

From: Mike Bullock, Retired Satellite Systems Engineer, 36 years Co-author, "A Plan to Efficiently and Conveniently Unbundle Car Parking Cost"

Subject: CEQA Guidelines Update

Dear Mr. Calfee and OPR:

I appreciate the opportunity to communicate with you on this critical topic. Your proposed draft work needs to reflect the numerical facts of our climate crisis and it also needs to result in policies that will achieve the needed driving reductions. Relief from current CEQA requirements should not come easily, if at all.

For example, the attached document "SDSC_toSANDAG_Re_CARB" (Ref(1) of this email) shows that by 2035, here in San Diego, a driving reduction of 35.1% (per capita, with respect to year 2005, per the SB-375 target-setting convention) is needed, to achieve the minimal trajectory acceptable, S-3-05. However, your proposed Appendix M requires a 25% per capita driving reduction with respect to the region's per capita driving. All state agencies must require that all regions achieve, at least, S-3-05. If a region's per-capita driving is too high, the 25% reduction may be unacceptable. Please come to grips with the sad reality that CARB's 2035 targets, because were too low to even get close to achieving S-3-05, destroyed the intent of SB 375, which was "Climate Protection". (Note that with atmospheric levels of CO₂ over 390 PPM, it is too late for "climate protection". We might still have a chance to stabilize the climate at a livable level. You must play a significant role for that to happen.)

To show what is needed, I have attached my comments to SANDAG's proposed RTP. They are in the "SCTC_toRR_DEIR" file, which is Ref(2) of this email. Its Section 2 again shows the calculation of the needed 35.1% per-capita reduction. Given our crisis, we need to achieve as much as reasonably possible, as soon as reasonably possible. This becomes clear with a careful reading of <http://www.aqmd.gov/ceqa/handbook/GHG/2009/april22mtg/CBDcomments.pdf>, and by also checking its references.

Please read Ref(2). Its Section 4 Conclusion, shown in Section 4.6, on Page 45, shows actions needed and the estimated per-capita driving reductions they would achieve.

These bullets, from that Conclusion, are directly applicable to your Performance Measures and to your Check List.

- 1.. Unbundling the cost of car parking; [15%] (This estimate is based on Table 1 of Reference 4.)
- 2.. Good bicycle projects and bicycle education; [5%,] (This estimate should be checked by the League of American Bicyclist.) The Projects you are evaluating for special treatment under a revised CEQA need to at least achieve the fundamental fairness and significant driving reductions that come with the first

bullet (unbundled parking cost) and should also offer the bicycle education class, which can also be described as teaching "Traffic Skills 101", as it is sometimes called.

Reference 2 has detailed information about these bullets, as will be shown in this email.

3.. Unbundling the Cost of Parking; unbundling the cost of parking is covered in Section 4.3 on Page 41 of Ref(2). More detail is shown in the attached file, "Manuscript19c" which is Ref(3) of this email. Ref(3) describes a state-wide (and beyond) system that should be of interest to your Office, if you want to do your part to solve our climate crisis. Ref(3) includes an implementation plan. That plan relies on having successful demonstration projects, such as is described in "Bullock2SM_BofTrustees3", which is Ref(4) of this email. No developer should be burdened with designing the systems described in either Ref(3) or Ref(4). Frankly, that is your job or perhaps the job of some other state agency. The developers and their tenants need only to agree to allow your installation of the system into their project, after your design is proven. This can be done with use permits.

Note that bundled parking cost is so unfair to those that drive less than average that it is a social justice issue that must be solved. In many cases, it is a civil rights issue. In some cases it violates equal protection of the law and is therefore unconstitutional. Climate destabilization is the "kicker" for the need for relief from bundled parking cost. Recall (if your are as old as I am, 66) that civil rights were not achieved with Incentives, Performance Measures, and a Checklist. Your current approach is too weak and will not come close to doing its part to solve our climate crisis, as it must.

4.. Good Bicycle Projects and Bicycle Education; the detail is shown in Section 4.4 of Ref(2). Again Use Permits are in order that require the perpetual availability and notice of availability for the classes.

Conclusion

Again, note that bundled parking cost (and road use cost) is so unfair to those that drive less than average that it is a social justice issue that must be solved. In many cases, it is a civil rights issue. In some cases it violates equal protection of the law and is therefore unconstitutional. Climate destabilization is the "kicker" for the need for relief from bundled parking cost. Recall (if your are as old as I am, 66) that civil rights were not achieved with Incentives, Performance Measures, and a Checklist. Your current approach is too weak and will not come close to doing its part to solve our climate crisis, as it must. As mentioned above, Use Permits will be required.

Please do not hesitate to call me if you have questions about this submittal. I would be happy to help in any way.

Sincerely yours,

Mike Bullock

References

Note: All References were attached in the email

- 1.) Letter, Sierra Club Transportation Chair to SANDAG Board, California Air Resources Board (CARB) Greenhouse Gas (GHG) Reduction Targets, Issued to SANDAG, in Accordance with SB 375, for the Year 2035, April 20, 2011

- 2.) M. Bullock to Rob Rundle, Comments Regarding the Draft 2050 Regional Transportation Plan EIR (the DEIR), Aug. 1, 2011

- 3.) M. Bullock & J. Stewart, A Plan to Efficiently and Conveniently Unbundle Car Parking Costs; Paper 2010-A-554-AWMA, from the Air and Waste Management Association's 103rd Annual Conference and Exhibition; Calgary, Canada, June 21-24, 2010; available upon request from Mike Bullock

- 4.) Letter, Bullock to the Honorable President Richard Holoher and Members of the Board of Trustees, San Mateo County Community College District; An Updated Parking Policy, in Light of the Controversy Surrounding the Removal of Building 20, Greenhouse, and Gardens, to Add Parking; July 27, 2011



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April 20, 2011

SANDAG Board of Directors

Via E-mail: pjo@sandag.org (Phillip Johnston)

Re: California Air Resources Board (CARB) Greenhouse Gas (GHG) Reduction Targets, Issued to SANDAG, in Accordance with SB 375, for the Year 2035

SANDAG Board Chair Jerome Stocks and Members of the Board:

I appreciate the opportunity to communicate with you concerning this important topic.

The subject targets were issued on September 30th of 2010. On September 20th, I sent a letter to CARB¹ asking them to issue targets that would uphold the Executive Order S-3-05² GHG reduction trajectory, for cars and light-duty trucks. CARB's Scoping Plan gives no reason to not apply the straight-line trajectory, implied by the S-3-05 reductions, to the GHG emissions from cars and light-duty trucks. S-3-05 names CARB as one of the agencies that must create plans and progress reports to ensure that the reductions in S-3-05 are achieved.

Unfortunately, CARB gave you (SANDAG) the Year 2035 reduction that you (SANDAG) requested, which is only a 13% reduction, for year 2035.

“GHG” is really “VMT” and Other Important Details on the Reductions

These reductions are per capita, with respect to *driving* in 2005. This can be understood by carefully considering the following two items:

- 1.) Page 8, of http://arb.ca.gov/cc/sb375/staffreport_sb375080910.pdf, which says, “The RTAC recommended that targets be expressed as a percent reduction in per-capita greenhouse gas emissions from a 2005 base year”; and
- 2.) The first footnote in the table of CARB calculations, <http://arb.ca.gov/cc/sb375/mpo.co2.reduction.calc.pdf>, which says: “The CO2 emissions presented in this table do not include reductions from Pavley and LCFS regulations.”

“Greenhouse gas (GHG)” emissions are used as equivalent to the more accurate “CO2 emissions.” In the second item, “Pavley” (named after Senator Fran Pavley) refers to a lowered average CO2 per mile driven. Also in the second item, “LCFS” refers to the “Low Carbon Fuel Standard”. Both “Pavley” and the “LCFS” reduce the emissions per mile driven. Since these reductions are not being counted, the reductions shown come only from per capita, percent reductions in driving, or “vehicle miles travelled”, VMT. Therefore the so-called GHG reductions are really VMT reductions.

¹ The letter is Reference 1, listed at the bottom of this letter and attached in the email with this letter.

² S-30-05 is shown in Reference 2, listed at the bottom and attached in the email with this letter.

More Background Information

In 2007, you (SANDAG) adopted your current Regional Transportation Plan (RTP). It includes a 38% increase in the total number of freeway-lane miles, in San Diego County. My job as Transportation Chair for the Sierra Club is to stop all freeway expansions, as specified in our National Policy. Our Chapter has commented extensively on the I-5 expansion Draft Environmental Impact Report. As you know, it would add either 4 or 6 lanes, to an eight-lane freeway, over a length of 27 miles.

You (SANDAG) are now in the process of approving a new RTP, with even more freeway expansions. However, your staff now claims that by Year 2035, they will reduce GHG (really VMT, as explained above) from cars and light-duty trucks by 19%. You (the SANDAG Board) and staff can therefore claim, correctly, that you are going to exceed your CARB target, for Year 2035.

However, the GHG reductions of S-3-05 must be achieved by mankind, if we are to have any reasonable chance of stabilizing our climate. A destabilization will likely have disastrous environmental and human consequences.

The purpose of this letter is to show you that the GHG (really VMT) reduction achieved must be at least 35%, not the 13% given by CARB and not the 19% that your staff now claims they can achieve by 2035.

Overview of Relationships and Derivation of Key Formula

The S-3-05 net reduction in GHG emissions, from cars and light-duty trucks, expressed as a fraction of 2005 emissions, is obtain by multiplying four factors together. The definitions of Table 1 apply.

Table 1 Factor Definitions, with Respect to Year 2005

| Factor Definitions | |
|--|--|
| <i>All are for for the year of interest, with respect to year 2005 values.</i> | |
| <i>Except for Population, all are for cars and light-duty trucks.</i> | |
| f | net factor of the emissions of Greenhouse Gas |
| f_Pavley | factor of the average statewide mileage |
| f_Fuel | factor of the reduction of GHG due to fuels that burn less carbon |
| f_Population | factor of the population in the region of interest |
| f_PerCapitaVMT | factor of per capita driving |

The following equations apply.

