

Cities21



\$2 Daily Workplace Parking Charge + \$4 Cashout: Cut U.S Commutes VMT 23%: California State Legislative Proposal

Originally submitted to CA Senator Simitian's Nov '09 "There Ought to be a Law" Contest
August 1, 2010 Update

1. What's the problem that needs a legislative solution?

- The roads are clogged with commuters who spew too much CO2. To protect the climate, we must reduce driving.

2. What's your solution?

- To encourage energy-efficiency and reduce greenhouse gasses, businesses charge their solo-driving employees (who have been receiving subsidized parking) for parking and redistribute this revenue to their employees using greener alternatives. To that end:
- Mandate employers to charge workers \$2 per day to park at workplace parking spaces.
- Mandate employers to pay workers \$4 per day to not park at workplace parking spaces.
- Implement the solution in a gradual, business-friendly manner.

Policy / Implementation Summary:

This policy will be referred to below as "\$2 + \$4."

Why this policy is necessary:

Per the Moving Cooler report, we need to increase the cost/pain of driving and also increase incentives for alternatives in order to meet 2035 GHG reduction targets. Increasing the cost of driving makes transit/carpooling more competitive; accelerates the "vibrant, livable, energy-efficient transit village" movement; and makes long-commute sprawl less attractive.

If the cost of driving increases via other measures, then this policy is NOT necessary. Other equivalent measures include: \$5 per gallon increase in the gas tax; a \$400/ton carbon tax; and "peak oil" hitting with a vengeance, causing gas price to hit \$10 per gallon. Currently, there is zero political viability for a big gas tax increase or a large carbon tax, hence this complicated policy is required. The advantage of "\$2 + \$4" is that it has much higher political viability, as the policy has been designed to carefully tip-toe through a minefield of objections.

This policy has been developed and improved over 10 years, based on diligent research with employers, employees, transit agencies, parking experts, trip reduction experts, behavioral economists, and academics. This policy combines previous policies (By UCLA's Donald Shoup, etc) with some twists/innovations.

Policy explanation: What the concept is & why it is necessary to do it this way

This policy is targeted first (but not exclusively) at suburban job sites with their great expanses of free parking asphalt. Worldwide, these work sites are per-capita GHG villains. MTC (San Francisco

Bay Area's Metropolitan Planning Organization) has characterized increasing the cost/pain of driving to these areas "as the Holy Grail of trip reduction."

A "cashout" is an employer-provided incentive for employees to not park at their workplace. Incentives can be transit passes, cash, etc.

Begin with policy implementation at very large employers and gradually phase in smaller and smaller employers.

Begin with \$0.25 daily workplace parking charge with \$0.50 daily cashout. This minimal-cost first step is politically viable, whereas an immediate leap to \$2/day charge + \$4/day cashout would create riots. Gradually phase in charge and cashout increases every 4 months, bringing the charge from \$0.25 to \$2.00 over 32 months. This allows transportation alternative programs and transit to gradually expand to accommodate increased demand, rather than having one big, disruptive "shock" to the transportation system.

Employers are often big and profitable, but employee parking generally falls within under-funded Human Resources or Facilities Departments. Hence, employers demand zero new implementation costs in exchange for greening commutes. This demand eliminates the possibility of \$2 + \$4 implementation via "a person in a parking booth at the parking lot tracking which employees park at work." Instead, the policy defines how employees rapidly fill out a web form twice a month to report their commuting behavior. The web form data is then fed into the payroll system. The policy provides state funding for development of the web form software and payroll software changes. There are three main companies that provide payroll processing software: SAP, Oracle, and Paychex, and the amount of software development work that is required is small.

Employers object to a policy that entails a new annual cost, no matter how green. \$2 + \$4 is designed to be revenue-neutral to employers. Via the payroll processing system, employers collect parking revenue from parking and pay that revenue out to non-parking employees. The charge and cashout levels have been chosen to "break even" for employers, with the policy calling for mid-course adjustments if necessary to make the policy revenue neutral.

For downtown San Francisco commutes, the parking cost/pain is already well beyond \$2 + \$4, so the policy has no impact in these already-low-driving areas.

The short-term financial impact on employers is revenue neutral; the long-run impact of this policy spurs in-fill of underutilized parking lots. The policy specifies that such in-fill will receive CEQA (environmental analysis for real-estate development approvals) streamlining, similar to the streamlining in the SB375 Sustainable Communities Strategy (California transit villages policy to protect the climate). Such desirable in-fill will be extremely lucrative to the private sector (the parking lot land is already paid off), meaning that the policy's long-term financial impact is staggeringly profitable for in-filling employers. If 250 square feet of tradable development rights are granted for each commute permanently removed and if in-filled (already paid off) land generates \$400 in profit per square foot, then \$212B California in-fill profit is created. Hence, this policy is very business-friendly. Protecting the climate is not a "job killer" as some claim.

The policy is economically "progressive," a transfer of wealth from higher-income workers to lower-income workers. This is because higher income workers are far more likely to commute by solo driving than lower income workers.

The policy will not penalize low-income graveyard shift grocery/hospital workers and other low-

income workers who have few alternatives to driving. The policy appoints an implementation commission to develop "case law" to handle such cases. Environmental Defense has studied social equity impacts of policies to increase driving costs/pain. Their report concluded that exceptions have to be carved out of such policies to ensure social equity. This policy envisions fair, compassionate exceptions developed via a transparent process.

While it is abundantly clear that the policy will reduce commuting by 23%, the policy is sufficiently novel to prevent legislators from directly moving to full implementation. Hence a 16-month, three-company pilot program (with program efficacy evaluation) is required before "full implementation" begins. This pilot period will prove that the policy works, driving behavior changes, and unintended negative consequences are avoided.

Companies have expressed a fear that if they move first on the policy and other companies do not follow, then they will be at a recruiting disadvantage for hiring new staff. In response, the policy ensures that all US employees will be eventually covered by the policy, and requires that other states follow California's lead on the policy. Re-stated, Silicon Valley economic development requires that non-California US job centers adopt \$2 + \$4. The policy's implementation directs the governor/staff to persuade other states to follow California's lead. The policy postpones the phased pricing increases unless a specified number of states also adopt the policy.

Benefits

- CA commute VMT savings of 23% reduces 6.3M tons of CO2 per year. US savings is 51.7M tons of CO2/year.
- From the Findings and Declarations of SB518 (California Senator Lowenthal's parking bill), "Eliminating subsidies for parking has enormous potential to reduce traffic congestion and greenhouse gas and other vehicle emissions by reducing vehicle miles traveled. If drivers must pay the true cost of parking, it will affect their choices on whether or not to drive. In the short term, changes to parking policy can reduce traffic congestion and greenhouse gas emissions more than all other strategies combined, and they are usually the most cost-effective."
- Increase chances of meeting 2035 climate protection objectives (60% of 1990 emissions)
- In-fill for more efficient land use
- Social equity
- The policy will increase transit ridership by 50% for many routes, filling up empty seats on underutilized routes. This policy improves transit agency finances, saving important jobs.
- The policy fosters a larger voting constituency in favor of transit expansion
- By adding in more of the true cost of suburban parking, the policy makes urban downtown real-estate more competitive with suburbia

Notes:

- Many US jobs are "suburban." Suburban job sites may be characterized as "isolated within a zoned-only-for-employment area, with poor transit options." Shoup and others studied 1970s mandatory Southern California "pricing + trip reduction" policies for defense employers. These employers had similar isolated, poor-transit job sites. Shoup found a large commute shift away from SOV (single occupancy vehicle) to ridesharing. It should also be noted that 2010 "smartphone + social networking" ridesharing (Avego, nuride, Carticipate, ZimRide, GoLoco, etc) provides a vast improvement over the ridesharing landscape of the 70s.
- For US suburban, 80% SOV commute, auto-centered culture, there are some commuters with attractive commute alternatives and some with poor alternatives. Under the policy, those with poor alternatives continue to commute via SOV, while paying others to get out of their cars. In the long-run, the increase in price/pain of solo commuting motivates more folks to

change work and/or home location to obtain better commute alternatives.

- Sierra Club's California Nevada Regional Conservation Committee's Energy-Climate Committee has endorsed the policy. Silicon Valley Leadership Group (SVLG) and Association for Commuter Transportation (ACT) - Northern California Chapter have provided "supporting letters."

Policy Findings

- AB32 (California climate protection) 2020 GHG target is 1990 level. 2050 target is 20% of 1990 GHG level. Assuming that the AB32 GHG goal for 2035 is the midpoint between 2020 and 2050, then the 2035 AB 32 target is 60% of 1990 GHG. Per the Moving Cooler Report, we need some stiff driving pricing to achieve VMT (vehicle miles traveled) reductions to meet GHG targets for 2020 and 2035. Moving Cooler suggests \$5/gallon gas tax increase will reduce VMT by 28%. Moving Cooler points out that while electric vehicles (Betterplace, Tesla, etc) are virtuous, driving reduction is also essential. MTC, ABAG, and US Transportation Secretary LaHood back these conclusions.
- From the Findings and Declarations of SB518 (California Senator Lowenthal's parking bill), "Eliminating subsidies for parking has enormous potential to reduce traffic congestion and greenhouse gas and other vehicle emissions by reducing vehicle miles traveled. If drivers must pay the true cost of parking, it will affect their choices on whether or not to drive. In the short term, changes to parking policy can reduce traffic congestion and greenhouse gas emissions more than all other strategies combined, and they are usually the most cost-effective."
- While more complex combinations of cashout with other measures have significant appeal, simple parking cashout policies impose large new costs on employers without providing a significant GHG benefit. For suburban Bay Area employers, the daily cost per solo commute de-generated is \$26. The cost per ton CO2 removed is \$2,080. This is not cost-effective and such ineffective policies should be discouraged.
- Free solo driver workplace parking represents a perverse incentive to encourage solo commuting. The subsidy for free parking at Pleasanton workplace parking lots is \$7.59 per day per solo driver.
- Former MTC Senior Planner James Corless: "charging for parking in suburbia is the Holy Grail of driving reduction."
- Recent parking laws (SB728, SB425, and proposed SB518) begin to overturn the perverse subsidy for solo commuting. While virtuous, none of these laws offers to reduce more than 100,000 tons of GHG per year. As Rebecca Long's (currently she is MTC's Legislative Analyst) 2002 state legislative analysis of CA parking cashout law states: "Even if the law is fully enforced, it was written so narrowly that it only affects a small number of employers: those with 50 employees or more and those who lease, rather than own, their employees' parking spaces. Employer-owned parking spaces—which account for 84 percent of all free parking spaces in the state—are exempt from the law. Of the 11 million free parking spaces in the state, the Legislative Analyst's Office estimates only three percent, or 290,000, fall under the parking cash-out law."
- The projected significant CA VMT reduction provides an additional \$6B per year in benefits beyond GHG reduction from reduced accidents (resulting in insurance cost savings), reduced congestion, reduced local pollution (particulates, etc), improved health, and reduced foreign oil dependence. [Calculations based on VMT reduction benefits from the Brookings Hamilton Project Pay-as-you-drive (PAYD) auto insurance Report.]
- The policy shall be revenue-neutral to businesses in the short run. There shall be no net cost to employers. Employers shall use parking charge revenue to fund parking cashout.
- In the long run, the policy will significantly reduce solo commuting (by 23%), creating a large,

profit-increasing real-estate benefit for employers. Virtuous employers shall benefit from reducing commuting GHG.

