning, planning, and development policies that allow and encourage low fossil-fuel consumption: mixed use, walkable, bikeable neighborhoods built around reliable transit lines and hubs.

Fortunately, San Francisco not only has made substantial investments in modes of transportation not dependent on fossil fuels, but has for decades operated on policies that make public transit a critical planning priority. This important emphasis on transit, along with the natural, sprawl-inhibiting boundaries of the city, have helped the city develop a relatively efficient transportation system with a wide service area.

Because each mode of transportation the city currently uses will be affected differently by peak oil conditions, they have been separately analyzed below.

Automobiles

Automobiles are by far the mode of transportation most directly affected by petroleum shortages. While there has been a recent push to move to hybrid and plug-in electric vehicles, there are challenges with implementing both of these options. The most immediate challenge is simply the difficulty of replacing the vehicles on the road today with alternatives that are less petroleum-dependent. The median age of automobiles in America today is nine years; assuming this holds, even if new vehicle sales were to switch tomorrow to being entirely hybrid or electric, half of the autos on the road would still use conventional, non-hybrid, gasoline engines. However, we are very far from reaching such a goal: in 2007, only [%] of autos sold in [US? CA?] were hybrid vehicles, of which [%] were light trucks getting less than [25? 30?] miles per gallon. [] cars – less than one [] of one percent – were plug-in electric or fuel cell vehicles.

Automobiles are the most expensive and least sustainable method of transportation available to San Francisco residents and visitors. However, hybrids reduce but do not eliminate the challenges of peak oil, and citywide networks of electric and fuel-cell cars present a range of their own problems, and

require exorbitantly costly infrastructure investments that have not been successfully implemented at any scale anywhere in the world.

Hybrid automobiles only lessen, but do not eliminate the problem of gasoline dependency. Even those hybrids that manage to get 50-60 miles per gallon will be costly to fuel if the price of gasoline rises to \$8, \$10, or \$15 per gallon (or beyond). And no hybrid vehicle in regular use is efficient enough to make it through a gasoline shortage of any significant period.

Plug-in electric and fuel-cell vehicles, while not dependent on gasoline, face fueling challenges too. Most advocates of such vehicle types believe that, for electric vehicles to feasibly serve as a replacement for conventional-gasoline-engine cars, it would be necessary for San Francisco to undergo extensive, city-wide infrastructure upgrades to install charging stations throughout the city, with an unknown final cost. And San Francisco does not have the significant electrical infrastructure that would be necessary to charge more than a fraction of the vehicles on the road: a recent study estimates that, given current capacity, Western states would be unable to handle a conversion of more than 15% of the current automobile stock to electric vehicles.

There is also the cost of the vehicles to consider, both to their owners and to the City of San Francisco. AAA of California estimates that, at recent fuel prices, it costs an average of \$7,000 per year to own, operate, insure, fuel, and maintain an automobile. If peak oil conditions have serious cooling effects on the U.S. economy, as they are widely expected to, private auto use could become exorbitantly expensive for many San Francisco residents; encouraging a shift away from autos now, before conditions worsen, will help ease the challenges San Francisco residents may face later. The City, too, will have lighter infrastructural burdens if the number of automobiles on the road is decreased.

This is not to say that auto alternatives to the conventional gasoline-powered car should be abandoned. The broader point is that the challenges in bringing alternatives to market will be significant for all potential solutions. Because direct substitution of more efficient autos most closely matches current transportation patterns, it is tempting to assume that investing heavily in this mode, even at the expense of others (public transit, bicycle and pedestrian infrastructure), may be the best method of preserving the current quality of life. It is more prudent, however, to see electric and hybrid vehicles as part of a suite of solutions worth pursuit.

Bicycles

San Francisco is a bicycle-friendly city in a number of ways. While its topography does present some challenges, its relatively small size and year-round mild

climate allow residents to use bicycles to commute to work, conduct light shopping, visit friends, or simply ride recreationally. Cycling is also a very visible part of San Francisco's culture: for instance, the San Francisco Bicycle Coalition now claims over 10,000 members, and on the most recent Bike to Work Day, Market Street had more bicycle traffic than car traffic during peak commute hours.

Bicycles are an excellent mode of transportation for a number of reasons, among them their energy efficiency. Requiring no fuel and able to make use of roads yet also be brought onto public transit, bicycles are versatile and efficient.

Pedestrians

Public Transportation

San Francisco's public transit system is generally efficient from an energy standpoint, and service is widespread. As important as current levels of service is the transit-first philosophy adopted decades ago by the City. However, the system suffers from overcrowding on a number of lines, and gas-price-induced ridership spikes in 2008 demonstrated that San Francisco can expect to see tremendous increases in passenger volume when fuel prices rise again.

Buses

MUNI Underground

BART

Recommendations:

San Francisco should educate consumers about the high costs of car ownership, the health and savings benefits of walking and bicycling, and the convenience of public transportation in an effort to encourage mode shift away from automobiles.

San Francisco should explore plug-in vehicles as part of city-run car sharing programs, but should wait to learn from the successes and failures of other city-wide plug-in-electric and fuel-cell vehicle programs before investing in any infrastructure for wide use of *privately owned* electric vehicles.

San Francisco should provide no direct artificial incentives to encourage the private purchase and use of fuel-efficient, hybrid, biofuel, entirely electric, or fuel-cell automobiles. In a hypothetical,

unlimited-resource environment, it might make sense to invest in the widest possible range of programs to increase fuel efficiency, including programs to encourage owners of conventional internal combustion-driven autos to switch to hybrid or other vehicles. However, by definition, a post-peak-oil environment will in fact be under significant resource restraints. San Francisco must adopt those programs which will result in the greatest benefit to both the City and its residents. The benefits of fuel efficiency are obvious, and in case any would-be car buyers do not understand this, automobile manufacturers will continue to advertise to consumers about the fuel efficiency of their vehicles, and the benefits of higher gas mileage. San Francisco need not invest in assisting auto manufacturers in this process, nor provide further incentives for residents to invest in the *most expensive transportation method available*. Instead, San Francisco should invest in those options which are guaranteed to provide reductions in petroleum use and increased resilience in the City's transportation networks: pedestrian- and bicycle-friendly sidewalks and streets, and world-class public transit.

San Francisco should enact the City's Bicycle Plan.

San Francisco should consider a bicycle-sharing program.