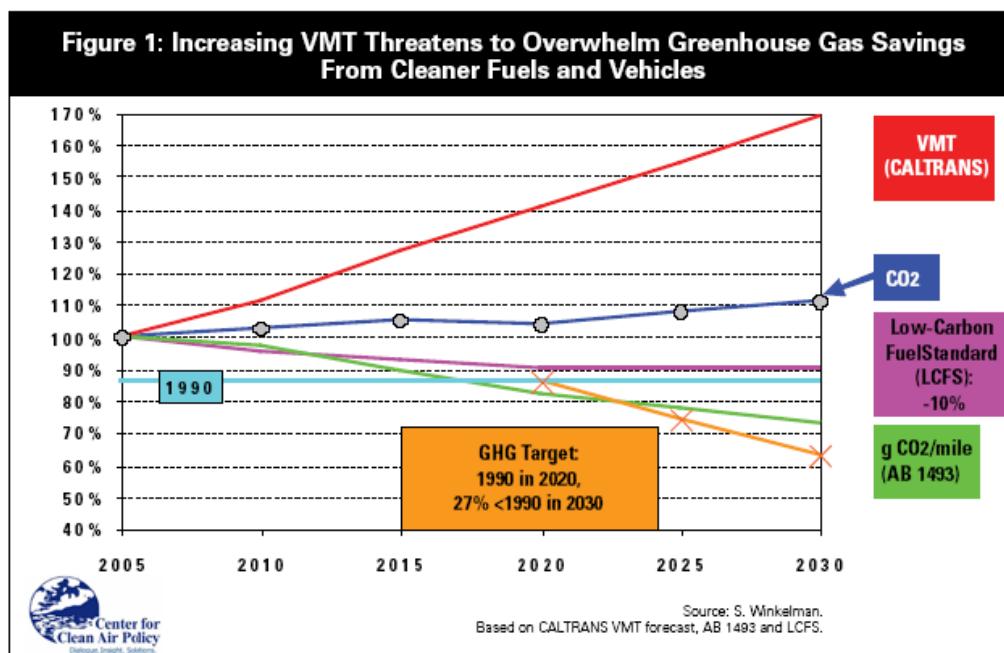
$$\text{Eq. 1} \quad f = f_{\text{Pavley}} \times f_{\text{Fuel}} \times f_{\text{Population}} \times f_{\text{PerCapitaVMT}}$$

Eq. 2 is derived from Eq. 1.

$$\text{Eq. 2} \quad f_{\text{PerCapitaVMT}} = f / (f_{\text{Pavley}} \times f_{\text{Fuel}} \times f_{\text{Population}})$$

Figure 1 is from <http://www.nrdc.org/globalWarming/sb375/files/sb375.pdf>, a widely-respected report on SB-375. Note that all of its values are in the units of factors (same as fraction) of their values in year 2005. Figure 1 will supply all of the needed values, except for the factor of population. (Neither the red line nor the blue line are used.) Its gold line is the S-3-05 trajectory that CARB ignored when it issued the driving reduction values for year 2035.

Figure 1 GHG Reductions from Pavley (AB 1493, in Green); the Low Carbon Fuel Standard (in Purple); the Predicted Driving (VMT, in Red); the Net Result of GHG (CO2, in Blue); and & the S-3-05 Trajectory (in Gold)



Getting the Net Factor of the Emissions of Greenhouse Gas in 2035, with Respect to 2005 Values

To get the net factor of the emissions of GHG, for year 2035, and with respect to year 2005, it is necessary to extrapolate the Governor’s Executive Order target values (the gold line of Figure 1), out to year 2035. The gold line shows that this factor is 0.87 in 2020 and is 0.64 in 2030. Therefore, in year 2035, the factor will be

$$0.64 + [(0.64 - .87) / (2030-2020)] * (2035-2030) = 0.525$$

Getting the Factor of the Average Statewide Mileage in 2035, with Respect to the 2005 Value

To get the Pavley reduction factor, for Year 2035, it is necessary to extrapolate the average statewide mileage factor data, which is Figure 1’s green line, out to Year 2035. It is 0.82 in 2020 and it is 0.73 in 2030. Therefore, in year 2035 the statewide mileage factor data will be

$$0.73 + [(0.73 - .82) / (2030-2020)] * (2035-2030) = 0.685$$

Pavley 1 ends in Year 2017. It is widely assumed that it will be replaced by what is often called “Pavley 2”. The extrapolation computed here is based on the assumption made by the author of

Figure 1, as shown in the slope of the green line from year 2020 to 2030. Based on the authoritative credentials of the authors of Figure 1, this is the best assumption that can be made. Assuming that the California fleet will continually get more efficient, in terms of CO2 per mile driven, relies on an assumption that a significant fraction of our car owners will be able to purchase newer-model cars.

Getting the Factor of the Reduction of GHG Due to Fuels that Burn Less Carbon

Looking at the purple line of Figure 1, it is clear that this factor will be 0.9 in 2035.

Getting the Factor of the Increase in Population

The factor for population in San Diego County is computed using the populations estimated in CARB's <http://arb.ca.gov/cc/sb375/mpo.co2.reduction.calc.pdf>, namely 3,034,388 people in 2005 and 3,984,753 people in 2035. So the factor, from 2005 to 2035 is $3,984,753/3,034,388 = 1.313$.

Computing the Required Driving Reduction, for 2035

The 4 values computed above are used in Eq. 2 to compute the required factor.

$$\text{Eq. 2 } f_{\text{PerCapitaVMT}} = .525 / (.685 \times 0.9 \times 1.313)$$

Therefore, $f_{\text{PerCapitaVMT}} = .649$. **This corresponds to a 35.1% reduction in per-capita driving, in year 2035.**

In Conclusion

You must not conspire with CARB to violate S-3-05. Your RTP must achieve a 35% reduction. Reference 1 shows how this can be done. You have a responsibility to get CARB and SANDAG back on a path of moral and responsible leadership. The current 2035 targets undermine S-3-05.

Respectfully submitted,



Mike Bullock, 760-754-8025

Chair of the Sierra Club San Diego Transportation Committee

References Attached with Email

Reference 1: PROPOSED REGIONAL GHG EMISSION REDUCTION TARGETS FOR AUTOMOBILES AND LIGHT TRUCKS PURSUANT TO SENATE BILL 375 (Released: August 9, 2010, for a September 23, 2010 Consideration) and the Failure of Its Proposed SANDAG GHG Reductions to Protect Health, Support S-3-05, and be Just and Reasonable

Reference 2: S-3-05, with additional comments

Copies: C. Chase, P. Epstein, Richard Miller

The San Diego Chapter of the Sierra Club is San Diego's oldest and largest grassroots environmental organization, founded in 1948. Encompassing San Diego and Imperial Counties, the San Diego Chapter seeks to preserve the special nature of the San Diego and Imperial Valley area through education, activism, and advocacy. The Chapter has over 14,000 members. The National Sierra Club has over 700,000 members in 65 Chapters in all 50 states, and Puerto Rico.





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August, 1, 2011

Rob Rundle, Principle Regional Planner
San Diego Association of Governments
401 B Street, Suite 800
San Diego, CA 92101

Via E-mail, rru@sandag.org

Subject: Comments Regarding the Draft 2050 Regional Transportation Plan EIR (the DEIR)

Dear Mr. Rundle:

I appreciate the opportunity to communicate with you concerning this important topic. Unfortunately, due to personal time constraints, I have found it necessary to restrict most of my attention to those sections of the subject document that deal with greenhouse-gas (GHG) emissions.

Introduction

Since understanding the relationship between global warming and transportation requires mathematics, I feel that it would be useful to give you a summary of my professional experience. I have a BSEE degree and a Masters of Science, Engineering (MSE) degree. I worked for 36 years at Lockheed Martin, in Sunnyvale. For the last 20 years or so I worked as a satellite-systems engineer. One of my responsibilities was to develop equations and methods to measure and then compensate out, through satellite database upload, the misalignments of the key antennas on the MILSTAR communication satellite.

As Chair of the Transportation Committee of the San Diego Chapter of the Sierra Club, it is my responsibility to speak for the Chapter on regional and local transportation matters. Therefore, I have spoken many times before your Board of Directors. In those speeches, I have repeatedly made the following points:

1. Above all else, SANDAG must adopt an RTP that will ensure that SANDAG does its part to stabilize the climate at a livable level.
2. This means at least achieving the reductions specified in the Governor's Executive Order S-3-05.
3. The SB 375 target, for year 2035, which CARB gave to SANDAG, as just 13%, would instead have to be 35%, in order to support the S-3-05 trajectory.
4. The above result is so important that SANDAG needs to evaluate its validity, by reviewing the mathematics shown in Reference 1, and reporting back its findings.
5. The money allocated to freeway expansion, including Managed Lanes, should be reallocated to build and operate transit

6. “Smart”, as in “smart growth”, needs to be defined as “VMT-reducing” so “smart growth” means “VMT-reducing growth”; therefore “smart” strategies and developments could be evaluated and ranked on a VMT-reduction-per-dollar-spent, basis.
7. Likewise, expenditures on bicycle transportation strategies should be evaluated and ranked on a VMT-reduction-per-dollar-spent basis.
8. When SANDAG draft reports are placed on line for public comments, all of the public submittals, that are of reasonable length and that are submitted in an acceptable format, should be placed on line for the general public, the media, and the Board to view.
9. Unbundling the cost of parking and driving is technologically feasible; is much more equitable than most current systems, which make it artificially cheap to drive and park; and is a strategy which would significantly reduce driving, air pollution and greenhouse gas (GHG), by giving people more choice over how to spend their own money.

Items 1 through 4 are documented in Reference 1. The Board has never responded in any way to any of these suggestions, requests, and facts. The Board majority seems unable to keep up with changing circumstances. It seems out of touch with emerging technologies. The Board majority needs outside help, a fresh start, and a new direction.

Questions

Please read each of the subsections of Section 1 and, for each subsection, please state whether or not you agree that this letter has identified a fatal flaw in the subject document, the DEIR. If you disagree, please explain why you disagree.

Please read Section 2 and, for each step in the mathematical derivation and calculation, please state whether or not you agree. If you disagree, please explain why.

Please read Section 3 and, for the mathematical derivation and calculation, please state whether or not you agree. If you disagree, please explain why. If you agree with the calculation, do you then agree with the conclusion that there is therefore no need to add freeway lanes? If not, why not?

For subsection 4.6, please state agreement or disagreement with each strategy. (Note that each strategy is mitigation and is also a component part of what I have named the “Equitable Alternative”.) If you disagree, please explain why, keeping in mind the explanations I have provided in the other subsections of Section 4.

1.0 Draft 2050 Regional Transportation Plan EIR Fatal Flaws

1.1 The subject document (the DEIR) fails to clearly identify and describe the short-term and long-term effects of GHG emissions.

The primary reason this is true is that the DEIR fails to describe the significant environmental impacts of climate destabilization. Climate destabilization is certain, at some point in time, if other agencies, states, and countries act with SANDAG’s irresponsible and criminally-negligent disregard for needed greenhouse gas (GHG) reductions. This failure to describe the severe danger of climate destabilization is a fatal flaw because Section 15126.2, *Consideration and Discussion of Significant Environmental Impacts of the CEQA Guidelines*, contains the following words:

Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential

development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services.

The harsh facts are that, unless curtailed, human-caused CO₂ emissions will amount to a self-inflicted genocide and all of the “relevant specifics of the area” (and all other areas) mentioned in the above sentence will be irreparably damaged or destroyed. Without successful, world-wide mitigation, the levels of GHG, expected in just 20 years, will result in a 5% chance of a 14.4 degree Fahrenheit increase in the earth’s temperature and this would be an utter catastrophe. It would create the possibility of a devastating collapse of the human population, perhaps even to extinction¹.

There is no excuse for the DEIR’s failure. Reference 2 (also shown on Pages 133 through 144 of Appendix A of the DEIR) explained what destabilization would mean and that this information needed to appear in the DEIR.

The strongest description of what mitigation failure would mean, in the entire DEIR, appears near the top of Page 4.8-2, where it refers to *dangerous* climate change. The reader may have no idea that in this case, “dangerous” could mean extinction of our species.

The following words appear on Page 4.8-13, as the last sentence under the “Adaptation Strategy” heading.

The strategy proposes a comprehensive set of recommendations designed to inform and guide California decision makers as they begin to develop policies that will protect the state from a range of climate change impacts.