- The projected large shift in commuting patterns will accelerate further the current high tech ridesharing / carpooling innovation explosion using iPhones, Google Android phones, and social networking. Services include: Google RideFinder, Avego, Carticipate, Piggyback, ZimRide, GoLoco, nuride, and Goose Networks, to name but a few. In addition, commute pattern shift will accelerate intelligent transportation smart parking innovation, exploiting ad-hoc networks, sensor meshes, and other advanced Silicon Valley technologies. Because CA will be a “first mover” among the 50 states, CA will have a “home market” advantage in developing commute-reducing cleantech. Such a cleantech lead will be advantageous for selling CA technology to other states as they follow CA’s leadership to eventually adopt this policy.
- The projected large shift in commuting patterns will increase transit ridership, bolstering transit agency finances.
- Most parking implementation policies for employers require significant implementation overhead, such as requiring a “man in a booth” at the parking lot entrance. By following Genentech’s web-based reporting scheme, this policy has none of the burdensome implementation cost.
- The proposed parking charge + parking cashout implementation will represent an economically progressive policy, a transfer of wealth from higher-income workers to lower-income workers. This is because higher-income workers are far more likely to commute by solo driving than lower income-workers.
- Commuting contributes 50% of individual VMT. Typical Bay Area commuting patterns are represented by the 17 major suburban job centers encompassing 594,000 jobs. Solo driving commute mode share is roughly 82%, with an 18-mile one-way commute. For details see: <http://www.cities21.org/BABPC/>
- US real-estate is “over-parked,” making real-estate more costly compared to Europe and Asia. This policy helps to level the playing field, making the US more competitive.
- By internalizing the negative economic externalities of climate degradation and traffic congestion, the policy makes the commuting and real-estate markets more efficient. Re-stated, the policy brings about freer markets (better Capitalism).
- From the Findings and Declarations of SB518 (Senator Lowenthal), “Eliminating subsidies for parking has enormous potential to reduce traffic congestion and greenhouse gas and other vehicle emissions by reducing vehicle miles traveled. If drivers must pay the true cost of parking, it will affect their choices on whether or not to drive. In the short term, changes to parking policy can reduce traffic congestion and greenhouse gas emissions more than all other strategies combined, and they are usually the most cost-effective.”

Policy Principles

- Progress has been very slow on “inconvenient climate remedies:” raising the gas tax, congestion charging for Doyle Drive / NYC, Pay-As-You-Drive (PAYD) auto insurance, and watered down Cap and Trade. Business is concerned that this lack of progress will eventually lead to costly, draconian regulations. The proposed policy is business-friendly. It is also interesting to note how some 2008 presidential candidates “pandered” by promising to keep gas prices low when climate concerns require substantial gas price increases. It is further interesting that the November 2010 California election is grappling with whether climate protection is a “job killer,” when this proposal provides a large net economic benefit.
- Business favors gradual, incremental policy approaches that allow employee commute behavior and employer operations to accommodate change over a period of a few years, rather than “changing the world in one day.” Business believes that gradual commute modification will allow cleantech solutions, infrastructure capacity, commute alternative capacity, and HR

Payroll systems to smoothly reconfigure to better support the change.

- Kathryn Phillips of Environmental Defense advises: “States are hesitant to move unless the policy has been tried. You should get an employer or developer to try it first.” Michael Cunningham (Bay Area Council) and Graham Brownstein (Transform) also made the same recommendation. Hence implementation Months 1-16 provide a pilot program with end-of-program evaluation before widespread implementation.

Policy Implementation

This law must be **MANDATORY**, not voluntary. California’s pay-as-you-drive (PAYD) insurance regulations held the promise of reducing VMT by 8% (According to the Brookings Hamilton Project PAYD Report), but strong insurance industry lobbying made the regulations voluntary to insurance companies, eliminating the effectiveness of the policy. For details, please see:

http://switchboard.nrdc.org/blogs/jhorner/california_misses_a_big_chance.html.

State EDD (Employment Development Department) will implement the policy because they have an ongoing relationship with employers and already have employer headcount data. [EDD funding must be provided.] No funding will be provided to regions, but it is assumed that MPOs will assist in the implementation and training, because a 23% commute VMT reduction is needed to meet SB375 and AB32 objectives. Re-stated, this policy makes it much easier for MPOs to meet 2020 and 2035 VMT/GHG targets.

Employers will not have to “double pay” for parking cashout. When they provide other TDM employee benefits of the same or greater value, such as Commuter Check, transit passes, WiFi express bus service, employer-sponsored vanpool programs, “club buses,” etc., they will not also provide cashout.

At job sites where employees already pay for parking, these job sites are exempt from the policy. For example, in downtown San Francisco, employees pay upwards of \$10 per day to park.

The intent of this bill is to bring about large scale GHG reductions in CA and beyond, in an extremely cost-effective manner, while not disadvantaging CA suburban real-estate in comparison to other states. It is envisioned that this pioneering CA legislation will spread state-by-state to bring about nationwide GHG reductions of 52M CO2 tons per year.

As with SB375, land parcels where this policy is implemented shall qualify for CEQA streamlining equivalent to that of SB375. Such streamlining shall be available for land with unused parking spaces where either a) the parking charge reaches \$2 or b) the nominal change in solo driving from the first month of implementation to the current day reaches 15%. It is believed that this provision provides very significant real-estate value the business community, to the point where the policy will provide a substantial long-term profit to business. To re-state this point, it is believed that this policy proposal has a “negative cost” for business.

Pilot Policy Months 1-4

- A commission, the CA Charge Cashout Implementation Commission (CCCIC), shall be created to develop “case law” for exceptions. Commission members should include State Chamber of Commerce, Environmental Defense Fund (author of a social justice study on driving pricing), EDD, etc. Reasonable exceptions should be developed for low-income workers, shift workers, and workers with various special circumstances. The policy should be implemented in a manner that motivates the majority of commuters to adopt greener commuting behavior, while not penalizing those with disadvantages. The commission shall meet 4 or more times per year

and shall publish “case law” on the EDD web site.

- Rapidly issue a simple Request for Pilot Proposals (RFPP) for a few companies to pioneer the proposal before full implementation. Rapidly screen and select winning companies. See separate RFPP section below for details.
- In order to keep employer implementation cost extremely low, it is envisioned that weekly web-based employee self-reporting will be utilized by employers for implementation. More elaborate US DOT IntelliDrive (telematics, cleantech) parking and commute mode tracking technology should be encouraged, but is not required.
- Fund the development of Human Resources / Payroll processing software to implement web-based self reporting for Oracle, SAP, and generic HR processing. Oracle and SAP comprise the majority market share for payroll processing. HR processing software will automatically provide commuter behavior reporting to be collected, analyzed, and disseminated by Caltrans/CARB [Funding needed]. HR processing software will automatically enable reporting to EDD for enforcement. Reports include charge receipts vs. cashout payout, parking space utilization, commute mode share, SOV elasticity, and longitudinal trend report. HR Payroll software should support CCCIC “case law” / exception handling, by allowing employees and HR administrators to identify exceptions such as “I’m a graveyard shift worker, so I am exempt from this policy.”
- Fund the instrumentation of the HR Payroll software systems to provide quantified results data. Quantified reports shall be automatically sent to EDD each month. These reports shall include: a) charge receipts vs. cashout payout, b) parking space utilization, c) commute mode share, d) SOV (single occupancy vehicle) price elasticity, e) acres of parking freed by this policy, and f) longitudinal trend report.
- HR Payroll processing enablement will assist implementation of the policy on a pre-tax basis for employees. Commute benefits such as cashout may enter paychecks pre-tax up to the current federal \$230/month commute benefits cap.
- EDD will develop and undertake policy implementation employer outreach.
- At Month 4, parking lot access commute mode share counts (hand-counted at parking lot access points) will be taken at 3 large parking lots representing pilot employers. [Funding required] These counts shall be used to help gauge the efficacy of the policy implementation, by providing a “before snapshot.”

Pilot Policy Months 5-8

- At Month 5, pilot employers will implement \$0.25 (or greater) parking charges (per day) and \$0.50 (or greater) parking cashout (per day).
- At Month 8, Caltrans/CARB and EDD will make pilot participant GHG reduction reports available.

Pilot Policy Months 9-12

- At Month 9, pilot employers will implement \$0.50 (or greater) parking charges (per day) and \$1.00 (or greater) parking cashout (per day).
- At Month 12, Caltrans/CARB and EDD will make pilot participant GHG reduction reports available.

Pilot Policy Months 13-16

- At Month 13, pilot employers will implement \$0.75 (or greater) parking charges (per day) and \$1.50 (or greater) parking cashout (per day).
- At Month 15, Caltrans/CARB and EDD will make pilot participant GHG reduction reports available. Caltrans/CARB and EDD shall also prepare a legislative impact analysis and shall verify that adverse unintended consequences are avoided. The state shall prepare policy modification recommendations to the legislature as appropriate to fine-tune the implementation.

Review and comment from CCCIC shall be made.

- As part of the Month 15 review, staff shall recommend whether to proceed to full implementation or whether to freeze/modify the policy.
- At Month 16, parking lot access commute mode share counts (hand-counted at parking lot access points) will be taken at 5 large parking lots representing 5 different large employers. [Funding required] These counts shall be used to help gauge the efficacy of the policy implementation, by providing a “before snapshot.”

Policy Months 17-20

- At Month 17, pilot employers will implement \$1.00 (or greater) parking charges (per day) and \$2.00 (or greater) parking cashout (per day).
- At Month 17, public and private sector employers with 2,000 or more CA employees must implement \$0.25 (or greater) parking charges (per day) and \$0.50 (or greater) parking cashout (per day).
- At Month 18, the names of all non-complying employers will be published. [Shaming]
- At Month 19, monthly fines shall be imposed for non-compliance. The monthly fine shall be the equivalent of “100% cashout,” calculated as {daily parking cashout amount} times {number of workdays in the month} times {number of workers}. This will ensure that it is far less expensive to comply with the policy than to fight the policy. [Enforcement]
- At Month 20, Caltrans/CARB and EDD will make GHG reduction and compliance reports available.
- At Month 20, the Governor shall direct state activities to promote this climate protection policy beyond state borders. [Funding required] For example, CA Governor Schwarzenegger undertook many high-visibility trips outside of the state in promoting California’s climate protection efforts worldwide. Presentation to the National Governors Association is advised.

Policy Months 21-24

- At Month 21, pilot employers will implement \$1.25 (or greater) parking charges (per day) and \$2.50 (or greater) parking cashout (per day).
- At Month 21, public and private sector employers with 2,000 or more CA employees must implement \$0.50 parking charges and \$1.00 parking cashout.
- At Month 21, public and private sector employers with 500 or more CA employees must implement \$0.25 parking charges and \$0.50 parking cashout.
- Shaming and enforcement will continue in a similar manner to that found in Months 18 & 19 above.
- At Month 24, Caltrans/CARB and EDD will make GHG reduction and compliance reports available
- The Governor shall continue to direct state activities to promote this climate protection policy beyond state borders. [Funding required]

Policy Months 25-28

- At Month 25, pilot employers will implement \$1.50 (or greater) parking charges (per day) and \$3.00 (or greater) parking cashout (per day).
- At Month 25, public and private sector employers with 2,000 or more CA employees must implement \$0.75 parking charges and \$1.50 parking cashout.
- At Month 25, public and private sector employers with 500 or more CA employees must implement \$0.50 parking charges and \$1.00 parking cashout.
- At Month 25, public and private sector employers with 200 or more CA employees must implement \$0.25 parking charges and \$0.50 parking cashout.
- Shaming and enforcement will continue in a similar manner to that found in Months 18 & 19 above.

- At Month 28, Caltrans/CARB and EDD will make GHG reduction and compliance reports available. Caltrans/CARB and EDD shall also prepare a detailed legislative impact analysis and prepare policy modification recommendations to the legislature as appropriate to fine-tune the implementation. Review and comment from CCCIC shall be made. The charge:cashout ratio in this policy is 1:2. It is allowable for the charge to be increased by up to 25% to attain employer breakeven, based on quantified reports received.
- The Governor shall continue to direct state activities to promote this climate protection policy beyond state borders. [Funding required]
- By Month 28, the state shall obtain commitments from 3 (or more) out of the top 25 population states to implement similar policies. If such commitments cannot be obtained, then the top parking charge shall be frozen at \$0.75 and the top cashout shall be frozen at \$1.50 until this occurs. It is crucial that CA real-estate not be disadvantaged in comparison to other states that may not share CA's concern for protecting the long-term interests of future generations. It is understood that the 3 states will begin implementation lagging behind CA, but will eventually catch up to CA's high level of environmental commitment. While complex, it is believed that this "policy trigger" will be required to obtain Business buy-in.