The fact that is being left out is that adaptation will not work unless the world achieves mitigation strategies that are sufficient to stabilize the climate of our planet at a livable level. If other agencies, states, and countries perform as SANDAG performs, this will not happen and all adaptation strategies will fail. It is unacceptable that SANDAG’s sentence obscures this point, allowing the reader to remain delusional about the harsh realities or our climate predicament. The sentence tricks the reader into thinking that some “comprehensive set of recommendations” can actually “protect the state from a range of climate change impacts” regardless of how high we push the level of our atmospheric CO₂.

1.2 The DEIR fails to explain the urgency of our climate crisis.

This explanation is imperative, because this urgency means that there is no more time to put off adopting feasible alternatives that will achieve the needed reductions. The DEIR provides useful background information in Section 4.8.1. Section 4.8.1 is where the urgency should have been described. The section shies away from telling the harsh, unvarnished truth about the urgency of our climate crisis.

1.2.1 Data and Information that Would Help

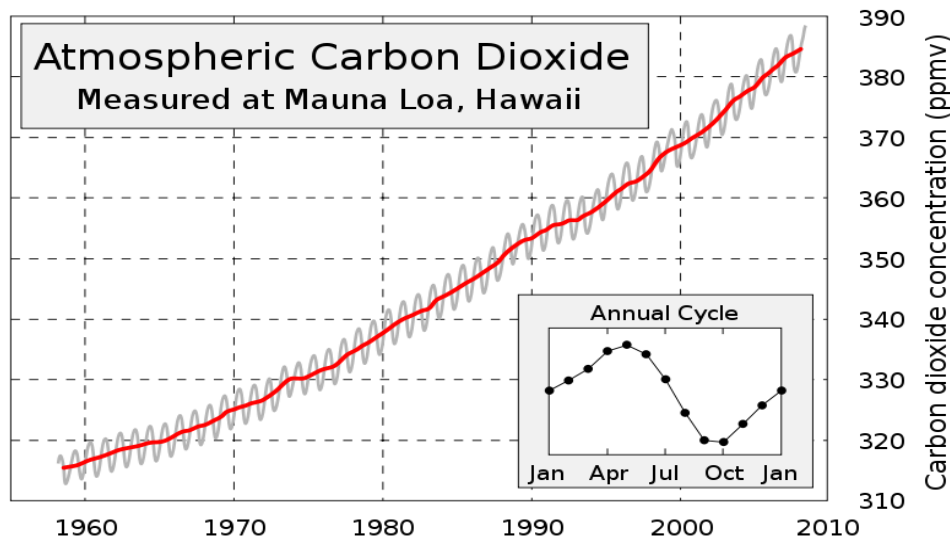
Figure 1, often called the “Keeling Curve”, shows that atmospheric CO₂ (shown in the units of parts per million, PPM) has been steadily increasing. Climate scientists have performed a precise inventory of humanity’s burning of fossil fuel². From this work, it was discovered that the slope was insufficiently steep, given our rate of burning fossil fuels. The reason for this is that about 25% of our CO₂ is going into the oceans. This fact is also an indication of urgency. The current rate of ocean acidification is larger than any measured in over a million years. The seasonal variation shown in Figure 1 is because there are more deciduous trees in the northern hemisphere than in the southern hemisphere. The Keeling curve has been called the most important scientific discovery ever made.

¹ *Scientific American, The Ethics of Climate Change*, Professor John Broome, June 2008, Page 100

² For example, when we burn a gallon of gasoline, we introduce nearly 20 pounds of CO₂ into the atmosphere.

Figure 2 shows atmospheric CO₂ and average yearly world atmospheric temperature, with respect to a recent yearly average temperature. The data starts 800,000 years ago. It shows that the current value of atmospheric CO₂, which is now actually more than 390 PPM, far exceeds the values of the last 800,000 years. It also shows that we should expect the corresponding temperature to eventually get to be about 12 or 13 degrees above current temperatures. This would be a human disaster, as shown in Reference 3³.

Figure 1 Atmospheric CO₂, Increasing Over Recent Decades



S-3-05, a California Governor's Executive Order, orders actions to ensure that Year 2020 levels of greenhouse gas (GHG) will be no more than 1990 emissions and that Year 2050 levels of GHG will be no more than 80% *below* 1990 levels. Reference 3 indicates that if the world achieves similar reductions, the earth's level of atmospheric CO₂ will probably be capped at 450 parts per million (PPM). Figure 2 shows the 450 PPM value. Unfortunately, 450 PPM is now known to be dangerous, as also shown in Reference 3.

The fundamental reason for the positive correlation between CO₂ and temperature, shown in Figure 2, (positive correlation means that they tend to move together), is that the atmosphere's CO₂ molecules will absorb and then emit infrared (IR) heat. In this way, the molecules trap IR heat that would otherwise escape out into space.

Reference 3 states, "Annual mean global temperature has increased by 0.76°C relative to pre-industrial times and is increasing at a rate of 0.17°C/decade."

Figure 3 shows the average (AKA "mean") yearly temperature difference from the recent, but before warming, temperature. It also shows atmospheric levels of CO₂. The S-3-05 goal of 450 PPM is literally "off the chart", in Figure 3. Figure 3 shows that temperatures are starting to follow the CO₂, as expected.

³ Specific consequences of a 2°C temperature rise from preindustrial levels include the loss of 97% of the world's coral reefs and the transformation of 16% of global ecosystems. Approximately one to three billion people would experience an increase in water stress, sea level rise and cyclones would displace millions from the world's coastlines and agricultural yields would fall in the developed world. At a global increase in temperature of 3°C above preindustrial levels, many additional impacts in human and natural systems would occur in ways exponentially more devastating than those predicted for a 2°C temperature increase.

Figure 2 Atmospheric CO₂ and Mean Temperature, 800,000 Years Ago, with 450 PPM CO₂ Shown

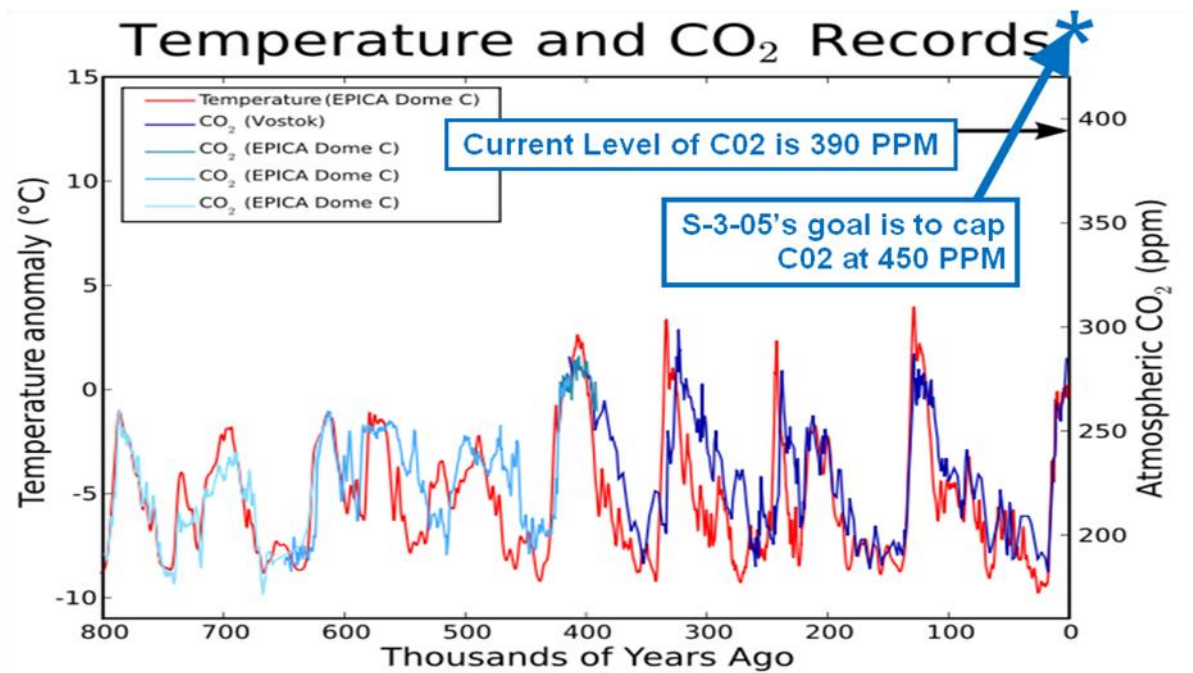
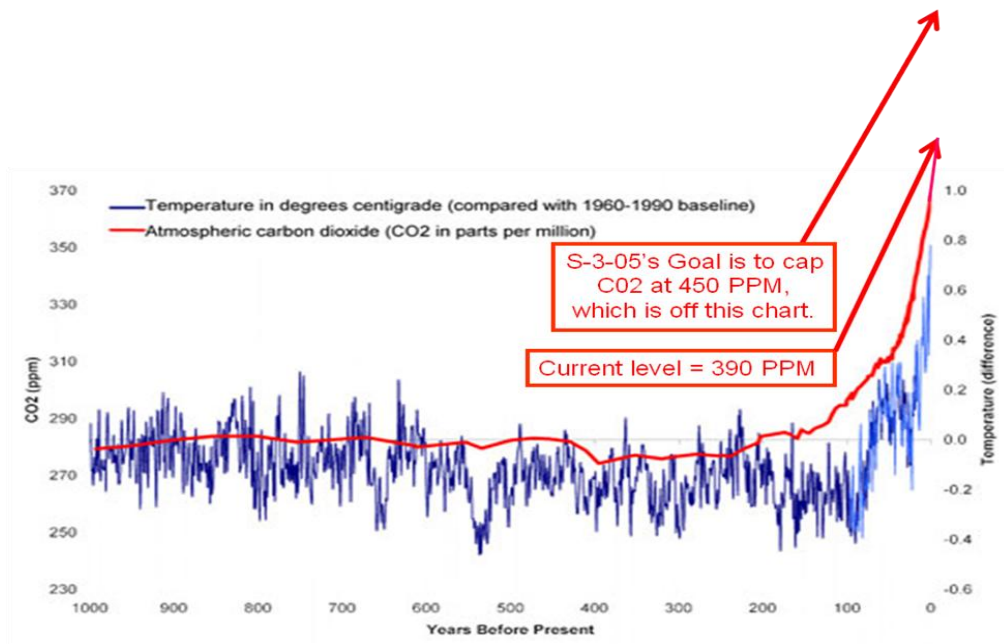


Figure 3 Atmospheric CO₂ and Mean Temperature, Over the Last 1,000 Years



1.2.1 Expert Opinion Supporting the Fact of Urgency

Figures 2 and 3 suggest that our current level of atmospheric CO₂ is already at a dangerous level and that we must quickly adopt strategies to reduce emissions. This apparent urgency is verified by many

statements in Reference 3, including the following, where “DAI” stands for “Dangerous Anthropologic Interference”:

On account of additional warming to which we are committed, Ramanathan and Feng found that there is a “high probability that the DAI threshold is already in our rearview mirror.” Similarly, on the basis of paleoclimate evidence and ongoing climate change, James Hansen and other leading climate scientists concluded the present CO₂ levels of 385 PPM are “already in the dangerous zone” and that “[i]f humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ will need to be reduced from its current 385 PPM to at most 350 PPM, but likely less than that.” In looking at dangerous climate change through the lens of risk tolerance, Harvey concluded that, at a 10% risk tolerance, atmospheric CO₂ concentrations close to present levels “violates the UNFCCC” for a range of assumptions of climate sensitivity. Accordingly, as the climate change to which we are committed is already dangerous, there is little scientific basis to conclude that any new source of emissions is innocuous.

1.3 The DEIR uses (at least) two significance criteria that are in violation of CEQA law.

Page 4.8-15 of the DEIR shows the following significance criteria.

GHG-2 Conflict with SB 375 GHG emission reduction targets

GHG-3 Conflict with applicable GHG reduction plans

Reference 3 contains the following words:

Under CEQA, regulatory standards can serve as proxies for significance where they accurately reflect the level at which an impact can be said to be less than significant. *See, e.g., Protect the Historic Amador Waterways v. Amador Water Agency*, 116 Cal. App. 4th 1099, 1109 (2004).

1.3.1 GHG-2

GHG-2 uses SB 375, which requires that CARB give SANDAG a target GHG reduction target for 2020 and 2035. This provides no significance criterion for the horizon year of the DEIR document, which is 2050. Furthermore, the target CARB gave to SANDAG, for year 2035, was given without considering the GHG reduction needed so that SANDAG’s RTP would do its part to prevent dangerous anthropogenic interference (DAI, as defined and used in Reference 3). Therefore, the regulatory standard selected cannot serve as a proxy for significance, because it does not come close to reflecting the level at which the impact can be said to be less than significant. As shown in Reference 1, in order to get the emission level from cars and light-duty trucks down onto the S-3-05 trajectory, the 2035 target would have to have been set to 35%, instead of the 13% value given to SANDAG by CARB. It would have been far better for the DEIR to have used S-3-05 for GHG-2, since S-3-05’s goal was to limit the levels of atmospheric CO₂ to 450 PPM and avoid the worst outcomes of DAI. However, as Reference 3 makes clear, even that criterion is in violation of CEQA law, because it is now understood that 450 PPM is dangerous.

1.3.2 GHG-3

The GHG-3 criterion would be marginally acceptable if S-3-05 were selected as the applicable GHG reduction plan and if CARB, Caltrans, and other responsible agencies were doing a credible job of implementing S-3-05. From S-3-05 comes the following implementation plan, as embodied by the “do hereby order” items 2, 3, and 4:

2. That the Secretary of the California Environmental Protection Agency ("Secretary") shall coordinate oversight of the efforts made to meet the targets with: the Secretary of the Business, Transportation and Housing Agency, Secretary of the Department of Food and Agriculture, Secretary of the Resources Agency, Chairperson of the Air Resources Board, Chairperson of the Energy Commission, and the President of the Public Utilities Commission; and
3. That the Secretary shall report to the Governor and the State Legislature by January 2006 and biannually thereafter on progress made toward meeting the greenhouse gas emission targets established herein; and
4. That the Secretary shall also report to the Governor and the State Legislature by January 2006 and biannually thereafter on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry, and shall prepare and report on mitigation and adaptation plans to combat these impacts

However, since CARB gave SANDAG a 2035 target that ignored S-3-05 (shown in Reference 1), any CARB plan is suspect and the best option is to use only the numbers in "do hereby order" of S-3-05:

1. That the following greenhouse gas emission reduction targets are hereby established for California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels.

This has legitimacy in that it is a plan that goes out to the horizon year of the subject document (2050) and its reductions are at least based on what can be assumed to be a sincere 2005 attempt to provide safety from DAI. SANDAG's decision to use CARB's Scoping Plan is flawed, because that plan says very little about what should be done after 2020. SANDAG's decision to use its Climate Action Strategy (CAS), http://www.sandag.org/uploads/publicationid/publicationid_1481_10940.pdf, adds nothing beyond S-3-05. It contains the S-3-05 reduction profile, in its Figure 3-1. By that measure the RTP fails in that its reductions fall far short of what is needed in 2035 and 2050. As stated, for 2035, 35% is needed (shown in Reference 1) but the RTP only achieves 13%. The 2050 RTP only achieves an 8% reduction in 2050. This means that the RTP is a failure at protecting us from climate change.

1.3.3 Use of S-3-05 for GHG-2 and GHG-3

Although adopting S-3-05 as a significance criterion would be of some value, Reference 3 shows that CEQA requires that reductions be larger than the S-3-05 targets, so that avoiding DAI can be guaranteed with a reasonable probability of success.

1.3.4 Possibly Legal Definitions of GHG-2 and GHG-3

GHG-2 and GHG-3 need to be replaced with 2020, 2035, and 2050 "GHG-Legal-Under-CEQA" levels that ensure, with at least a 95% probability, that DAI can be avoided, if other sectors here and all sectors in all countries, on a weighted average, achieve these same levels.

1.3.5 Domino Effect of Illegal Definitions

The DEIR's adoption of illegal significance criteria has potentially tragic implications. This is the first RTP with an SCS and other MPOs are observing to see what will be allowed. Likewise, S-3-05 is California's promise, to the other states and countries, that we will do our part to stabilize the planet's climate. Ignoring both S-3-05 and the science behind global warming, in the DEIR, shows that we have no intention of keeping that promise. If this is allowed to stand, it will give political strength to all the proponents of "business as usual" (BAU), in California, in other states, and all over the world. These BAU proponents can use this DEIR to urge others to stick with BAU, by following this DEIR's illegal methods.

1.4 The DEIR’s mitigations, on GHG impacts, as described in the DEIR’s Section 4.8.5 (and probably other mitigations on other impacts), violate CEQA law.

Within CEQA’s Section 15126.4, *Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects*, the following requirement is found:

- (a)(2) Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments.

This means that a claimed mitigation, which is no more than a listing of a collection of policies that “can and should” be enacted or that “aim” to reduce impacts, or some other similar word construct, which guarantees nothing, is illegal under CEQA. Yet that is all that is seen in the DEIR’s short (less than a page) Section 4.8.5, for the GHG impacts.

1.4.1 GHG-A

For example, after GHG-A, the DEIR states SANDAG shall update the future Regional Comprehensive Plan and RTPs/SCS to “incorporate policies and measures that lead to reduced GHG emissions.”

The key word is “incorporate”. SANDAG’s documents only describe policies that would reduce GHG, if adopted. “Incorporate” simply means to add to that list. There is no reason to believe that the SANDAG municipalities would actually adopt any of the described measures.

Saying that the next RTP/SCS will be somehow better begs the question as to why the current RTP/SCS didn’t have the solutions that seem to be promised as “mitigation” for this RTP/SCS.

1.4.2 GHG-B

For GHG-B, the DEIR says the following:

San Diego region cities and the County government can and should adopt and implement Climate Actions Plans (also known as Plans for the Reduction of Greenhouse Gas Emissions as described in CEQA Guidelines Section 15183.5 Tiering and Streamlining the Analysis of Greenhouse Gas Emissions) that contain the following information:

- a) Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within their respective jurisdictions;
- b) Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
- c) Identify and analyze the GHG emissions resulting for specific actions or categories of actions anticipated within their respective jurisdictions;
- d) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- e) Establish a mechanism to monitor the plan’s progress toward achieving that level and to require amendment if the plan is not achieving specified levels; and
- f) Be adopted in a public process following environmental review.

Note the “can and should” words at the top.

1.4.3 GHG-C

For GHG-C, the DEIR says the following:

SANDAG shall and implementing agencies can and should require Best Available Control Technology (BACT) during construction and operation of projects, including:

- a) Solicit bids that include use of energy and fuel efficient fleets;
- b) Solicit preference construction bids that use BACT;
- c) Employ use of alternative fueled vehicles;
- d) Use lighting systems that are energy efficient, such as LED technology;
- e) Use CEQA Guidelines Appendix F, Energy Conservation, to create an energy conservation plan; and
- f) Streamline permitting process to infill, redevelopment, and energy-efficient projects.

There are no estimates of how much GHG these actions would save. Pointing out that implementing agencies “can and should” take these actions is no guarantee that they will take any of these actions.

1.4.4 An Example of a Legal Mitigation

An example of a legal mitigation would be the adoption of a SANDAG policy that it will fund no highway construction or maintenance within a municipality until specific strategies, such as unbundling the cost of car parking, that have been found to give the needed driving reductions, are enacted and are being enforced.

1.5 The Alternatives in the DEIR have no obvious relationship to the Alternatives in the DEIR’s NOP (Shown in Appendix A of the DEIR)

1.5.1 NOP Alternatives and Claim

The NOP contains a discussion about each of the following Alternatives:

1. No Project
2. Intensified Land Use Distribution
3. Modified Transit Network Alternative
4. Transportation Demand Management/System Management

After listing these alternatives, the following words appear in the NOP:

Although these alternatives have been preliminarily identified, SANDAG is seeking input on the alternatives analyzed in the EIR, or modifications to the alternatives identified above.

1.5.2 DEIR Alternatives

The DEIR contains the following alternatives:

1. Alternative 1: No Project
2. Alternative 2a: Modified Funding Strategy/2050 Growth Forecast Land Use
3. Alternative 2b: Modified Funding Strategy/ Modified Land Use
4. Alternative 3a: Transit Emphasis/Modified Phasing/2050 Growth Forecast Land Use
5. Alternative 3b: Transit Emphasis/Modified Phasing/Modified Land Use Assumption
6. Alternative 4: 2050 RTP/SCS Transportation Network/Modified Land Use Assumption
7. Alternative 5: Slow Growth

1.6 The DEIR ignored the comments that appear in the Reference 2 NOP letter.

1.6.1 Background

There were 20 NOP comment letters from organizations and 2 from individuals. They are shown on 134 pages of Appendix A. I submitted a 12 Page comment letter, shown on Pages 133 to 144. The letter from the Sierra Club chapter is on Pages 115 to 123.

The Sierra Club letter states, in commenting on the NOP's TDM Alternative, "Under this alternative, the SDSC supports the comments provided by Mike Bullock with regards to pricing parking and driving, and incorporate those comments by reference."

Therefore, many of the comments in my NOP letter have the full endorsement of the 14,000-member Sierra Club San Diego Chapter.

1.6.2 Request for a Mitigation of Unbundled Parking Cost in the Intensified Land Use and Distribution Alternative

In my NOP letter, I asked that unbundling the cost of parking be included in the Intensified Land Use and Distribution Alternative. My NOP letter referenced Reference 4 (a 17 page peer-reviewed and published report), so that there was a complete description of what "unbundling" meant and exactly how it could be implemented.

1.6.3 Good Faith DEIR Response Not Made

The DEIR should have determined the feasibility of requiring municipalities to unbundle the cost of parking as a conditional requirement, for example, of receiving TransNet highway maintenance money, as a mitigation strategy.

1.6.4 Request for the Modified Transit Network Alternative and DEIR Response

For the Modified Transit Network Alternative, my NOP letter requests the consideration of new, fix-guide-way transit designs and unbundled parking costs, for the Coaster service. The NOP letter also states, under this alternative, that fundamental policy changes are needed in how governments price parking and driving. These considerations were not done. If they were done, they would lead to significant improvements in the RTP and DEIR and in the identification of significant, feasible mitigations.

1.6.5 Request for the TDM/System-Management Alternative and DEIR Response

For the TDM/System-Management Alternative, my NOP letter provided several pages of detail on how to reform how users pay for using roads and parking. Obviously, I wanted a strategy to achieve unbundling the cost of driving and parking to be included in any adopted RTP. I have repeatedly made this request in speaking publically to the SANDAG Board. The DEIR fails to act on this request or to even acknowledge that the request was made.