Policy Months 29-32

- At Month 29, pilot employers will implement \$1.75 (or greater) parking charges (per day) and \$3.50 (or greater) parking cashout (per day).
- At Month 29, public and private sector employers with 2,000 or more CA employees must implement \$1.00 parking charges and \$2.00 parking cashout.
- At Month 29, public and private sector employers with 500 or more CA employees must implement \$0.75 parking charges and \$1.50 parking cashout.
- At Month 29, public and private sector employers with 200 or more CA employees must implement \$0.50 parking charges and \$1.00 parking cashout.
- At Month 29, public and private sector employers with 20 or more CA employees must implement \$0.25 parking charges and \$0.50 parking cashout.
- Shaming and enforcement will continue in a similar manner to that found in Months 18 & 19 above.
- At Month 32, Caltrans/CARB and EDD will make GHG reduction and compliance reports available.
- The Governor shall continue to direct state activities to promote this climate protection policy beyond state borders. [Funding required]
- By Month 32, the state shall obtain commitments from 10 (or more) out of the top 25 population states to implement similar policies. If such commitments cannot be obtained, then the top parking charge shall be frozen at \$1.00 and the top cashout shall be frozen at \$2.00 until this occurs.

Policy Months 33-36

- At Month 33, pilot employers will implement \$2.00 (or greater) parking charges (per day) and \$4.00 (or greater) parking cashout (per day).
- At Month 33, public and private sector employers with 2,000 or more CA employees must implement \$1.25 parking charges and \$2.50 parking cashout.
- At Month 33, public and private sector employers with 500 or more CA employees must implement \$1.00 parking charges and \$2.00 parking cashout.
- At Month 33, public and private sector employers with 200 or more CA employees must implement \$0.75 parking charges and \$1.50 parking cashout.
- At Month 33, public and private sector employers with 20 or more CA employees must implement \$0.50 parking charges and \$1.00 parking cashout.
- At Month 33, public and private sector employers with CA employees must implement \$0.25

parking charges and \$0.50 parking cashout.

- Shaming and enforcement will continue in a similar manner to that found in Months 18 & 19 above.
- At Month 36, Caltrans/CARB and EDD will make GHG reduction and compliance reports available. Caltrans/CARB and EDD shall also prepare a detailed legislative impact analysis and prepare policy modification recommendations to the legislature as appropriate to fine-tune the implementation. Review and comment from CCCIC shall be made. The charge:cashout ratio in this policy is 1:2. It is allowable for the charge to be increased by up to 40% to attain employer breakeven, based on quantified reports received.
- The Governor shall continue to direct state activities to promote this climate protection policy beyond state borders. [Funding required]
- By Month 36, the state shall obtain commitments from 25 (or more) states to implement similar policies. If such commitments cannot be obtained, then the top parking charge shall be frozen at \$1.25 and the top cashout shall be frozen at \$2.50 until this occurs.

Months 37-96

- The policy shall continue to spread in an incremental manner, following the implementation pattern of months 17-36.
- A top parking charge of between \$2 and \$3 is envisioned. A top cashout amount of \$4 is envisioned.

Charge/Cashout timeline:

Months	pilot	>2K emps	>500 emps	>200 emps	>20 emps	1-19 emps
5-8	\$0.25/\$0.50					
9-12	\$0.50/\$1.00					
13-16	\$0.75/\$1.50					
17-20	\$1.00/\$2.00	\$0.25/\$0.50				
21-24	\$1.25/\$2.50	\$0.50/\$1.00	\$0.25/\$0.50			
25-28	\$1.50/\$3.00	\$0.75/\$1.50	\$0.50/\$1.00	\$0.25/\$0.50		
29-32	\$1.75/\$3.50	\$1.00/\$2.00	\$0.75/\$1.50	\$0.50/\$1.00	\$0.25/\$0.50	
33-36	\$2.00/\$4.00	\$1.25/\$2.50	\$1.00/\$2.00	\$0.75/\$1.50	\$0.50/\$1.00	\$0.25/\$0.50
37-40		\$1.50/\$3.00	\$1.25/\$2.50	\$1.00/\$2.00	\$0.75/\$1.50	\$0.50/\$1.00
41-44		\$1.75/\$3.50	\$1.50/\$3.00	\$1.25/\$2.50	\$1.00/\$2.00	\$0.75/\$1.50
45-48		\$2.00/\$4.00	\$1.75/\$3.50	\$1.50/\$3.00	\$1.25/\$2.50	\$1.00/\$2.00
49-52			\$2.00/\$4.00	\$1.75/\$3.50	\$1.50/\$3.00	\$1.25/\$2.50
53-56				\$2.00/\$4.00	\$1.75/\$3.50	\$1.50/\$3.00
57-60					\$2.00/\$4.00	\$1.75/\$3.50
61-64						\$2.00/\$4.00

Request for Pilot Proposals (RFPP)

Sample RFPP outline:

**State of California Request for Pilot Proposals (RFPP):
\$3M to eliminate your company's free parking**

If your company has 300 or more employees with free workplace parking, the state will pay up to \$3M to eliminate your free parking policy. To eliminate free parking, your company will do the following:

- A "parking cashout" is an employer-provided incentive for employees to not park at their

workplace. Incentives can be transit passes, cash, etc.

- January 2011: Charge SOV-commute employees \$0.25 (or greater) per day to park at the workplace. Provide \$0.50 (or greater) per day cashout to employees utilizing commute alternatives.
- May 2011: Increase the charge & cashout to \$0.50 and \$1.00, respectively.
- September 2011: Increase the charge & cashout to \$0.75 and \$1.50 respectively.
- Your company’s implementation costs for tracking employee commute behavior and modifying payroll processing will be covered.
- Side effects of implementation, such as “parking spillover into adjacent residential streets” will be effectively addressed.
- Starting January of 2012, other companies will be required to follow your company’s lead in eliminating free parking (based on a state legislative mandate). Within California, employees will not be able to avoid eliminating free parking. The question is: “Will your company pioneer the policy 12 months in advance of widespread implementation?”
- Assuming that your free workplace parking commuters begin at 80% or 75% SOV commute mode split, the 12 months of 2011 revenue that your company takes in from parking charges will cover outlays for cashout. Companies can also provide more than the minimum daily cashout to employees.
- Associated tasks to be performed by pilot companies include interviewing employees about the policy implementation as it progresses, reporting results to the state, and presenting on the policy at conferences. Your company can expect to obtain favorable “sustainability/green” media coverage.

Submission Information

Amount requested: _____ (\$3M maximum)

Number of free parking employees: _____ (your company is encouraged to include US employees outside of California)

If your charges and/or cashout will be greater than standard, please explain: _____

Company contact info: _____

RFPP Notes

- Submissions will be primarily (but not exclusively) judged based on “cost per employee,” equal to “amount requested” divided by “number of free parking employees.” IE the state will look to maximize the number of employees covered in the pilot
- As part of the rapid RFPP process, the state expects to discuss implementation details with submitting companies, as part of verifying implementation readiness.

Some thoughts on CCCIC “Case Law” / Exception Handling:

- Go hardest after peak hour day shift commuters who work at large job sites or in local areas with a large concentration of jobs. For example, the school district headquarters should bear the full brunt of the policy, but staff at small elementary school in the middle of a residential

district should receive easy treatment.

- Go easy on swing and graveyard shift workers, and on part time workers. Go hard on the manufacturing plant day shift. Go hard on day shift hospital workers.
- Go relatively hard on transit/transportation agency employees, because the agency should serve as an example.
- Workers that don't park should be exempt: taxi cab company workers (except for HQ staff) and home health care workers (except for HQ staff) come to mind.
- Go hard on large concentrations of seasonal amusement park workers. Disney is sincere in their TDM efforts and this policy should assist those efforts.
- This item represents an extremely fine point about the ability of CCCIC to flexibly address special cases with reasonable "case law." Locations with existing parking pricing, such as San Francisco, have low solo driving commute mode share (43%). Just about all locations with free workplace parking have solo driving commute mode share above 75%. Should there arise a free parking "outlier" location with solo commute mode share between 70% and 50%, then the "charge/cashout breakeven point" is different than that for 75% SOV commute locations, and special "case law" could be developed for these locations, adjusting the charge/cashout ratio to bring about breakeven. Such "60% solo" areas will typically be located at the edge of areas that charge for parking, so the implementation of relatively higher charges in relation to cashout should be relatively more palatable.
- One way to "go easy" on a set of workers would be to push implementation for that set into the future by, for example, 24 months.
- Warns Tom Rubin (<http://reason.org/authors/show/thomas-a-rubin>), "Be aware that, in many cases, a State Statute will not override a bargaining unit agreement. If there is a labor union contract in place, and this bill passes into law, it is most certainly not automatic that will impact represented workers, at least not until the contract expires and a new one goes into place. The details get very involved, but, the short version is, do NOT assume that this will automatically apply to represented employees." Hence case law such as the following might be necessary: "If a union contract is in place that supersedes this law, then the ability to implement this law shall be negotiated into the next contract." However, a) it is not clear whether this truly is an issue, b) unions seem to be very enthusiastic participants in the green movement.

Early Budget Comments:

Funding could be provided from state transportation funding, as this policy is many times more cost-effective than capacity expansion projects.

Some budget items:

- \$9M payout to pilot employers
- \$100K for software integration with the two main HR software apps (Oracle and SAP). Employee web data entry feeds into payroll. Reports include charge receipts vs. cashout payout, parking space utilization, commute mode share, SOV elasticity, and longitudinal trend report. Make source available.
- \$100K to develop a generic employee self-reporting web applet that produces a data set for easy integration into various HR systems. Make source available & support integration.
- \$100K for "customer" support, policy analysis, communications, overhead, selected employer "hand measured" parking lot commute mode share / car count studies to calibrate behavior change, etc.
- The budget for Guaranteed Ride Home programs should be increased.
- When parking charges are implemented, there is a chance that cars that are normally parked at a workplace may be parked on adjacent residential streets. This is known as spillover

parking. One remedy for such occurrences is to implement residential permit parking schemes. The initial imposition of \$0.25 per day parking charges is not expected to create much immediate parking spillover. This bill could create a small pool of funds to assist localities in adopting residential permit parking and could further aid by developed model policies.

- Staff time for Caltrans, CARB, and EDD.
- EDD information technology.

Supporting Academic Paper:

- A 16-page academic paper follows the legislative proposal in this combined 34-page document.

Cities21

Palo Alto-based Cities21 is the US Environmental Protection Agency Collaborative Sustainability Network STAR grant recipient for the *Transforming Office Parks into Transit Villages Study* for Pleasanton, CA. One study output was the \$2 charge + \$4 cashout scheme.

November 10, 2009

The Honorable Joe Simitian
California State Senate - District 11
State Capitol, Room 2080
Sacramento, CA 95814

Re: \$2 Daily Workplace Parking Charge + \$4 Cashout

Dear Senator Simitian,

We hope you'll give favorable consideration to the \$2 Daily Workplace Parking Charge + \$4 Cashout proposal by Steve Raney, Cities21, a Silicon Valley resident, in your invitational contest for constituents' ideas "There Ought to Be a Law".

California must somehow price parking to have any chance against global warming. We like the fact that this Cities21 proposal for employee parking targets reduced driving as major component of GHG reduction following the "Moving Cooler" report.

We particularly appreciate that the charges pay for the cashout and that the policy is applied in gradual increments. We believe that, from a political standpoint, it is exceedingly difficult to price driving or parking. The cheaper we can start, the better. Hence we believe the small initial price envisioned in this policy makes sense.

We also like the policy being mandatory and not voluntary. We also appreciate how it handles exemptions. Other interesting features include the low implementation cost and the negative cost to business when real estate is factored in.

It is our understanding that the trust-based web self-reporting approach can be robust to privacy concerns, especially when compared to techniques that may identify the time a person is at a particular location, such as parking access to a building.