1.6.6 Additional, General Comments Receiving no Response

I also asked that the TDM/System-Management Alternative include a "Bicycle Alternative", although those comments, which were provided in over one page of compact directions, should be implemented in any alternative, to help realize the potential of bicycle transportation, in a cost-effective manner.

Like many, I stated that money allocated for additional highway lanes should be reallocated to expand transit and that the danger posed by climate change is much worse than how it is described in SANDAG documents.

1.6.7 DEIR Response to NOP Letter

For these 12 pages of NOP comments, that were supported by 5 reference documents, one a detailed description of how to unbundle the cost of driving, I was given the following summary, attributed to my NOP submittal, in your Table shown in Section A-2:

In terms of environmental justice, the EIR should mention the inequity caused by subsidized driving and parking.

Reducing GHG emissions must be a goal of the RTP.

I assume that I was treated no worse than others who submitted comments. This is not an acceptable way to respond to public comments to an NOP.

1.7 The DEIR fails to describe feasible mitigations, which could minimize significant adverse impacts, even though such mitigations have been identified by the public.

This violates Section 15126.4 of the CEQA Guidelines. It is also inexplicable, since such mitigations have been repeatedly communicated to SANDAG. It is also inexplicable that some of the mitigations that have been identified to SANDAG in responses to the NOP and in other letters have been misrepresented and then described as “infeasible”, in the DEIR.

1.7.1 Brief, Top-Level List of Mitigations

These described, feasible mitigations include those itemized in a presentation (Reference 5) that was made to SANDAG, on May 13, 2011, on Slide 9, shown in Figure 4.

Figure 4 Presented Feasible Mitigations to Achieve Driving Reductions that Will Support S-3-05



The ideas in Figure 4 are repeatedly presented to the SANDAG Board.

1.7.2 Detail for SANDAG to Add

Note that detail, such as requiring unbundling, on the part of municipal governments, as a condition of some advantage, such as getting TranNet money to pave streets, is left off of the ideas shown in Figure 4. However, this should be a simple addition for SANDAG staff to contribute. Also, the state can be requested to do its part in road-use pricing. Very soon they will have to comply, because falling gas-tax revenue from more efficient cars, S-3-05, and the science of global warming all require strong state action. The MPOs could help get the state to wake up to its responsibility.

1.7.3 A Detailed Mitigation Request from CNFF and the TranNet Tax

The “50-10 Plan” presented by the Cleveland National Forrest Foundation, calls for reallocating the TransNet Tax from freeway expansion to transit. This is briefly described here <http://www.signonsandiego.com/news/2011/jul/26/transit-first-plan-challenges-sandags-40-year-tran/>.

TransNet was passed in 2004, before the movie *Inconvenient Truth* was released. The general public had very little information about global warming at the time it voted on the measure. Fortunately, TransNet allows a reallocation of its funds, by a two-thirds vote of the SANDAG Board. This feature allows for a change, in case of an emergency or if an unforeseen event occurs. Our climate crisis is an emergency and few voters back in 2004 could have foreseen that the harsh realities of our climate crisis make freeway expansion an unreasonable alternative.

1.7.4 Other Detailed Submittals to SANDAG that Help to Identify Feasible Mitigations

1.7.4.1 Early Examples

Calls for improved parking policies and improved methods of charging for road use go back to the 2007 RTP. For example, an email of September 14th, 2007; Bullock to Rachel Kennedy, Associate Transportation Planner, SANDAG; *Draft 2007 Regional Transportation Plan (RTP) and its Environmental Impact Report (EIR)*, contains an extensive discussion on car parking cash-out and why driving should no longer be subsidized.

1.7.4.2 Submittal Regarding a Draft SANDAG Report on Its Climate Action Plan

More detailed comments on parking, reallocation of money for freeways to transit, road use fees, and bicycle transportation were sent in Reference 6. Reference 6 was emailed to SANDAG’s Andrew Martin, Coleen Clementson, and Bob Leiter. Mr. Leiter was, at that time, SANDAG’s Director of Transportation and Land Use. Mr. Martin is listed as an author of this DEIR, in Section 9.

1.7.4.2.1 Unbundling the Cost of Parking

This is from Reference 6, discussing parking policy:

For starters “Managing Demand” is an unfortunate choice of words. The fact is that demand for driving is being increased by current policies that do not allow employees, tenants, students, train riders, and consumers to observe and avoid, by not driving, the high cost of parking. There is also an “environmental justice” issue, in that policies that harm the environment are unfair to all, but are particularly unfortunate for low income citizens. Driving correlates positively with income. Very low income people are not likely to own a car. When these people spend money at the mall, with “free” parking, do they get a reduced price? If there is "free" parking where they work, do they get the \$4 to \$10 per day value of the parking? If they live in an apartment complex, where there is "free" parking, do they get the \$40 to \$100 a month they should get if they don't own a car? There are many reasons to eliminate or mitigate this economic discrimination.

Reference 6 also suggested that the Climate Action Plan (later named the “Climate Action Strategy”) include the following new section, to implement a cost-effective mitigation to unbundle the cost of providing parking facilities:

11 - Universal Unbundling the Cost of Parking

Summary Conclusion of This Section:

For many reasons, including the climate crisis driving the principle that we should reduce GHG “As Much As Reasonably Possible” (the AMARP principle), there needs to be a state government process (or regional) to produce a comprehensive description of an ideal, fully automated car parking system. (If the state will not do this then a set of cooperating MPO’s, or, if

needed, SANDAG alone must fund this effort.) Such an ideal system would fully unbundle the cost of car parking from all related money transactions in a way that: encourages the spontaneous sharing of parking; reduces driving to look for parking; limits parking-block occupancy to 85%; includes provisions for both on-street and off-street parking; protects struggling business districts; appeals to neighborhoods; requires no effort on the part of the drivers and those benefiting financially from parking, except to either pay their bills or cash their checks; mitigates impacts on low-income and handicapped drivers; and protect personal privacy. Reference 6 has a detailed description of such a system, although it needs more details in the equations that divide up the parking earnings among the individuals in the beneficiary groups.

I. Background Information:

1. The Threat of Global Warming and the Role of Driving in California

The June 2008 issue of *Scientific American* (*The Ethics of Climate Change*, by Professor John Broome) reports that the levels of GHG expected in 20 years will result in a 5% chance of a 14.4 degree Fahrenheit increase in the earth's temperature and this would be an "utter catastrophe" and create the possibility of a "devastating collapse of the human population, perhaps even to extinction".

Transportation produces 40% of California's GHG emissions and most of that is from cars and small trucks. The world's leaders know this. They will be more likely to adopt the measures needed to avoid climate catastrophe if California demonstrates an unwavering commitment to climate protection.

According to the testimony of Justin Horner, Policy Analyst for the Natural Resources Defense Council, *Reducing Congestion & Greenhouse Gas Emissions through Parking Policy*, presented to the California State Senate Transportation and Housing Committee on February 24, 2009, "reducing global warming pollution from the Transportation sector rests on a "three-legged stool" of cleaner cars, cleaner fuels and reductions in vehicle miles travelled (VMT).

Also, "All three strategies are necessary to meet AB32 goals and the goal set out in the Governor's Executive Order of 80% of 1990 emissions by 2050."

2. The Promise of SB375 and the Role of Parking

SB375 requires Metropolitan Planning Organizations (MPOs, such as SANDAG and MTC) to include a Sustainable Communities Strategy (SCS) in their Regional Transportation Plans. The intent is to decrease vehicle miles travelled (VMT) by increasing density, zoning for mixed use and infill development, and reducing local and regional jobs-housing imbalances.

The land available for development around transit stations is often expensive and car parking, which is generally provided free to the user, is often already in short supply. Surface car parking only parks 120 cars per acre. The per-space construction cost for a parking garage ranges from \$20,000 to \$30,000; while for underground parking, it is \$60,000 to \$90,000. Therefore, it would be advantageous to scale back the amount of the parking required for the various uses that might be desired around a transit station. However this will be difficult politically; no community wants insufficient parking.

Similarly, reducing the required parking in existing industrial parks (offices) could yield new land for infill housing. This would reduce the jobs-housing imbalance. If parking could be shared, it would create an additional efficiency, allowing for less parking. However, reducing the amount of required parking could probably not be done until it is demonstrated that there is more parking than is needed.

Mr. Horner's testimony states, "In *Growing Cooler*, the definitive work on the relationship between climate change and urban form, the authors conclude that smarter, more compact development can reduce household VMT by as much as 40%. While in some localities, the type of development envisioned in *Growing Cooler* requires zoning reform, many other localities already have zoning in place but find development intensities diminished, partly due to parking requirements."

From the Findings and Declarations of SB518 (Senator Lowenthal), "... parking requirements greatly expand the built footprint and increase travel distances, thereby increasing vehicle miles traveled and reducing the viability of alternate transportation modes."

Also, "The high cost of land, construction, and maintenance to provide free parking adds significantly to the cost of economic development, making many developments, especially those on infill or transit-oriented sites, financially infeasible and hindering economic development strategies."

3. Pricing Parking, an Important Tool to Make SB375 Successful

Mr. Horner's testimony states, "Since 1992, California law has mandated that certain employers offer parking cash-out (AB 2019, Katz), giving employees the option of a cash payment for their free parking space. In 1997, the California Air Resources Board analyzed several Los Angeles-area employers who participated in the program. Using surveys of employees before and after the introduction of parking cash-out, CARB's report noted a 17% reduction in solo driving and a 64% increase in carpooling. VMT dropped an average of 12% per employee per year, the equivalent of removing one out of every eight cars driven to work."

Referring to CARB's *Climate Change Scoping Plan, 2008*, Mr. Horner's testimony states, "But while many of the land use reforms envisioned in the Scoping Plan and SB 375 may take years to realize, parking reforms can be done now, at relatively low cost, and have a major impact. They are the proverbial low hanging fruit."

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."

Also from the Findings and Declarations of SB518, "The existence of "free" parking is a significant factor that encourages vehicle trips. At employment sites, employer-paid parking increases rates of driving by as much as 22 percent."

4. Reformed Parking Policies will Increase Fairness

From the Findings and Declarations of SB518 (Senator Lowenthal), "Free parking at stores is paid for by all customers in higher prices for goods, including those customers who do not drive. Free parking in housing developments is paid for by all residents, even those who do not drive. Free employer-provided parking is paid for by lower wages for all workers, including those who do not drive. Free on-street parking is paid for by the entire community in the form of taxes."

Again, Mr. Horner's testimony states, "By encouraging driving, free parking also creates a number of driving-related externalities, including collisions and collision-related injury, conventional air pollution and greenhouse gas emissions."

5. Drawbacks to “Best Practice” Car Parking Cash-out

Current, state-mandated parking cash-out (AB 2019) rarely applies. AB 2019 only applies if companies have at least 200 employees, own no parking, are leasing a building that has no parking, and are leasing parking for their employees in a contract that allows them to change the number of parking spaces being leased, with no economic penalty. It is easy to design a contract that makes AB 2019 inapplicable. Despite this, companies that own or lease buildings with parking have occasionally elected to pay their employees extra money for not driving. However, these companies are free to pay any amount, including one so low that it will not reduce driving significantly. Unbundling the full cost of the parking for employees requires reasonable estimates of the per-unit-time value of the car parking.

6. Drawbacks to “Best Practice” Unbundling

Again, Mr. Horner’s testimony states, “unbundling separates the cost of parking from the total cost of housing. This rewards those who do not choose to own a car with more affordable housing, while transferring to car owners the true, rightful cost of owning an automobile.”

The problem with this method of unbundling is that it does not encourage the spontaneous sharing of parking. If a condominium owner elects to buy a parking space, it is theirs, full time. Likewise, if an apartment resident elects to rent a car-parking space, it is theirs, full time.

This type of unbundling is better than bundled parking cost, but it is not optimum because it does not support the spontaneous sharing of parking.

7. Drawback to Current Systems of Timed Parking and Timed, Pay Parking

About 67% of the money collected in parking meters is spent on collection and enforcement. Time limits on parking detract from a driver’s enjoyment. The driver has to note when they started to park and then, as the time left gets short, they have to worry about getting an expensive parking ticket. Only rarely does a driver know exactly how long they will want to park. These types of concerns detract greatly from the downtown experience. Drivers either have to drive away with time left on their parking meter or risk getting a traffic ticket. Getting coins for a meter is sometimes difficult. Pay stations are better, but even the most advanced systems are still difficult. For example, motorists in Coral Gables, Florida can register their cell phones, credit cards, and license plates and then call in when they pull into a parking place and then call again, when they leave. This eliminates overpaying or underpaying and getting a ticket, but it is still difficult, because two actions are required. It is always better to do nothing and have the perfect outcome ensue.

8. Poor Record Keeping

Generally, there are no records kept of how much money any given parking space is earning. Free parking is also generally unmonitored. Cities pay significant fees to have consultants come in and count parked cars to determine such things as how often (and when) “free” parking is being used, how well time limits are being adhered to, and other questions that could easily be answered by computer programs when automation is installed.

9. “Congestion Priced” or “Convenience Priced” Parking

This means that the base price is instantaneously increased to prevent the occupancy rate from getting too close to 85%. This maximum occupancy rate has been identified by UCLA Professor Donald Shoup. Keeping occupancy below this threshold guarantees that anyone that is willing to pay a premium price can find a parking place, even in high-demand areas, without needing to drive around looking for a parking space. Tables 2 and 3 of Reference 6 provide the algorithms.

10. How to Fully Unbundle the Cost of Parking to Support Sharing

The full cost must be visible and avoidable. Here's what this means in more detail.

a. Requirement 1

The base, per-unit-time price (before any congestion-price increase) must be at least the current cost to provide the parking multiplied by the time rate cost of money, divided by the fraction of the time that the space is rented.

b. Requirement 2

In order to state the second requirement, it is useful to define the term, "beneficiary group". The beneficiary group is generally that group of potential users that *paid for* the parking, either directly or indirectly; or those that *are paying* for the parking, either directly or indirectly. The exception is at, for example, a school or a transit station. In these cases, the potential users have *not* paid for the parking. However, since the baseline is "free" parking, it is clear that the providers of this parking (often tax payers) are content to (in effect), "give" the parking to the groups using the facility. The second requirement can now be stated. The parking-lot earnings should be divided up among the members of the beneficiary group that is associated with the parking.

c. How to Compute Each Beneficiary Group Member's Share of the Parking Lot Earnings

The formulas used to divide up the money among the members of the beneficiary group should reflect either the extent to which they paid, the extent to which they are paying, or the extent to which they are consumers of the service associated with the parking. For example, students would receive earnings in proportion to the time they spend at the school. Train riders would receive earnings in proportion to the amount of time they spend on round-trip train rides. Shoppers would get earnings in proportion to the amount of money they spend. Renters would get earnings in proportion to the amount that their rent is paying for parking. Condominium owners would get earnings in proportion to the amount that their purchase price paid for parking. Employees would get earnings in proportion to the amount of wage they are losing so that the parking can be available. Alternatively, employees could get earnings in proportion to the amount of time they spend at work.

d. Why This Method of Unbundling Supports Sharing

With this method, sharing is acceptable to the beneficiary group, because they are earning money from anyone who uses the parking.

11. Concerns for the Economic Health of Downtowns

Merchants and their advocates within government often fear that charging for parking will cause potential customers to go to locations with "free" parking. For this reason, it is important that on-street parking be free until it is 50% full, at which point it is assigned a base price equal to the base price of the closest off-street parking.

12. Helping Potential Drivers Decide Whether They Want to Drive and If So, Where to Park

Software can be developed so that a potential user can specify time, place, (or a set of time and places) and desired price and be given (on a computer or on a phone) parking locations, with a probability of accuracy. It will also give transit information. This will encourage "park once" behavior, walking, and a rational decision as to whether or not the trip should be made by car. It will minimize driving because no search for parking will be necessary.

II. Arguments in Favor:

1. Global Warming Imperative to Eliminate “Free” Parking

The background material makes it clear that “free” parking must be replaced with priced parking if California is going to meet its AB32 responsibilities.

2. Overcoming Resistance

There is sure to be resistance to this idea. That resistance will be minimized by defining each type of parking’s beneficiary group and then operating the parking for the benefit of those in the beneficiary group. It will also be minimized if the parking is fully automated so that those that are paying for the parking are getting convenience. Those earning extra money are sure to be pleased. Those paying more than they are earning from the parking will understand that the new system allows them to no longer take money unfairly from their beneficiary-group colleagues that drive less.

3. Sharing of Parking, Protecting Low-Income Drivers, Handicapped Drivers, and Privacy

This method of unbundling will support sharing. Sharing of parking will allow less parking to be built. This will support the goals of mixed use and increased density, especially around transit stations. Since all potential drivers must have a “billing address” (some will never get a bill; they will only get a check), it will be easy for the system to also identify handicapped or low-income drivers. These drivers will get either a reduced rate or free parking. Privacy will need to be protected.

Congestion (or “Convenience”) pricing should be supplied so that occupancy rates are held below 85%. This will help to minimize driving to look for parking. It will also maximize the earnings for beneficiary groups that are lucky enough to be associated with parking that is well used.

Business districts will be less opposed if they see that if there is light demand for parking, no charge will be applied for the most convenient parking, which is on-street parking.

4. Parking at Train Stations

Paying riders that ride round trip their fair share of the parking lot earnings will mean that the parking lot is being operated to maximize ridership. If the parking is being offered at no charge, the parking is being operated to maximize driving to the station. With the charge, those that can get to the station without driving will be more likely to do so, leaving more parking for those that must drive. Those that must drive will be guaranteed a space, thanks to “convenience pricing”. Convenience Pricing will also mean that each block of parking will have vacancy. This means that if a driver wants to spend “top dollar” for parking and park, for example, very close to the station platform, so as to catch a train, that option will be available. If the station happens to be in a downtown area, many of the cars in the parking lot will belong to those using the downtown. This will not hurt the riders because it will mean that they will earn more money from the parking. It is conceivable that the train riders could ride for almost no net money, if they get to the station without driving.

5. Purpose of Getting a Comprehensive Description

The description can be viewed by local governments, developers, and private investors. It can be used as a requirements document to support a full design and development. There can be a “request for proposal” (RFP) process. Parts of the resulting designs may lead to patents. The first

companies that implement these systems will have an advantage in implementing them in other locations. Since car parking is known to exist almost everywhere, the business opportunity that this represents is nearly unlimited. Once the system has been shown to please all stakeholders in a real implementation, it will be time for the state to create an agency to implement these systems at the locations of their choosing. State law will require the cooperation of all concerned. This means that companies will get this ideal system installed for free, by doing almost nothing. This will similarly be true for all other types of locations.

6. Letter Showing that the Required Technology Could Be Easily Developed

----- Original Message -----

From: [David Carta](#)

To: ['Lisa Rodman'](#) ; ['Mark Tanner'](#) ; ['Kelli'](#) ; ['Nicole'](#) ; ['Mark S.'](#) ; ['John'](#)

Cc: ['Mike Bullock'](#)

Sent: Wednesday, January 13, 2010 5:40 PM

Subject: RE: RFID_ParkingNewCalsbadHS

Dear Carlsbad School Board,

I wanted to send a quick note discussing the technical feasibility of tracking cars into a lot without impacting students or requiring the need for gates. Mike Bullock and I have discussed this project; it can be accomplished straightforwardly by utilizing Radio Frequency Identification and/or Video Cameras integrated with automated license recognition systems. The cars would need to register with the system at the start, but it would be fairly painless for the users after the initial installation. The back end database system can also be implemented both straightforwardly and at a reasonable price.

This is not necessarily a recommendation of the proposal for unbundled parking. Rather it is strictly an unbiased view of the technical feasibility of the proposal to easily and unobtrusively track cars, both registered and unregistered, into a fixed lot.

Best regards,
David R. Carta, PhD
CEO Telaeris Inc.
858-449-3454

1.7.4.2.2 Unbundling the Cost of Driving

Reference 6 also suggested that the Climate Action Plan (CAP, later named the Climate Action Strategy, CAS) include the following new section, to implement a cost-effective mitigation to unbundle the cost of providing roads. Note that the use of the word “unbundling”, in the heading above, denotes that the money collected should be paid out to those that are losing money under the current system, besides doing the needed maintenance. This means, for example, that the money collected to account for increased health-care costs, caused by the air pollution the public must breathe, would go to reduce the cost of health care, not to build or even maintain roads. What follows is the new “Section 12” that was suggested for the CAP, in Reference 6. Note finally that “AMRP” stands for “as much as is reasonably possible”.

12 - Comprehensive Road-Use-Fee Pricing System

Abstract This section contains a listing of road pricing principles. It provides an example of a road-use fee structure that supports the listed principles. Useful background information is provided. Arguments in favor of the presented example are presented.

Initial Note For many reasons, including the climate crisis and the “AMRP” principle stated above, a comprehensive road-use fee pricing system is needed. It would be optimal for the state to implement the type of system described in this section. However, the state has a long history of irresponsibility in pricing road use. It is hoped that global warming will change this. Certainly, all the MPO’s in the state should be urging our state government to wake up and take action. If these efforts fail, the MPO’s will have to proceed as best they can to implement as much of these road-use pricing system components as possible.

I. Road-Use Fee Principles

1. The first principle is that of “full-cost pricing”. Driving has enjoyed a favored status in this state and in this country, resulting in sprawl, health-damaging pollution, global warming emissions, and congestion. We should advocate for the elimination of that favoritism in California, primarily by adopting this first principle.
2. Secondly, the current economic rewards for good mileage vehicles must not be eroded. Due to global warming, motorists need to “go electric” as soon as possible.
3. In addition, road-wear factors (primarily weight), the noise generated, and the pollution generated by each individual vehicle must be taken into account. This will increase fairness and support a shift to lighter, cleaner, and quieter vehicles.
4. The time and place of travel must be incorporated to reduce congestion.
5. Any road-use fee structure must do no economic harm to low-income drivers.
6. As road-use fee technologies evolve, privacy must be protected at each step.