Sincerely,

Edward A. Mainland
Co-Chair, Energy-Climate Committee (CNRCC-ECC)
Sierra Club California Nevada Regional Conservation Committee (CNRCC)





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Lisa Adamos
Board Member at Large

Matt Wood
Past President

May 28, 2010

Mr. Steve Raney
Cities 21.org

Dear Steve:

Re: Letter of Support to participate in the development of parking policies

Parking management will be one of the key strategies by which California reduces Vehicle Miles Traveled (VMT) to meet statewide greenhouse gas reduction mandates over the next two decades.

Parking is an integral factor in transportation mode choice. Readily available, free or highly subsidized parking at employee centers and retail/entertainment destinations encourages SOV travel, even when there are other, high quality mode choices available.

Recognizing the importance of parking management in tomorrow's "smart communities" which not only achieve environmental goals but thrive economically, are sustainable and offer a high quality of life, we support the development of sound parking management policies.

We believe parking management policy can benefit both consumers and businesses with real time and monetary savings while, at the same time, work to achieve environmental goals.

The transportation demand management and transit professionals, planners, employers and others who will be responsible for implementing policy must be included in the process of policy development to ensure widespread support and practical viability of any such legislation.

The Northern California ACT Chapter feels it essential that organizations such as ours be actively engaged in the development of responsible parking management legislation for California, since the success of new policies will require both our support and our ability to implement them.

Thank you,

Sincerely,

Connie McGee

Connie McGee
President



224 Airport Parkway, Suite 620
San Jose, California 95110
(408)501-7864 Fax (408)501-7861
www.svlg.net

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Applied Materials

Established in 1978 by

DAVID PACKARD

October 27, 2009

The Honorable Joe Simitian
California State Senate - District 11
State Capitol, Room 2080
Sacramento, CA 95814

Re: Parking Reform

Dear Senator Simitian:

Thank you for your leadership in the State Legislature. We appreciate all you have done for the community. I am writing today regarding a legislative idea on parking reform that may be proposed by a Silicon Valley resident through your "it ought to be a law" contest.

By way of background, the Silicon Valley Leadership Group, founded in 1978 by David Packard of Hewlett-Packard, represents more than 300 of Silicon Valley's most respected employers on issues, programs and campaigns affecting the economic health and quality of life in Silicon Valley, including transportation, education, economic vitality and the environment. Leadership Group members collectively account for more than 250,000 local jobs, or one of every four private sector jobs in Silicon Valley.

The Leadership Group is a strong supporter of AB 32 and SB 375 and we firmly believe a component to addressing the climate challenge will be reducing vehicle miles traveled. A method that may have a significant effect on the amount people drive is to change perceptions about the cost and ease of parking vehicles in the community.

To that end, the Leadership Group is very interested in working with you and your Senate colleagues to develop model legislation incorporating a range of innovative parking policies. Our goal is threefold:

1. Develop flexible parking reform options that meet the needs of local jurisdictions and businesses alike.
2. Propose an incremental approach to parking reform that underscores the need for gradual behavioral and operational changes.
3. Only consider policies that are fiscally prudent for the state, local government and business.

If you have any questions regarding our position on parking reform, you and your staff are welcome to contact me at (408) 501-7851 or pskinner@svlg.net. Many of our member companies have a wealth of experience and data relating to parking policy and I would be more than happy to facilitate conversations with them to help us achieve our mutual goals.

Sincerely,

Peter Skinner
Senior Director of Transportation

**Academic Paper:
\$2 Daily Workplace Parking Charge + \$4 Cashout: Cut U.S. Commute VMT 23%**

Updated Version: August 1, 2010

- This paper was invited by the committee chair for presentation at the Transportation Research Board (TRB) Conference, Transportation Demand Management Committee ABE50 (trip reduction) Meeting, Jan 14, 2009.
- Paper presented at the Innovations in Pricing of Transportation Systems Conference. May 13-14, 2010, Orlando, FL.
- Paper presented at the Association for Commuter Transportation (ACT) International Conference, August 30, 2010.

This paper addresses TRB TDM themes such as: TDM and climate change, TDM climate messages to travelers (workers), Regional expectations for TDM – realistic targets, Land use plans / smart growth: in-fill, TDM benefits (and debate) with non-technical audiences, Impact of parking pricing on demand, Acceptability of parking management strategies, and Cost/benefits of TDM.

Author: Steve Raney
Cities21, Palo Alto, CA
cities21 at cities21 dot org
First working paper: October 2006.

ABSTRACT: (349 words)

This congestion pricing policy offers large driving/CO₂ reduction similar to a \$5 per gallon gas tax increase, in a more politically palatable manner. Past efforts to convert free workplace parking to charged or cashout have not flourished. A "cashout" is where the employer pays employees not to park at the office. This new scheme begins with \$0.25/day charge and \$0.50/day cashout. Charges/cashout increase over time to \$2/\$4 as more companies adopt the scheme, addressing the previous recruiting/retention objection. Trust-based, self-reporting enables very low-cost implementation, addressing the previous cost objection. The scheme is marketed to workers as a climate-protecting measure. Potential U.S. commute VMT savings is 23%, reducing 51.7M tons CO₂/year. Compared to past efforts, this scheme uses a) collective, phased action to overcome the Tragedy of the Commons, b) simultaneous charge and cashout, c) trust-based reporting, and d) monetization of saved parking spaces. A company that voluntarily implements this scheme risks productivity-reducing internal employee strife between climate protectors and climate skeptics. To address this objection, a "least- worse alternative" state-level meta-strategy is proposed.

A California state legislative proposal is provided, highlighting: State Employment Development Department monthly commute mode change data collection from employers, payroll software changes to processors (Oracle, SAP, Paychex), enforcement, policy phasing conditioned on adoption by other states, environmental streamlining for virtuous employers, and exceptions "case law" development via an implementation commission. Particular scrutiny is given to implementation costs. Public resistance to other driving reduction policies is analyzed. The legislative proposal includes Sierra Club and tech business lobby endorsements.

This policy research is informed by behavioral psychologists, listserv communities of practice, and advocacy to nine large Silicon Valley employers. A web-based employee survey was developed to understand qualitative issues associated with the scheme. The survey presented the scheme as a policy debate, with pros and cons. Responses identified special cases in need of clarification and provided colorful and useful comments from the extreme ends of the response spectrum.

Especially for suburban commutes, the projected large shift in commuting patterns will accelerate further high tech ridesharing / carpooling innovation using smartphones and social networking.

1. THE CHARGE + CASHOUT SCHEME

The proposed new scheme will be referred to as “charges + cashout.” Anonymizations are used to help protect careers.

Past efforts to convert free workplace parking to paid parking (or to apply parking cashout) in the U.S. have not flourished. Past efforts have not spread widely to create a significant shift away from single occupancy vehicle (SOV) commuting. This scheme differs from past efforts.

Summary:

- Start with \$0.25 per day employee parking charges and \$1.00 per day employee cashout. A cashout is where the employer pays employees not to park at the office.
- SOV employees are assured that all parking charge revenue collected goes to fund cashout.
- Charges and cashout increase gradually over time (to \$2.00 and \$4.00 per day) as other companies adopt the same program, ensuring that no Human Resources (HR) recruiting/retention disadvantage is created. (If Company A and Company B are competitors, and if A charges \$2 for parking and B has free parking, then B has a "\$2 per day" recruiting advantage over A. Hence, both A and B have to participate for the proposal to work.)
- Implement monthly employee reporting via a trust-based, self-reporting HR web applet (one Bay Area company uses this approach). Incorporate other employer commute benefits into this monthly reporting (Commuter Check - pre-tax transit passes, private WiFi express bus service, etc) to ensure that “double benefits” are not provided to employees. Self-reporting makes implementation very low-cost for employers. The company reports that 20% of employees are under-collecting the cashout, validating that company's trust in its employees.
- Position “charges + cashout” as part of a comprehensive employer commute reduction program. Educate employees about the unique behavior-changing/demand-reducing properties of parking charges (23% commute mode shift is expected with the largest shift going to carpooling). Besides reducing CO2, this scheme will: a) ease severe parking shortages at some office campuses, b) create real-estate in-fill opportunities (by permanently reducing cars parked at offices, this scheme enables smart new in-fill on land that was considered to be "built out"), and c) motivate cities to reduce parking maximums for new office development.
- Parking spaces take up valuable land. Employers have to pay for parking space land used by drivers. Employers save money when workers commute via green alternatives (transit, car/van pool, bike, walk, and telecommute) that do not require land for cars. Hence, Bay Area employers provide a hidden \$7.59 daily subsidy to SOV commuters [1. Subsidy]. This cashout + charges scheme reduces land consumption, increasing the economic efficiency of employers. Further, the current policy of subsidizing SOV commuting harms the environment.
- Cities are hard-pressed to meet climate protection and traffic reduction objectives. Because the cashout + charges scheme is so very effective compared to other policies, cities should reward employers that provide leadership on this scheme. "Charging for parking is the single most effective strategy to encourage people to use alternatives to the SOV" - Jeff Tumlin, Nelson Nygaard Associates.
- Many companies and cities can cooperate to spread cashout + charges nationwide, reducing 51.7M tons CO2 per year. See Table 1 below:

	Bay Area	CA	USA
2007 population	6,000,000	37,000,000	300,000,000
50% of residents work, 50% in offices	1,500,000	9,250,000	75,000,000
23% office worker parking reduction	345,000	2,127,500	17,250,000
CO2 tons/yr saved (3 per commute shifted)	1,035,000	6,382,500	51,750,000
VMT reduced/yr @ 6,000 mi/commute	2.0B	12.7B	103.5B
acres of parking freed	2,608	16,080	130,378
new land value created @ \$3M/acre	\$7.8B	\$48.2B	\$391.1B

Table 1: CO2 Savings

Compared to past schemes, this proposal relies on four innovations:

- Collective, phased action to overcome the Tragedy of the Commons
- Simultaneous charges and cashout, with parking charge transfer payment from SOV commuters to greener commuters
- Trust-based monthly self-reporting
- Cities enable real-estate benefit for virtuous employers.

Careful effort has been taken to make this scheme palatable to employers. Past objections have been addressed. By adding in real-estate benefits, the financial outcome for employers will be either positive or neutral.

2. WHY WORKPLACE PARKING REDUCTION IS NECESSARY

Berkeley Professor Robert Cervero states, "Parking lot laden office parks are one of our biggest blights, but they also represent our largest opportunity for in-fill development because of their inefficient use of land."

At the 2005 Congress for New Urbanism Conference, Peter Calthorpe stated, "We New Urbanists didn't focus on the growth of office parks. This was a huge mistake. We need powerful strategies for these job centers." Also at that conference, UCLA Professor Donald Shoup stated, "Parking lots within our office parks represent a 'land bank.' Office parks can be transformed in ways that few people now envision."

Bay Area Metropolitan Planning Commission staffer James Corless indicated that "workplace parking charges are the "Holy Grail of VMT (Vehicle Miles Traveled) reduction," but are exceedingly hard to achieve.

Urban Land Institute's Growing Cooler report states, "the projected 48 percent U.S. increase in the total miles driven between 2005 and 2030 will overwhelm expected gains from vehicle efficiency and low-carbon fuels." [2. Growing Cooler] Hence, what is needed is a large commute mode shift away from SOV commuting, where large is defined as greater than 10%, and the target is about 23%.

3. CONGESTION CHARGING AND CASHOUT EXPECTATIONS

Parking charges are a part of many U.S. metropolitan downtowns. San Francisco's SOV commute mode share is less than 50%, and parking charges (and hassle) play a large part in the low use of solo commuting. If parking charges are applied to free-parking workplaces, then SOV commute share will go down dramatically. SOV commuting employees will lose financially, seeing a portion of their income lost to charges. Hence, these SOV employees will strongly resist the elimination of free parking. If employers collect the charge revenue, then they gain financially.

If a state were to impose a parking tax payable by employers (increasing government revenue), the resultant commute mode shift would be similar to parking charges. Employers will resist this new expense. Assuming the employer attempted to shift some of the tax to employees, then the same strong SOV employee resistance would apply.

Cashout is not effective. One suburban Bay Area employer (who we will call "Employer X") has a severe parking shortage, so pays employees \$4 per day to not park. Cashout is a "carrot," a benefit used to motivate commuting behavior change. Employer X's \$4 per day cashout program has reduced SOV commute mode share from 78% to 74%. Before cashout, Employer X had 22% green commutes (walk, bus, train, telecommute, carpool, etc). To implement cashout, Employer X had to pay the existing 22% green commuters \$4 per day (out of fairness) before motivating 4% new green commuters. Hence, the cost per day per new green commute at Employer X is \$26 per day. Calculations are shown in Table 2 below. This is not a cost-effective way to reduce SOV commuting, nor does it achieve "large" mode shift.

\$4 cashout example. "Before" mode split is 78%. "After" mode split is 74%
We use 100 employees simplify the mathematics

\$4 cashout paid to 22 existing green employees	\$88
\$4 cashout paid to the 4 employees who change modes because of cashout	\$16
total cashout payout	\$104
Cost of program per new green commuter =	
total cashout payout / 4 employees	\$26

Table 2: Employer X Cashout Calculation

One TDM consultant commented, "The cost problem with parking cashout is that you have to grandfather in all the existing green commuters before you can entice new green commuting. Cashout is a very expensive TDM measure." A State of California TDM staffer commented, "Cashout cannot be easily done. California's cashout law unfortunately has limited applicability. Cashout, where you have to grandfather all the existing green commuters, is not cost-effective."

This paper will argue that an equivalent level of charges + cashout can provide the same mode shift as a pure charge, but with more political acceptability. With charges + cashout, SOV employees lose financially, but less than through a pure charges regime. Charges + cashout represents a transfer payment from SOV employees to commuter alternative takers.

These arguments are summarized in Table 3 below:

Winners & Losers	govt	employer	employee: SOV	employee: non-SOV	mode shift
\$6/gal gas tax increase	W		L	carpool L	23%
\$0.25/mi road price	W		L	carpool L	23%
\$6/day cordon charge	W		L	carpool L	23%
\$6 parking charge, employer keeps revenue		W	L	carpool L	23%
\$6/day/worker parking tax, easy-on employer implementation	W		L	carpool L	23%
\$4 cashout		L		W	4%
\$2 charge + \$4 cashout			small L	W	23%

Table 3: congestion pricing policies: winners & losers

One common employer objection to parking charges is "we can't penalize employees," but, free-parking workplace TDM cannot be cost-effective and cannot produce a large mode shift without a penalty such as a charge. Free-parking workplaces cannot get below 70% SOV mode share (except Google and Microsoft get down to about 62% SOV, but with a high cost per SOV commute de-generated that is not replicable by other, less-profitable US companies).

4. BEHAVIORAL IRRITANTS AND 23% COMMUTE REDUCTION

There is an intuitive psychological theory as to why cashout is not very effective. High-paid office workers ignore small-benefit programs such as \$4 per day cashout. This "carrot" is not a sufficiently large motivator to cause commuting behavior to change. Employees will not think about the cashout on a regular basis. We believe that parking charges will "irritate" SOV commuters. These SOV commuters will think about the parking charges every day they commute. Eventually this irritant gnaws at them long enough to cause many to change behavior. Changing commuting mode choice is a significant decision because of relatively high

barriers to changing away from the convenience of driving alone. This difficult decision is not a "snap decision" and may require pondering over many weeks. The same \$ value of irritant/stick has a much higher impact than the same \$ value of cashout/carrot. The intuitive theory is well substantiated from both field results and from "behavioral economics" research:

A 1989 study found that commute carrots are less effective than sticks: "A program of transit and vanpool subsidies as well as preferential parking for carpoolers had little effect until Twentieth Century Corporation in Los Angeles raised the price of employee parking from no charge to \$30 per month for solo drivers. Solo driving decreased from 90 to 65 percent after pricing." [3. Willson]

A 1990 paper found that charges changed behavior where incentives had not: "CH2M Hill in Bellevue, Washington began charging solo drivers \$40 per month for parking, the amount the company pays the building owner for parking. All employees receive a \$40 per month travel allowance in their paychecks. Carpoolers park for free. Walkers, cyclists and drop offs keep the travel allowance. Solo driving declined from 89 percent to 64 percent after the parking policies were put into place." [4. Symposium]

Best Workplaces for Commuters compiled a spreadsheet with 41 TDM case studies. The case studies measure the "number of parking spaces freed per 1,000 workers" – the equivalent nominal mode shift would be larger than this measure, because a shift from SOV to carpooling still requires some parking spaces to be used. Some of these 41 cases are comparable to the \$4 charge + \$2 cashout scheme: cases 10, 11, 18 and 38 (both are the CH2M Hill Bellevue example), 33, and 35 (the Twentieth Century example). The average number of parking spaces freed per 1,000 workers is 219. Summaries of these cases are provided in Table 9 at the end of this paper. [11. BWC]

For calculations in this paper, a nominal mode shift of 23% is assumed. The 219 spaces out of 1,000 workers would translate into a higher mode shift. The two most applicable cases, CH2M Hill and Twentieth Century, have higher shifts. For suburban tech worker commute, it is expected that more of the mode shift will occur via carpooling rather than via transit. With new GPS cellphone technology (Apple iPhone & Google Android T-Mobile phones), "instant ridesharing" is enabled, where one-time rides are arranged within minutes of the start of the trip. With instant ridesharing, a person may carpool every day, but with the flexibility of a different departure time and group of people each day. Instant ridesharing can handle schedule variations in a manner that makes transportation routine and hassle-free. Evolving solutions come from Avego, ZimRide, Goose Networks, Carticipate, Piggyback, NuRide, and Google RideFinder.

From the field of behavioral economics, there is evidence that potential losses are more motivating than potential gains. In *The Paradox of Choice*, Barry Schwartz has a discussion of this "loss aversion" phenomenon. Schwartz cites research by Kahneman and Tversky demonstrating that, "Losing \$100 produces a feeling of negativity that is more intense than the feelings of elation produced by a gain of \$100." [5. Tversky]

In the book *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing*, the author provides a discussion of positive (gain) and negative (loss) framing: Behavior change "messages which emphasize losses which occur as a result of inaction are consistently more persuasive than messages that emphasize savings as a result of taking action." [6. Message]

Janis Hom, consumer product marketing expert states, "The idea of rewards motivating behavior change is really only a wishful theory. When a sufficient pain threshold is reached, then people change. The frog being brought to a slow boil is an apt analogy. At a moderate heat/pain level, you can slow-cook a frog. If you turn the heat up high, the frog jumps out of the pot (a behavior change). \$4/day is not a sufficient reward to significantly change worker commute patterns – especially high-paid workers."

Our \$4/day cashout combined with \$2/day charges has not only a \$2/day irritant that will continue to gnaw at SOV commuters over time, but the dollar benefit for green commuting versus SOV commuting is \$6 per day (\$1,380 per year), a significant level of financial motivation that SOV commuters will think about (rather than ignoring) during this gnawing process. The 1990 Ch2M Hill example given above achieved nominal 25% mode shift via this combined carrot/stick approach, with a daily parking charge rate that was close to \$2 per work day.

VTPI Reports Support the Predicted 23% VMT reduction

VTPI's 2009 *Transportation Elasticities* report lists three reports suggesting a greater than 23% reduction can be expected, while one report suggests a less than 23% reduction can be expected:

- Parking fees are found to have a greater effect on vehicle trips, typically by a factor of 1.5 to 2.0 (USEPA, 1998). For example a \$1 per trip parking charge is likely to cause the same reduction in vehicle travel as a fuel price increase of \$1.50 to \$2.00. [14. VTPI, pg 18]
- \$4 parking charge for suburbs yield a 36.1% reduction. [14. VTPI, pg 19, Table 15]
- Shoup found that charging reduces SOV by 20-40%. [14. VTPI, pg 21]
- Hess (2001) found \$6 daily parking charge reduced SOV from 62% to 46%, only a 16% nominal reduction. [14. VTPI, pg 19]

VTPI's *Trip Reduction Tables* provides lookup tables for combinations of commuter financial incentives and parking charges, yielding a "percent reduction in commute trips." Using interpolation and adjusting Tables 4 and 5 for inflation between 2000 and 2009 via the US Consumer Price Index yields a relative 25% SOV commute mode share reduction for the most auto-centered locations (low density suburbs with poor transit options). For all of California, there is a mix of auto-centeredness, so the SOV reduction will be greater than 25%. Further, the financial incentive is a "rideshare/transit subsidy" that would not be quite as effective as a broader cashout that incents telecommuting and biking alternatives, hence the SOV reduction will be increased. A commuter's sensitivity to driving pricing is influenced by a number of factors, including income level. Assuming that California has higher income than the US average, the SOV reduction will be lowered from those shown by an income effect. Calculations are provided below in Table 4: [15. VTPI/Comsis, pg 2]

VTPI's *Trip Reduction Tables*

		daily charge	daily charge
	incentive	\$1.30	\$2.60
Table 4	\$2.60	20.80%	28.40%
Table 5	\$4.00	28.30%	34.80%

Adjusted from 2000 \$ to 2009 \$ via CPI

		daily charge	daily charge	daily charge
	incentive	\$1.62	\$2.00	\$3.24
Table 4	\$3.24	20.80%		28.40%
	\$4.00	24.08%	25.01%	32.00%
Table 5	\$4.98	28.30%		34.80%

Table 4: VTPI's *Trip Reduction Tables* yield a "percent reduction in commute trips"

Moving Cooler Report Supports the Predicted 23% VMT reduction

There are three items of interest in the Moving Cooler Report.

First, Moving Cooler provides a 0.4 price elasticity of VMT demand. [16. Moving Cooler Appendices, pg B-15]. The full U.S. cost of driving per mile is \$0.55 as reflected in the 2009 US Business Mileage Reimbursement Rate [17. Reimbursement Rate] The \$2 charge + \$4 cashout is perceived as a \$6 daily change to commute costs. Assuming an average daily US roundtrip commute of 26 miles, each round-trip commute takes one gallon of gas at 26 mpg CAFÉ. Hence, for commuting, the policy increases the cost of driving by \$6 per commute divided by 26 miles for a total of \$0.23 per mile. For a price elasticity table lookup, we have a 50% price change in the cost of driving with an elasticity of 0.4. The table lookup is provided by VTPI [18. Elasticity Spreadsheet] and results in a predicted 23.3% VMT reduction.

It can be argued that using "full driving cost" price elasticity understates VMT reduction. Many believe that drivers assume many driving costs, such as car purchase/depreciation, are fixed, and these drivers change behavior based on perceived variable costs.

Second, looking to the explanation of "Employer Based Commute Strategies" in the Technical Appendices, Moving Cooler provides an alternative way to calculate the commute VMT reduction of the \$2 workplace parking charge + \$4 cashout policy. The calculation below in Table 5 is created by summing the impact of one high intensity TDM program, four one-dollar parking cashouts, and two one-dollar parking charges: [16. Moving Cooler Appendices, pg B-54]

Strategy	Description	% chg commute VMT		
		LL - large metro	Qty	total
TDM Program	High intensity	5.20%	1	5.20%
Parking Cashout	\$1/day	3.70%	4	14.80%
Parking Charges	\$1/day	0.90%	2	1.80%
				21.80%

Table 5: Calcs based on Table 5.13, Commuter Measure Impacts

Commuter Measure Impact calculation assumptions and qualifications:

- California metropolitan areas average to “LL” large metropolitan areas (Over 1M population with lower per capita baseline transit use). For the proposed policy, the Moving Cooler authors might prefer some sort of a weighted average calculation using LH, LL, etc in Table 5.13. Further clarification by Moving Cooler authors would be helpful. The \$2 charge +\$4 cashout policy’s primary focus is on suburban office workers in large metro areas living in medium to low density housing with low transit use.
- If “MH” medium-sized metro is substituted for “LL,” the resultant VMT reduction is 27%
- For “TDM Program,” the Moving Cooler authors envision employer TDM programs offering transit, ridesharing, and other TDM programs. The \$2 charge + \$4 cashout policy would create a high-intensity TDM program via different means. The policy would scale TDM up to a statewide level, necessarily creating a more systematic approach to TDM, with private sector technology-laden TDM services growing faster than more traditional TDM offerings. The \$2 + \$4 policy envisions TDM spreading more thoroughly to small employers than Moving Cooler.
- Cashout/charge VMT impact is assumed to be a linear function of price/incentive.
- Moving Cooler shows a higher per-dollar impact of cashout versus charges. This is not borne out from behavioral economics theory or TDM case studies. On pg B-57, the authors state that their numbers might be improved by further validation and review.