II. An Example of a Conforming Road-Use Fee Structure

Condition 1

100% of the funding for all of the expenses of public roads, *excluding* those costs associated with future expansion (covered in Condition 3), comes from a road-use fee (that may include a fuel excise tax), that ultimately (as affordable technology can support) would contain the following **Features**:

- 1. VMT Fee** A base, per-mile (VMT) component fee paid by all motorized vehicles for road construction and maintenance.
- 2. Carbon Fee** An additional per-mile carbon component part is computed using an effective fee per gallon that is equal or larger than the fuel tax that this per-mile carbon fee might replace, to correlate with the amount of CO2 emitted. This could either be charged at the pump, as it is now done, or could be added to the VMT fee by using a price per mile computed by dividing the effective price per gallon by the charged vehicle’s (year and model) average mileage, in the units of mile per gallon.
- 3. Road Wear Fee** An additional per-mile component part that is proportional to the vehicle’s (year and model) average weight, or other road-wear variable of the vehicle being charged.
- 4. Air Pollution Fee** An additional per-mile component part proportional to the charged vehicle’s (year and model) average pollution level, to be used to compensate people, schools, businesses, governments, and corporations harmed by pollution, with this rate set for full compensation.

5. Noise Pollution Fee An additional per-mile component part proportional to the average noise pollution level of the charged vehicle, to compensate people, schools, businesses, governments, and corporations harmed by noise pollution, with the rate set for full compensation.

6. Congestion Fee An additional per-mile component part or, alternatively a multiplier, to account for either time and place, or instantaneous traffic flow rate, to reduce or eliminate congestion, with the proceeds of this fee (collection minus collection cost) used for either the expansion or the operation of transit systems that would tend to reduce this congestion.

7. Low Income Relief A fractional multiplier that would reduce the total per-mile cost for drivers with a sufficiently low income and a sufficiently high need to drive, but only available for a period of calendar time sufficient for the driver to change their circumstance creating the need to drive, unless this is impossible. Section V's Section 7 has more detail.

8. Privacy Privacy protections so that where and when people drive, the vehicle they drive, and any Feature 7 advantage, is fully protected, unless a warrant is issued by a judge in response to substantiated allegations of a serious, felony crime.

Condition 2

The per-mile charges of Condition 1 must be large enough to fund yearly payments to the municipalities having large, limited access roads (AKA "freeways") within their boundaries (thereby keeping land off of their property-tax rolls), with these yearly payments equal to the average yearly property tax per acre of the adjacent land, multiplied by the total acreage covered by the road's right of way, including frontage roads.

Condition 3

No expansion of the system of public roads should be done unless market research and traffic modeling show that the net revenue of the proposed road or additional lanes will fund all the expenses identified in Conditions 1 and 2.

Condition 4

No expansion of the system of public roads should be done unless it is shown that the expansion will not negatively impact the state's AB32 goals and responsibilities.

Condition 5

The sales tax on gasoline and diesel fuel should remain. Its revenue can be used as is the revenue from any other sales tax that is collected on consumer items.

III. Background Material

This section provides information about the current level of the fuel tax, the difficulty of raising the fuel tax, the use of the fuel *sales* tax, lane performance during times of high demand, demand under the condition of "full cost pricing", political "push back" to full cost pricing, other opinions that a pure fuel tax is becoming obsolete, and finally, information indicating that a road-use fee could be raised by a simple majority in the state legislature.

1. Current Level of Fuel Excise Tax

A full accounting of the fuel excise tax and what it currently pays for is not our responsibility. A significant segment of the population probably believes that current fuel tax rates are high enough. However, a San Diego County newspaper, the North County Times (NCT), in a February 9, 2009 article, reported that the Chair of the California Transportation Commission

(CTC) recently wrote that the fuel tax currently contributes nothing to road construction **and only provides half of the money needed annually for repairs:**
<http://www.nctimes.com/articles/2009/02/09/news/columnists/downey/z8591536f3e7332da882575510076fa1e.txt>

Increasing the state gas and diesel taxes, unchanged at 18-cents per gallon since 1994 – when the final one-cent increase mandated by Proposition 111 (June, 1990 that doubled the nine-cent excise fuel tax over a 5-year period) was added, is long overdue.

2. The Difficulty of Raising the Fuel Tax

To raise the fuel tax would require a 2/3rd majority vote of the legislature. In addition, according to a CNN report, <http://www.cnn.com/2009/POLITICS/02/20/driving.tax/>

“Officials including [Secretary of Transportation] LaHood have opposed raising the national gas tax, particularly in the current recession, and have said a new system is needed.”

3. Use of the Fuel Sales Tax

California has a sales tax on all consumer items sold in the state, except food and medicine. The revenues from sales taxes are generally placed in our state’s general fund. However, an exception to the general rule has been made for the sales tax on gasoline and diesel. By the conditions of a successful ballot measure, the sales tax on fuel must be used to support roads, which supplements the excise tax on fuel (also known as the “gas tax”), allowing the excise tax to be lower than necessary.

4. Lane Performance During Times of High Demand

From the DOT’s Freeway Management and Operations Handbook:

http://ops.fhwa.dot.gov/freewaymgmt/publications/frwy_mgmt_handbook/fmoh_complete_all.pdf, Page 1-18, comes the following:

As flow increases from zero, density also increases, since more vehicles are on the roadway. When this happens, speed declines because of the interaction of vehicles. This decline is negligible at low and medium densities and flow rates. As the density further increases, these generalized curves suggest that speed decreases significantly just before capacity is achieved, with capacity being defined as the product of density and speed resulting in the maximum flow rate. This condition is shown as optimum speed S_o (often called critical speed), optimum density D_o (sometimes referred to as critical density), and maximum flow V_m . (7). In general, this maximum flow (i.e. capacity) occurs at a speed between 35 and 50 mph.

Efficient freeway operation depends on the balance between capacity and demand. In the simplest terms, highway congestion results when traffic demand approaches or exceeds the available capacity of the highway system. As vehicle demand approaches highway capacity, traffic flow begins to deteriorate. Flow is interrupted by spots of turbulence and shock waves, which disrupt efficiency. Then, traffic flow begins to break down rapidly, followed by further deterioration of operational efficiency.

For the purpose of this resolution the most important result is that when demand is allowed to significantly exceed capacity, the flow rate drops well below optimum. In fact, speed can drop to nearly zero. With no intervention, freeway lanes can be counted on to fail, just when they are needed the most.

5. Demand, Under the Condition of “Full-Cost” Pricing

The price-setting stipulations of Section III's Features 1 through 6 of Condition 1, in conjunction with Condition 2, could be described as "full cost pricing". It is not our responsibility to do an analysis to calculate what the average price per mile would need to be or to then determine how much driving would be reduced in reaction to this price. It could be that driving would decrease so much that congestion would disappear and the new problem would be to figure out what to do with the excess land buried under unneeded highway lanes and how to meet the large new demand for transit.

6. Political Pushback to the Notion of Full-Cost Pricing

There are many, well-funded "think tanks" and political figures and institutions that argue against raising the cost of driving. So far they have been largely successful in keeping the taxes on driving low.

7. Other Opinions That a Pure Fuel Tax Is Becoming Obsolete

There are many indications that more decision makers are adopting the view that the fuel tax either needs to be replaced or supplemented. We have undertaken no comprehensive search and evaluation to quantify this. However the following examples are presented, with the first three being taken from the same NCT article identified in Section-1 of this Section.

First the Chair of the CTC pointed out that, "People are driving more-fuel-efficient cars and ones that run on alternative fuels and buying less gas. As a result, they are paying less in gas taxes". The author of the NCT article states that the CTC Chair and others are calling for "phasing out the gas tax," in favor of a VMT fee.

Second, Will Kempton, director of the California Department of Transportation, told local officials in Valley Center recently "we need to make a transition to a new way of collecting transportation funds." Kempton also said the state should consider following the lead of Oregon, which is exploring a tax based on the number of miles a person drives.

Third, Jim Earp, a California Transportation Commission member from Roseville, added, "Either that or we're going to have to jack up the gas tax considerably."

Fourth, the Christian Science Monitor editorial, February 27, 2009, "A road map to better US roads," says, "Congress should heed a panel that suggests replacing a tax on gas with one on miles driven."

<http://www.csmonitor.com/2009/0227/p08s01-comv.html> It goes on to say, "In Europe, the Netherlands will transition to a VMT by 2014 and Denmark by 2016. Changing behavior is the key to 21st century transport that must unclog crowded highways and reduce dependence on fossil fuels. Taxing miles alerts drivers to the real cost of using roads and can better motivate them to drive less. A VMT (fee) is the more reliable and efficient way to pay for transport. Its time has come."

Finally, according to a CNN report, <http://www.cnn.com/2009/POLITICS/02/20/driving.tax/>,

Speaking to The Associated Press, Transportation Secretary LaHood, an Illinois Republican, said, "We should look at the vehicular miles program where people are actually clocked on the number of miles that they traveled."

8. Raising a Road-Use Fee Could Be Done By a Simple Majority

The Sacramento Bee printed an article by Dan Walters, on January 20th, 2009, describing a proposal to help close California's budget gap.

<http://www.nctimes.com/articles/2009/01/20/opinion/walters/zd5e9d64561b6efd78825753e006c951a.tx>.

The key elements from the article are as follows.

- 1.) Senate President Pro Tem Darrell Steinberg, the scheme's father, insists that it's legal, basing that assertion on a 5-year-old opinion from the Legislature's legal office.
- 2.) The plan would eliminate excise and sales taxes on gasoline and raise other taxes to help close the budget deficit, then "backfill" the gasoline taxes with a new "fee" that would actually increase the bite on motorists by 50 percent, from 26 cents a gallon to 39 cents. **A "fee" can be imposed by a simple majority vote as long as it relates to actual services rendered by government.**

Note that this fee approach is relatively far from meeting all of the stipulations of this report. However, it would represent significant progress.

IV. Arguments in Favor of Road Use Fees

This Section provides an analogy demonstrating why roads should be operated for the equal benefit of all. It presents some of the consequences of the current level of our state fuel tax. It argues that a road-use fee should include a vehicle miles traveled (VMT) component and that furthermore, a component should relate to congestion pricing (i.e. needs to account for *specific* time and place of travel). A road-use fee should account for environmental impacts, should protect low-income families, and contain privacy protections. It explains why revenue from a road use fee should be used to pay an effective property tax to municipalities. It argues that this resolution offers methods that would help to alleviate the state's budget problems. It states that it is easier to discuss setting a road use fee than it is to discuss increasing an excise tax on fuel. Finally, it briefly discusses some of the emerging technologies and the relationship between technology and this resolution.

1. Full-Cost Pricing

Roads should be priced so that they are no longer an economic burden on those that choose to drive less than average. Yet, it is hard to be objective about roads. Here's an analogy. Assume that California owned a large number of 2-bedroom apartments that it allowed families to live in if they paid a tax of \$500 a month, even though the market rental value of the apartments was \$1000 a month. Clearly, the people living in the apartments are the winners and all the other citizens of California are the losers, because if the state set the price to the market value, it would have additional money that it could either use for the benefit of all citizens or it could return the money to everyone as a tax rebate. Some might note that since there are a large number of these apartments, almost everyone that wants one could get one, so those that don't live in these 2-bedroom apartments are losing out because of their own poor choice. However, since not every citizen wants to live in these apartments, the State's practice is indefensible. The correct thing for the state to do would be to allow low-income citizens to remain in the rental units at the subsidized price of \$500 a month, stop calling the price-per-month a "tax" and instead call the price-per-month a "user fee", and set the price for the families that are not low income to the market value of \$1000 per month. In this case, the low-income families remain winners. Even though all the others are losers, they are losing much less than before. This assumes that the state takes the additional earnings and uses it in a way that benefits all citizens. Buying more 2-bedroom apartments would not qualify. This analogy's original operation is similar to what California does by under pricing road use fees, as described below.