Third, it is tantalizing to contemplate Moving Cooler’s Policy 6.2.7, a \$5/day employer parking tax that must be passed on to commuters and must be “made visible” to commuters each day. Moving Cooler cautions this would be politically difficult. Moving Cooler did not provide a distinct calculation of the (large) VMT reduction this policy would induce. [16. Moving Cooler Appendices, pg B-56]

Data on “VMT as a Function of Fuel Price” Supports the Predicted 23% VMT Reduction

A price difference for green commutes versus SOV commutes of \$6 has the equivalent financial motivation of \$6 gallon gas tax increase. [7. Gas Calc] Per capita driving is influenced by many other factors besides gas price (such as auto-centered land use, scarcity of quality transit options, high per capita residential square footage, etc), but a comparison of developed countries with higher gas prices than the U.S. (Japan, France, Germany, and the UK) shows an interesting correlation. The non-U.S. gas prices analyzed are historically 190% to 270% of U.S. prices. As would be expected, low U.S. gas prices are correlated with high per capita vehicle miles traveled (VMT). This is a further argument that suggests that the charges + cashout scheme will result in a large commuting behavior change.

Once the cost of driving is permanently increased, then driving behavior changes. By a “permanent price increase,” we mean that a majority of drivers believe higher prices are “here to stay” as opposed to representing only a temporary price fluctuation.

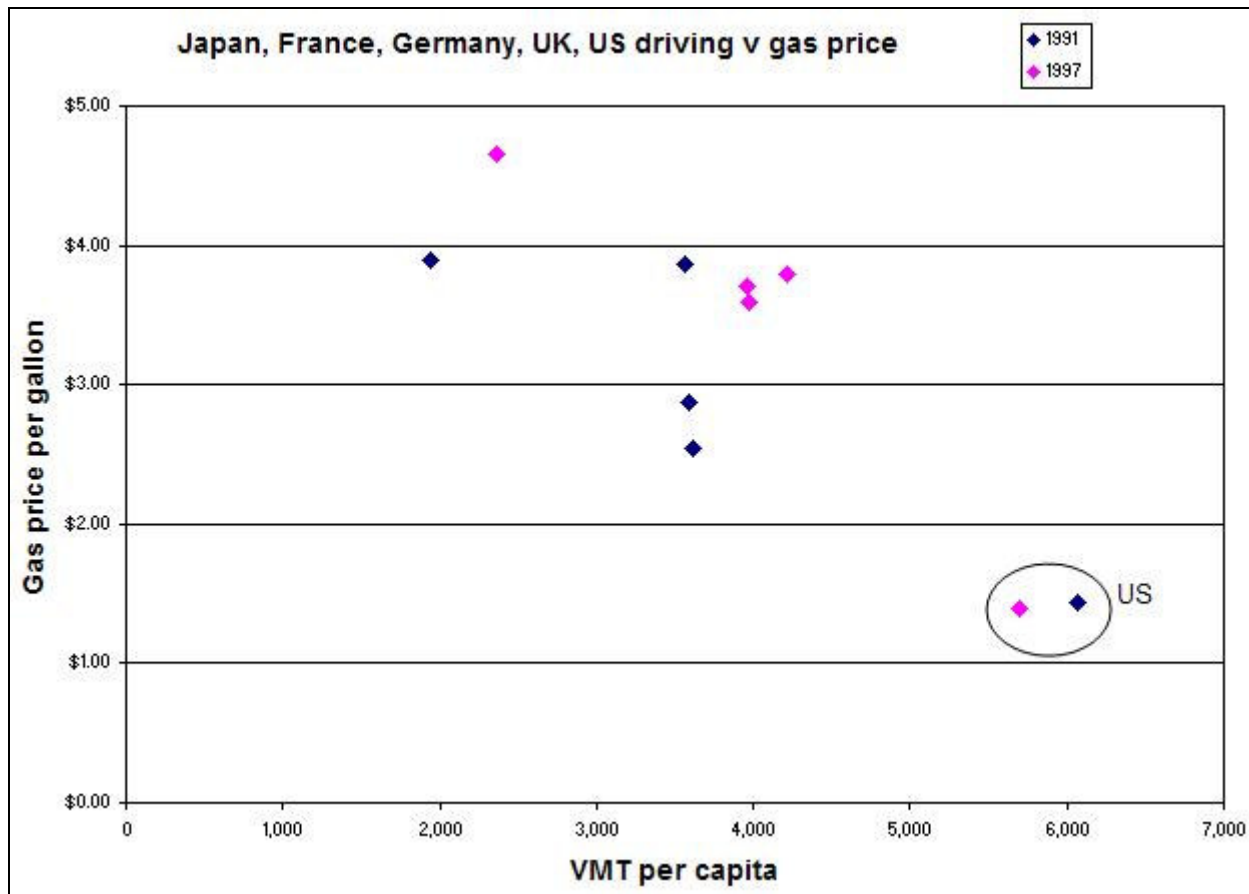


Figure 1: Gas prices are "at the pump" gas prices, including taxes [12. Gas Price]

The Moving Cooler Report states that moving to European level gas taxes, "starting at \$2.40 a gallon in 2015 and increasing to \$5.00 a gallon in 2050 could result in a 28% reduction in GHG emissions." Interestingly, Moving Cooler also finds that a much smaller \$1.25 increase produces a 17% GHG reduction. [13. Moving Cooler, pg 80]

5. META STRATEGY: "LESS WORSE"

California State Senate staffer: "It seems unlikely that prominent pricing policies like cap and trade or a big gas tax will be implemented in California, therefore, a lower-cost, 'dark horse' policy like '\$2+\$4' could rise up. 'Least-worst' policies may win."

A State of California TDM staffer commented, "If the government could mandate a parking tax or charging for parking, we could reduce commute VMT to a level that would be in line with climate protection goals. But, a 10-year-old survey of pricing measures found that parking charges rated the lowest. Hence, high parking charges do not appear to be politically feasible. Folks think free [suburban] parking is their god-given right."

A company that voluntarily pioneers charges + cashout risks productivity-reducing internal employee strife between climate protectors and climate skeptics. Companies objected to the idea of workplace parking charges with responses such as:

- "I don't foresee our company ever imposing a parking fee directed towards our employees. We prefer to offer incentives to use alternative transportation (such as our commuter shuttle service) verses implementing a system that penalizes employees. For example, recruitment and employee retention are vital to our success. Telling our employees that they have to pay for parking would not fly."
- "Charging is not in keeping with our culture. We have lots of incentives in place."

Voters and companies could conceivably be moved to support state-mandated charges + cashout as a more palatable alternative. A state mandate would displace the blame for the charge away from the employer. The full text of a State of California Legislative Proposal following the meta-strategy is provided in Appendix A below.

Charges + cashout is a complicated pricing scheme. Conceptually simpler pricing proposals (such as carbon tax, congestion pricing, \$6/gallon gas tax increase, and substantial parking charges) bring much more economic harm to constituents. A staffer for a California state senator advised that more draconian pricing policies could advance first, raising the ire of commuters and business interests. With the threat of unpopular policies made, then charges + cashout can advance politically as the “less worse” alternative. The staffer envisioned a slow process to bring this about. The 2008 political failures of both San Francisco’s Doyle Drive congestion charge and New York City’s \$8 86th Avenue congestion charge are illustrative of the political challenge faced by more economically punitive policies.

Charges + cashout helps to reduce the perceived real-estate advantage of free-parking suburbs over metropolitan downtowns, hence metropolitan in-fill political champions could be called upon to lobby on behalf of the policy.

Companies also objected to the cost of time in explaining an unpopular policy to employees as well as the potential productivity-reducing internal employee strife between climate protectors and climate skeptics:

- “An employer’s organizational cost for communicating complex, new initiatives such as parking charges is huge. Employees can only absorb so much corporate information. Cashout is a complicated-to-explain concept. Parking charges are a complicated-to-explain concept. Combining both is complicated further still. The time spent internally communicating this program (and dealing with objections and questions) will cause delays to other important corporate messages. There is an opportunity cost associated with a company engaging on this issue. Your program will suck up a lot of valuable time by exec staff and HR, don’t think that it is simple to implement such a program. You should not underestimate the corporate cost of this program. There may also be fear of an uncontrollable change in corporate culture.” The state’s role is to make this scenario the least worst alternative, and to cause a “media swarm” to explain the policy to all state residents, reducing the need for corporate communication and eliminating the motivation for internal debate.
- “You’re telling 75% of our employees (the SOV commuters) that they are bad.” Without a state mandate, employers are forced to introduce a divisive political issue into a workplace where all workers should cooperate to maximize company share price. Even if 95% of workers were climate protectors in favor of the scheme and only 5% were climate skeptics, strife between the two sides would lessen company productivity. The state’s role is to allow companies to be the savior, claiming lobbying success to avoid a draconian \$6 per gallon gas tax increase. Furthermore, the initial \$0.25 charge was selected to be small to reduce irritation compared to the \$2 charge.
- One climate-skeptic employee revealed a passionate opinion revealing the potential for internal strife, “If my company made me listen to that sort of propaganda, I would look for another job. The personal car IS the right to be mobile. To oppose its use is to oppose our freedom.”

6. COLLECTIVE ACTION AND THE TRAGEDY OF THE COMMONS

There is free parking at every U.S. workplace surface parking space, where the following three conditions exist:

- the office has no parking structure
- the office is not in a central business district
- the office is in an office zone rather than a university zone.

By reducing commute VMT/CO2 by 23%, charges + cashout will benefit everyone, and by reducing the demand for parking spaces at worksites, employers reduce expenses and gain a potentially lucrative opportunity to re-develop the land. So why are free-parking workplaces never converted to charged? Because of the Tragedy of the Commons, the inability to act in the larger collective interest because of individual/local counter-incentives. There is a first-mover disadvantage preventing implementation. [8. Tragedy]

If one city with 5,000 office surface parking spaces starts charging for parking, then that city becomes uncompetitive with the rest of the local office market (not to mention the national market). Thus, cities/employers need to "jump in together" to overcome the Tragedy of the Commons. (The implementation will have multiple major U.S. office sub-markets jump in by charging a small amount, on the assumption that 75% or more of the office market will still have free parking. The policy will then spread with a time lag to new markets, and the parking charges will increase over time.)

Here is an example of collective action by cities to impose smoking bans: (anonymous source)

"Interesting example in the Twin Cities. It was always "impossible" to change bars and restaurants to non-smoking. Every time any city council member proposed it, they were shouted down by people who said, "But people will go somewhere else and all our businesses will lose out." Then one December day the city of Bloomington (largest suburb) passed a smoking ban. The following month St. Paul did the same, then Minneapolis right after. It turns out the cities had been in agreement all along about who would go first and who would follow next."

7. "TROJAN HORSE" DIFFUSION STRATEGY

A flavor for a nationwide charges + cashout spread can be illustrated by example. A leading state or states could phase in a parking tax, with raises every six months. The state would allow companies to substitute charges + cashout in place of the parking tax, allowing similar phasing. The state would require large companies to adopt the policy first, then lower the company size threshold every six months. The state's example would lead other states to follow in implementation. Eventually, a U.S. example would lead to other auto-centered countries adopting the same. By "Trojan Horse," the notion of converting from \$0.00 per day parking charges to almost any small charge breaks through the free parking barrier, allowing increased charges in the future. The challenge is not in moving from \$1.75 to \$2.00, but in moving away from \$0.00.

Large companies might be forced to jump in during January 2009, implementing \$1/day cashout and \$0.25/day charge. Six months later, during July 2009, the large companies would advance to \$2 cashout and \$0.50 charge. Also in July 2009, the next tier of slightly smaller companies would jump in at \$1 cashout + \$0.25 charge. The policy would spread by a charge gradient. Eventually, all companies beyond a minimum size would advance to \$4 cashout + \$2 charge. By "stairstepping" companies based on size, there is only a slight first-mover disadvantage, only a \$0.25 per day HR recruiting disadvantage for largest companies versus next-largest companies.

8. GRANDIOSITY

A "grandiose" scheme is ambitious and elaborate, and possibly foolhardy. Reducing U.S. CO₂ by 51.7M tons per year via collective action and individual behavior change is grandiose. A reading of ULI's Growing Cooler report suggests that multiple grandiose schemes should be attempted simultaneously in order to meet 2020 and 2050 climate objectives. Private sector companies regularly strive to achieve grandiose objectives such as 90% market share in large markets.

9. TRUST BASED MONTHLY REPORTING

To implement parking charges, it is often necessary to have "access control" at parking lots to track the comings and goings of parkers for charging purposes. Access control may be implemented via "a man in a booth controlling an access gate" or via more automated means. In the past, access gates have been found to be cost-prohibitive because entryway paving and landscaping has to undergo major modifications.

One Bay Area company has pioneered low-cost, trust-based employee cashout monthly reporting. About once a week, employees fill out a web-based form to record their commuting and to collect their cashout benefits. With self-reporting by employees, there is risk that employees could "cheat" and collect more benefit than they deserve. The company's periodic mode choice / parking count studies have found that employees under-collect their \$4 per day cashout benefit by about 20%. Hence, for this company, self-reporting appears to work successfully.

For implementation of cashout + charges, a company would probably decide that monthly web reporting should not allow double commuting benefits. For days when a worker commutes via modes where the company provides some subsidy or funding, the \$4 per day cashout would not be provided.

A hypothetical self-reporting web screen example is provided below for "Company Y" in San Jose. Company Y participates in the Commuter Check program, where employees buy transit passes with pre-tax dollars and Company Y subsidizes transit pass purchases. Company Y has decided that Commuter Check is a sufficiently large benefit that the \$4 per day cashout will not also be provided on days when employees commute using Commuter Check. Likewise, Company Y provides an express commute bus from San Francisco to San Jose for employees, with a company funded cost of \$20 per commute per day. The express bus and \$4 cashout are also mutually exclusive. In this example, there are 22 work days in May. The employee submits the report and Company Y pays this employee \$36 (\$40 worth of parking cashout less \$4 worth of parking charges). If an employee parks a car at the office a majority of days, then that employee will owe Company X for parking charges.

May 2008, 22 working days

	Days	\$/day	\$	comment
Vacation / sick days	1	0	\$0	
Commuter Check days	7	0	\$0	Using pre-tax Caltrain or VTA passes
SF->SJ express bus	2	0	\$0	
Other green commutes	10	\$4	\$40	rideshare, telework, bike, walk
Parked car at office	2	(\$2)	(\$4)	Did not share a ride
total	22		\$36	

Table 6: Web-based Self-reporting Screen

Unsystematic survey research found that the majority assumed that others would cheat frequently. One company commented, "Self-reporting won't work. Without enforcement, there will be too much cheating. You have to have some teeth. The current web-based self-reporting that one Bay Area company has implemented is ONLY for a cashout. When you move to charges, then self-reporting won't work. Some workers will rebel against the charge and they will influence others to further rebel."

If cheating is prevalent, then web-based reporting will fail. There are ways to detect cheating. Transportation firms can count people as they come onto company property in the morning, logging their commute method (they have to count people rapidly when carpools come in). The firms can accurately estimate actual company-wide commuting behavior, allowing comparison against self-reporting.

The initial \$0.25 charge + \$1 reward was designed to ease in the self-reporting scheme with a very small monthly charge for solo drivers. This should reduce the motivation for cheating. If cheating is a huge problem, then executive staff can raise the issue with the entire company. Remedies include implementing automated (non-gated) parking systems or canceling the program. The field of inexpensive, technology-intensive, automated parking systems is expanding rapidly, and may provide a reasonably priced solution. The threat of canceling the \$2/day charge + cashout program, to be replaced with a \$6/day parking tax should motivate individual compliance.

10. MONETIZATION OF SAVED PARKING SPACES & EMPLOYER FINANCIAL IMPACT

Discussions with employers have made it clear that there is no one, single benefit that a major employer's real-estate department is looking to obtain from a city in exchange for reducing VMT and parking demand. Real-estate situations experienced by different employers vary greatly, influenced partly by the current financial performance of each company. Some companies wish to expand, some wish to contract, some have severe parking shortages, some have large parking surpluses, some own their land and buildings, some lease their land and buildings.

Some employers have such severe parking shortages that a 23% reduction in parking demand would provide a huge benefit. For these companies, the value of the daily subsidy for parking a car at the office is

much greater than \$7.59. These employers may be less motivated to negotiate additional benefits from cities.

Some employers would be very happy to reduce parking demand and in-fill directly on the recovered land. Others would be happy for new, tradable development entitlements to be created that they could sell to others. Some employers would find expedited processing by the City's Planning Department to be of value. Some companies would want to negotiate for reduced traffic impact fees for their next expansion. Some companies would ask for tradable rights to reduce impact fees that they could then sell to third parties.

One can even envision a "parked car cap and trade system." For a 35,000-job office park, the number of cars could be capped at current levels. When an employer with 3,000 employees within the office park implemented cashout + charges, new development credits would be granted to that employer to add new development to bring the car count back up to the cap. The credits could be traded (sold for profit) within the office park to landowners interested in in-filling. The parked car cap would effectively cap real-estate development, only allowing new development when virtuous employers reduced cars. [9. CRIB]

At \$4 cashout and \$2 charge, parking revenue does not completely cover cashout cost. Unless other benefits are created, a company "loses money" for being virtuous. This level of loss is less than the loss from a state \$6/day parking tax. A example below in Table 7 calculates cashout cost and parking revenue. For this example, an additional benefit of \$1.35 per green commuter per work day would break even.

The example below is for a typical employer with 80% SOV commute mode share in 2008 and 1,000 employees. Cashout cost and parking revenue under the \$4/\$2 scheme is calculated for 2012 below. To put this in perspective, in 2008, the employer's annual subsidy to accommodate parked cars is \$1.4M - much, much larger than cashout cost. In 2012 when a 23% commute mode shift is achieved, the potential "car parked subsidy" savings on the 23% of cars that disappear would be \$419,000 (at \$7.59 per car parked per day), far in excess of the cashout cost.

CASHOUT COST	
employees	1,000
2008: 20% non-parking	200
2012: 43% non-parking	430
work days/yr	240
2012: daily reward/green	\$4
2012: cost/yr	(\$412,800)
PARKING REVENUE	
2012: 57% park	570
2012: daily charge	\$2
2012: rev/yr	\$273,600
ADDITIONAL BENEFITS	
HR recruiting advantage	
CEO ego benefit	
Parking shortage fixed	
Real-estate reward from City	
Real-estate in-fill benefit	possibly huge

Table 7

For \$4 cashout and \$2 charge, assuming 23% nominal mode shift away from SOV, the "breakeven" for a company (ignoring many additional corporate benefits) is about \$4 cashout + \$3 charge. If only a 15% nominal mode shift away from SOV was achievable, then the corporate breakeven scheme would be \$4 cashout + \$2.15 charge (when there is less money to pay out as cashout, then the parking charge may be reduced). It is worthwhile to mention that an implementation could adjust the ultimate cashout level and charge level, based on the interim mode shift measurements.

Financial calculations for monetization of parking reduction:

Impact of \$2 parking charge + \$4 cashout		
	CA	
2007 population	37,000,000	
50% of residents work, 50% in offices	9,250,000	
\$2 parking charge + \$4 cashout mode shift induced	23%	
# office workers shift mode	2,127,500	
CO2 tons/yr saved (3 per commute shifted)	6,382,500	
Monetization of parking reduction		
square feet of tradable devt rights granted per commute reduced	250	One parking space is 350 sf
total new sf devt rights granted for all the freed parking spaces	531,875,000	
Profit to landowner per sf for devt w/ land already purchased	\$400	Build for \$200/sf, sell for \$600/sf
New real-estate profit created	\$212,750,000,000	

Table 7.1

11. SURVEY RESEARCH [10. Working Paper]Survey framing & belief change

A web-based employee survey was developed to understand qualitative issues associated with the scheme. The survey presented the scheme as a policy debate, with pros and cons, asking respondents for short essay responses. The 55 responses: a) identified special cases in need of clarification and b) provided colorful and useful comments from the extreme ends of the response spectrum.

With the Tragedy of the Commons, the self-interested majority favors a climate-harming policy because of perverse individual incentives. "If only I change, I'm worse off; if we all change, we're all better off ... hence, I won't change." A self-interested U.S. voting majority prefers free suburban workplace parking to subsidize solo commuting over green commute alternatives. The persuasive, educational survey provided a "fair" set of pro/con policy arguments (where "fair" follows political science "framing" theory). [20. Framing] [21. Framing] The pro-climate arguments are based on a richer set of facts, but the main argument is an explanation of the Tragedy, followed by an appeal for long-term over short-term optimization. The survey was sufficiently persuasive to "change belief" to bring about a pro-climate voting majority.

The persuasive survey can bring about Druckman's "belief content" change. IE persuasion occurs, it's not just a battle over which of two different frames are more important in the voters' mind.

Citizens aren't educated about transportation and land use as part of civic learning. Both fields are complicated topics where urban legends inform voting. Everyone experiences land use and everyone drives, so therefore voters think they are experts. For complex Tragedy of the Commons issues, Walter Lippmann's 1922 critique (oversimplified and ill-informed citizens) is accurate.

Three parking facts within the parking survey are "new" to respondents and are persuasive:

- Driving has to be reduced to meet Climate objectives.
- Commute/parking behavior is radically different in SF versus Silicon Valley, because of parking pricing
- Free suburban office parking represents a perverse \$7.59 per day subsidy for harmful single occupant vehicle commuting.

A panel of credible professional methodologists could take the survey instrument, modify it a bit, and bless the resultant instrument as "fair." Such a process could provide a moderate to high level of Druckman's "source credibility."

Survey instrument example

The complicated survey instrument was successful in taking respondents through a complicated policy debate in 10 minutes. 48 out of 55 respondents completed the main five questions. A typical, complicated pro/con debate, multiple choice question, and free-text essay field follows: [19. Survey]

Assume the following hypothetical scenario: Starting January 2009, your company will charge \$0.25 per day for parking, for each worker who drives alone to work. Your company will also reward each worker who uses commute alternatives with \$1.00 per day. Once per week, you will take one minute to report your commuting in a web form. You will be charged/rewarded based on your report.

Pro: This will reduce traffic and induce greener commuting. Charging for parking has been shown to be effective in changing commuting behavior.

Con: Paying for parking is inconvenient. Employees are entitled to free parking.

DETAILS

Pro:

* For about 75% of Bay Area workers, commuting by driving alone is the preferred mode compared to commute alternatives {transit, carpooling, telecommuting, biking, and walking}. In some downtowns, parking is an expensive hassle. In San Francisco, 43% of workers commute by driving alone. The majority of this commuting difference is explained by parking charge/hassle, although good transit options also play a role.

* Bay Area parking spaces take up valuable land. Employers have to pay for parking space land used by drive alone workers. Employers can save money when workers commute via alternatives that require less land for cars. Because of land costs, Bay Area employers provide a hidden \$7.59 daily subsidy to free-parking, drive alone commuters.

* All workers are not entitled to free parking. Many companies have pay-for-parking downtown offices, for example: {Google, 76 Ninth Ave., New York; San Francisco: eBay 199 Fremont; Yahoo 475 Sansome; Adobe 601 Townsend.}

* Rewards-only policies for commute alternatives are ineffective in changing commute behavior. Studies show that charges (irritants) are effective whereas small rewards are ignored.

Con:

* "There is free parking at almost every non-downtown parking space at U.S. offices. There is no justification for breaking away from free parking. Our company has no obligation to change this."

* "I don't foresee our company ever charging employees for parking. We provide incentives to use commute alternatives (such as our commuter bus service) versus penalizing employees. Recruitment and employee retention are vital to our success. Telling our employees that they have to pay for parking would not fly. We previously asked employees about parking charges and received strong negative responses."

* "\$0.25 per day parking charges are a joke. The policy won't make a difference."

END DETAILS

2. In light of the pros and cons given above, are you in favor of the \$0.25 per day parking charges + \$1.00 rewards scheme? (0 = strongly opposed, 5 = neutral, 10 = strongly support)

Your comments/advice related to this page <free text entry>

Survey results

The web survey was posted on seven list servs, shown in Table 8 below. Four list servs are majority climate protectors, one list serv is majority climate skeptics:

	members	responses
Sierra Club Bay Area Transit list serv		2
Climate Concern yahoo group	2365	2
Transport Policy yahoo group	335	4
CUTR's Transp-TDM - commute reduction	1263	21

Fostering Sustainable Behavior		20
CUTR's Parking	146	0
SF Bay Peak Oil yahoo group	211	6

Appendix Table 8

Respondents identified a number of special cases to be addressed:

- Address spillover parking (for large office parks with adjacent residential, implement residential parking permits with high enough permit prices to cover implementation costs).
- Develop exceptions for swing and graveyard shift workers.
- Companies whose employees are covered by bargaining unit contracts could be charged with unilaterally making a change in 'working conditions'. Hence, this scheme would have to be negotiated with the bargaining unit, not imposed unilaterally.

Respondents helped add questions to the scheme's Frequently Asked Questions document. This FAQ should be useful for implementation.

12. CONCLUSIONS FROM THE TRANSPORTATION RESEARCH BOARD 2009 CONFERENCE

At TRB 2009, it became clear that climate-leader New York City had missed an opportunity. In NYC's taking of a virtuous stance to protect the climate (proposing cordon pricing south of 86th Street), NYC missed an opportunity to demand that job-rich, high-per-capita-VMT suburbs take tiny steps to reduce commuting. NYC should have conditioned their actions on small employee parking charges for White Plains, Purchase, and Parsippany workers. NYC could have moved the Trojan Horse of parking charges into suburban job sites, where those charges could have later increased. Carbon from suburban commuting is far larger than big city commute carbon. NYC would serve the climate better by focusing on its suburbs, not on competing with London, San Francisco, and Seattle.

13. ACKNOWLEDGEMENTS

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- Research Funding Provided by U.S. Environmental Protection Agency Collaborative Network for Sustainability grant program, Transforming Office Parks into Transit Villages study. Diana Bauer, Program Manager.

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16. [Moving Cooler Appendices] *Technical Appendices: Moving Cooler*, by Cambridge Systematics, October 2009. Published by Urban Land Institute. http://www.movingcooler.info/Library/Documents/Moving%20Cooler_Appendices_Complete_102209.pdf
17. [Reimbursement Rate] 2009 US Business Mileage Reimbursement Rate, http://en.wikipedia.org/wiki/Business_Mileage_Reimbursement_Rate
18. [Elasticity Spreadsheet] *Elasticity Spreadsheet*, Todd Litman, Victoria Transport Policy Institute, 5 June 2009. www.vtpi.org/elasticity.xls. "This spreadsheet calculates the changes in consumption predicted to result from price changes, based on various elasticity values."
19. [Survey] A very quick way to understand the policy's pros and cons is to take the following seven-question educational survey. Imagine you are a suburban knowledge worker commuter with a one-way commute distance of 13 miles and "medium-quality" transit alternatives: <http://www.surveymonkey.com/s/QTS7GCF>
20. [Framing] Willem E. Saris, and Paul M Sniderman (eds.), 2004, *Studies in Public Opinion: Attitudes, Nonattitudes, Measurement Error, and Change*, Princeton, N.J.: Princeton University Press. Chapter 5, *The Structure of Political Argument and the Logic of Issue Framing*.
21. [Framing] *On the Limits of Framing Effects: Who Can Frame?* James Druckman, University of Minnesota. *The Journal of Politics* (November 2001 Vol 63 #4), 63:1041-1066 Cambridge University Press

Appendix Table 9: Best Workplaces for Commuters: TDM Case Studies

<p>Case #: 10 Author: Tabitha Graves Title: Transportation Demand Management (TDM) Programs: Profiles of Selected Universities Publication: University of Wisconsin-Madison Environmental Management Campus Ecology Research Project No.5 Date: December 1993 Web site: http://www.fpm.wisc.edu/campusecology/cecp/tdm/tdm.htm Excerpt: See table: The percentage of drive-alone employees arriving on the UCLA campus between 6 and 9 a.m. fell from 73.7 percent in 1984 to 57.7 percent in 1992. This was a result of a variety of TDM measures, including parking pricing, carpool and vanpool programs, local bus service, late night van service, and emergency ride home Policies: Worksite TDM (general) pkng spcs freed per 1,000: 160 Location: University of California at Los Angeles</p>
<p>Case #: 11 Author: Comsis Corporation Title: Implementing Effective Travel Demand Management Measures Publication: Federal Highway Administration and Federal Transit Administration Date: September 1993 Excerpt: "[Pasadena's] TDM program includes a drive-alone disincentive, parking fees, but also many incentives to employees to carpool. Elements of the program that influence carpooling include: reduced parking cost..., transportation allowance..., guaranteed ride home..., on-site ridematching.... Between 1989 and 1990, SOV percentage decreased 30 percent, from 83 percent SOV to 58 percent SOV at City Hall." Policies: Worksite TDM (site-specific) pkng spcs freed per 1,000: 250 Location: Pasadena, California</p>
<p>Case #: 18 Report No. FHWA-SA-90-005 Pub Title: Evaluation of Travel Demand Management: Measures to Relieve Congestion (Case Study 6: CH2M Hill, Bellevue, Washington) Pub Date: February 1990 Author: US DOT, Federal Highway Administration Summary: CH2M Hill is an architectural/engineering firm of approximately 400 employees that has used a "transportation allowance" program in conjunction with restricted on-site parking. The company has achieved a mode share of 54% drive alone, 17% transit, 12% carpool, 17% other (59.4 vehicle trips per 100 employees). These figures were compared to regional control sites' mode share of 81.8% drive alone, 3.3% transit, 11.0% carpool, 0.8% vanpool, and 3.1% other (86.4 vehicle trips per 100 employees). Policies: Worksite TDM (site-specific) pkng spcs freed per 1,000: 278 Location: Bellevue, Washington</p>
<p>Case #: 33 Author: Daniel Baldwin Hess Title: The Effects of Free Parking on Commuter Mode Choice: Evidence from Travel Diary Data Publication: Ralph & Goldy Lewis Center for Regional Policy Studies at UCLA Working Paper Series #34 Date: April 2001 Web site: http://www.spsr.ucla.edu/lewis Excerpt: "[A multinomial logit model] predicts that with free parking, 62 percent of commuters [in Portland's CBD] will drive alone, 16 percent will commute in carpools and 22 percent will ride transit; with a daily parking charge of \$6, 46 percent will drive alone, 4 percent will ride in carpools and 50 percent will ride transit." Policies: Parking Pricing pkng spcs freed per 1,000: 160 Location: Portland, Oregon Notes: This is a modeling study based on empirical data from the Oregon and Southwestern Washington 1994 Activity and Travel Behavior Survey conducted by Cambridge Systematics.</p>

<p>Case #: 35 Author: Richard Willson, Donald Shoup, and Martin Wachs Title: Parking Subsidies and Commuter Mode Choice: Assessing the Evidence Publicaton: University of California at Los Angeles Date: July 1989 Excerpt: K.T. Analytics (FTA Parking Cash Out Web page): "A program of transit and vanpool subsidies as well as preferential parking for carpoolers had little effect until [Twentieth Century Corporation in Los Angeles] raised the price of employee parking from no charge to \$30 per month for solo drivers. Solo driving decreased from 90 to 65 percent after pricing, a 49 percent decline." Policies: Parking Pricing pkng spcs freed per 1,000: 250 Location: Los Angeles, California Notes: Decline of 49% cited in text appears to be incorrect.</p>
<p>Case #: 36 Author: Monica Surber, Donald Shoup, and Martin Wachs Title: The Effects of Ending Employer-Paid Parking for Solo Drivers Publicaton: University of California at Los Angeles Date: 1984 Excerpt: "Ending free parking for solo drivers at [the Southern California transportation services firm] Commuter Computer dramatically reduced solo driving. Solo driving decreased from 42 percent of the modal split during the last 4 months of free parking to 8 percent during the first 3 months after the parking subsidy for solo drivers was ended." Policies: Parking Pricing pkng spcs freed per 1,000: 340 Location: Los Angeles, California Notes: The parking subsidy at Commuter Computer was removed only for employees who did not need their car for work.</p>
<p>Case #: 38 Title: Proceedings--Commuter Parking Symposium Publicaton: Metro and Association for Commuter Transportation, Seattle, Washington Date: December 1990 Excerpt: K.T. Analytics (FTA Parking Cash Out Web page): "CH2M Hill in Bellevue, Washington] began charging solo drivers \$40 per month for parking, the amount the company pays the building owner for parking. All employees receive a \$40 per month travel allowance in their paychecks. Carpoolers park for free. Walkers, cyclists and drop offs keep the travel allowance. Solo driving declined from 89 percent to 64 percent after the parking policies were put into place, a 28 percent decline." Policies: Parking Pricing pkng spcs freed per 1,000: 250 Location: Bellevue, Washington</p>

Table 6

APPENDIX B: IMPLEMENTATION NOTES

It's crucial to signal that the 23% reduction in commuting is PERMANENT. With permanence comes real-estate developer willingness to undertake in-fill projects in parking lots. If a developer believes that the reduction is only temporary and that parking demand will surge in the future, then those parking spaces won't be redeveloped. Permanence is also important for regions and cities to reduce building code parking space requirements. With smart growth laws such as California's SB375, we're seeing some public policy moves to tighten parking as part of climate protection strategy. Within San Francisco, there has been a permanent signaling that fewer parking spaces are required per square foot of leasable office space, and developer plans and city building codes reflect this. This is the model for US suburban office development to evolve to.

JH: "Look at the coal industry lobbying, it's in the tens of millions. Plus, you have this complicated issue where you have to educate. So a public education campaign is expensive too. But, could an existing lobbying organization pull this off? Yes, possibly without too much additional funding. Probably need to get NY Times and Huff Post coverage. Need that for a break. Maybe some national figure could bring it into public discourse."

APPENDIX C. SELECTED REVIEWER COMMENTS

a) I found the concepts you present very interesting. I've always believed cash out could be a very effective strategy when it could be applied. But I confess I've been guilty of believing cash out has limited U.S. application due to the wide availability of free parking and the limited ability of suburban employers to save money by reducing their parking demand, because a large share lease rather than own their office space. Your paper presents an interesting long-term policy approach that could make cash out viable for a wider market in the growing number of "suburban edge cities." We certainly are seeing many more proposals for redevelopment of such places as Tysons Corner, VA, which you mentioned in your paper, that convert the "seas of parking" to a higher commercial use through in-fill. So I appreciate your creative thinking.

b) You highlighted many points that are ongoing concerns for cash out and suggested creative approaches to address them. You've also synthesized observations from diverse disciplines – unusual in our business. You present a concept that is food for thought and, I hope, for the subject of further research.

c) The proposed policy makes a lot of sense and may have some real legs.

The conclusion that \$4 cashout produces only 4% new green commuters, but \$4 cashout + \$2 parking charge produces 23% VMT reduction is startling.

The discussion about finding policies that are breakeven from a financial standpoint is useful. By charging a bit for parking, cash out could immediately be implemented in a breakeven manner for employers, even when some parking cannot immediately be shed.

d) A very interesting approach to parking fees, which can only be described as an art in dealing with the irrational parker's mind. Your sociological thoughts on this topic were insightful. Incrementalism is beautiful. The "break even" section is quite insightful

e) Much of the challenge is to implement efficient parking pricing in suburban commercial areas, instead of just parking pricing in downtowns. The proposal is great.

f) The proposal is very clever. The research is very good at explaining the practical implementation challenges.