2. Consequences of the Current Level of Fuel Tax

a. Economic Inequity

Because our state fuel tax is too low, funds derived from taxes (and fees) that are not related to the choice of driving a car must be used to support our system of public roads. Examples are our sales tax, our income tax, our property tax, and the development fees that increase many of our costs. In effect what is happening is that money is systematically *being taken* from those that drive less and *being given* to support those that drive more.

This violates a fundamental principle of our free market system. People should pay for what they use and, conversely, people should not be forced to pay for what they do not use. It is true that we often willingly violate this principle, for some higher purpose. Education, mass transit, and Section 8 housing are good examples. However, there is no valid reason to increase driving by making it artificially cheap to drive, or for that matter, to park a car. The facts about global warming suggest quite the opposite.

b. Global Warming Threat and the California Example of Road-Use Pricing

According to an article in the June 2008 issue of *Scientific American*, *The Ethics of Global Warming* (on Page 100 of the well-respected magazine), there is a 5% chance that the level of CO₂-equivalent gasses in our atmosphere, **expected** in just 20 years, will result in a 14.4 Degree increase in temperature and this could result in "a devastating collapse in the human population, perhaps **even to extinction.**"

From <http://www.sandiego.edu/EPIC/ghginventory/GHG-On-Road1.pdf.pdf>, we learn that in San Diego County, emissions from on-road vehicles are about 46% of regional GHG emissions. Item 4 of the Background Information of the CNRCC Resolution Supporting Fuel Tax Increase (39-6-0) March 22, 2009, says that 40% of the state's GHG emissions come from transportation. Many world leaders know that many of our citizens have taken all of the time and cost variables into account and then built their life around their automobiles. How can we expect the world to do its part to reduce GHG emissions, if they see us unwilling to reform the way we price the use of roads, so as to conform to the basic free-market principles that we claim to hold dear?

c. Other Pollution

Besides GHG emissions it is well known that on-road transportation contributes significantly (around 50% by some accounts) to our air and noise pollution. Cars cause air and water pollution directly and indirectly. This occurs when they are manufactured, when their fuel is transported and refined (refineries are, by far, the biggest cause of ground-water contamination in California), and when they are driven.

d. Urban Sprawl

The dominance of the automobile is the primary reason for our sprawling, urban land-use patterns. For example, it is well known that a simple 4-lane freeway, with frontage roads, can consume 26 acres per mile. An acre of land can only park 117 cars. Sprawl has taken valuable farm land, wet lands, and wild-life habitat. It makes it more difficult to walk or to bicycle. It also makes it more difficult to provide or to use transit.

e. Summary Statement

GHG emissions, urban sprawl and air, water, and noise pollution are made worse by making driving seem artificially inexpensive to the public. Note that for every penny earned by raising the price per mile to drive to its correct value, a penny could be cut from other taxes and fees that are unrelated to driving. Secretary of Transportation Ray LaHood's statement is shown in Section IV's Section 2 ("we can't raise the gas tax in a recession") shows that he misses this important point. This point has been made by the Sierra Club, as shown in <http://www.sierraclub.org/policy/conservation/trans.aspx>, where it says, of subsidies to driving, "These subsidies should be publicly scrutinized and eliminated by appropriate fuel and carbon taxes, parking and road user charges, . . ."

3. Section II's Condition 5, The Use of the Gasoline *Sales* Tax

As stated in Section III. 3, currently the *sales* tax on fuel must be used for the same purposes as the *excise* tax on fuel. This is contrary to the normal rule for sales taxes, whereby sales taxes are used for general-fund purposes, unrelated to the item sold. For example, the sales taxes from running shoes are not removed from the general fund to be used to build running facilities. Likewise, the sales tax on alcoholic beverages is not separated out to be used to subsidize the building of more drinking establishments. If we are going to end our unfortunate favoritism towards roads, we need to end the practice of using the sales tax from gasoline as if it were an additional fuel excise tax. This practice would be ended if the implied recommendations of this report were enacted. The sales tax on gasoline should continue, but the tax on the sale of gasoline should go to the general fund, as does the tax on the sale of other consumer items.

4. Reasons to Adopt Section II's Feature 1, a VMT Based, Road-Use Fee

From a Global Warming perspective, there is a hierarchy of favored transportation modes.

- Mode 0: Telecommuting (no need to leave the house)
- Mode 1: Walking
- Mode 2: Cycling (skate boarding and any other device-aided, non-motorized transportation mode)
- Mode 3: Transit
- Mode 4: Electric cars or cars that get great mileage
- Mode 5: Other cars

In terms of reducing pressure to expand road capacity, Modes 0, 1 and 2 are many times more desirable than even Mode 4, which is many times better than Mode 5. The point here is that as much as we want to see more electric cars and more cars that get exceptional mileage, we should not lose sight of the fact that unless all road users pay their fair share, those people using Modes 0, 1 and 2 are not being fully rewarded for not using road capacity, and this is poor environmental policy, based on the desirability factors suggested. All cars are large, manufactured devices with a finite life. They promote sprawl. People that routinely use Modes 0, 1 and 2 have often set up their lives so that they could drive less. Those life-style choices need to be fully rewarded. The statements of Sections 2a and 2d of this Section apply.

5. Reasons to Adopt Road-Use Pricing Methods Tied to *Specific* VMT

a. Need to Support Section II's Feature 6

The current fuel tax is simple and, in theory it could be raised to cover the costs of driving (for those vehicles that use fuel. Alternatively, it is easy to imagine odometers that transmit their values at scheduled times to a billing computer. With vehicle-recognition schemes, implemented

at the pump or within the billing computer containing odometer data, it would be possible to expand these simple methods to support Section II's Features 1 through 5, Feature 7, and Feature 8. However, these simple methods would not support Section II's congestion pricing Feature 6, which is sufficiently important that it must be identified and supported.

b. Value of Section II's Feature 6: Congestion Pricing

Various names have been proposed for Section II's Feature 6, including "congestion pricing" or "convenience pricing". Regardless of the name, it is a powerful way to reduce our society's propensity for expanding highways. Proponents of freeway expansion frequently mention the fact that highway "gridlock" harms our public safety because it can significantly delay emergency vehicles. Individuals in society see this in personal terms. We can all imagine a need to get home to attend to a child, or to get to an emergency room. The consequences of congestion can go well beyond being just a frustrating inconvenience. Sometimes people feel that they would pay almost anything to be able to drive at higher speeds. How many people have missed a plane, or a train, or a critical business meeting, "stuck in traffic"? Besides this, lanes also often support transit. Transit success requires dependable and reasonably fast bus travel. In addition, stop and go traffic wastes fuel, increasing global warming and unhealthy emissions.

"Convenience Lanes" could provide an option for drivers when they feel it is worth the extra money to drive beyond congestion speeds. This pricing also provides a means to keep one or more lanes operating close to their theoretical capacity, instead of at the greatly reduced flow rate that comes when demand is large. (See Section III. 4.) The pricing can adjust automatically so as to keep demand below capacity, on one or more lanes. This means that congestion in parallel lanes will clear sooner than if all lanes were allowed to stay severely congested.

"Convenience Lanes" also offer the hope of significant revenue generation, if enough people are willing to, in effect, bid up the price. (This will probably happen if the "political pushback" of Section III. 6 "trumps" the condition of "full-cost pricing" in Section III. 5, meaning that the price of driving is kept low enough in regular lanes that there are still times and places where congestion is significant.) Section II's Feature 6 would require that proceeds (collection minus collection costs) be used for transit systems that would tend to reduce the congestion. As stated in Section III. 4, the lanes and roads that are parallel to the "convenience priced" lanes can be counted on to fail to carry their capacity when serious congestion strikes. Fortunately, there is no comparable effect for transit. Although it is conceivable that transit demand could exceed transit carrying capacity, when this happens, the transit can be counted on to continue to carry its full capacity.

c. Section II's Feature 6 and Road Price Variability

Some roads are relatively expensive to build; others are relatively inexpensive. There is no reason we have to settle for charging the same per-mile price for all roads. Similarly, driving at different times should be priced differently. It is well understood that freeways are sized and expanded to facilitate peak driving times. Since it is more costly to provide the added capacity needed at peak times, it is reasonable to charge peak-time drivers more. Charging more at the times that demand is high will tend to smooth out traffic demand over various times of the day.

d. Section II's Feature 6 and Pollution

Section II's Feature 6 can reduce congestion. This is important because stop-and-go traffic probably increases pollution and GHG emissions when compared to lanes operating at "optimum speed" as identified in Section III. 4.

e. Section II's Feature 6 Supported by the CTC

These powerful arguments have evidently been recognized by the CTC. In their *Addendum to the 2007 Regional Transportation Plan Guidelines, Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process*, adopted on May 29, 2008, they provide strong support to lane pricing.

http://www.catc.ca.gov/programs/rtp/Adopted_Addendum_2007_RTP_Guidelines.pdf,

In the CTC's Pricing Strategies Section (Page 3), the CTC instructs Metropolitan Planning Organizations to "model adding pricing **to existing lanes**, not just as a means for additional expansion. **Variable/congestion pricing should be considered.**"

Variable/congestion pricing cannot be done without Section II's Feature 6 of its Condition 1.

f. Arguments to Support the CTC's Road-Pricing Guideline

Politically speaking, the Pricing Section took great courage on the part of the CTC. We should publicize the CTC guideline and defend it against critics. There is widespread confusion regarding who owns existing lanes and what promises were made. Converting existing, "free" lanes to be lanes that are priced can be justified by explaining that fuel taxes have always been road-use fees and that any stated or implied promise that paying fuel tax entitled drivers, for all time forward, to drive free on the roads that the fuel taxes may have been used to fund was specious. Specifically, the claim that drivers "already paid" for roads through the payment of fuel taxes is incorrect because (i) many drivers have just started driving; (ii) many drivers that paid fuel tax for many years have died; and (iii) paying a fee to use a public road is no different than paying rent to use property and paying rent does not lead to quasi ownership. These same arguments can be used against statements supporting the idea that drivers can forever drive free over a bridge because the tolls have paid off the loan for the bridge.

6. Reasons for Section II's Features 2 – 5

These features charge vehicles for their environmental impacts.

7. Reasons for Section II's Feature 7

The ability of low-income families to be able to drive to work and other essential family errands must be protected. However, given our challenge of global warming, this needs to be "constructive charity". The features shown in Section II suggest that a billing computer will probably be involved. If so, that computer's database can, perhaps at the individual's discretion, be supported with information such as current housing details, current salary, job location, occupation and job skills to include a full resume, childcare, location of family and friends, hobbies, or recreational pursuits, and other items that could be related to the individual's current need to drive. When the software determines that the person qualifies for a reduced multiplier of the full cost of driving (a subsidy), it could then also run various programs to offer, in creative, tailored, form letters, suggestions for changing circumstances to reduce driving. This could involve a search for jobs, a search for suitable housing, a search for daycare, and a search for better locations to pursue hobbies or recreational pursuits. The availability of transit would be considered in the software and would be offered. Job training could be suggested or offered at a discount. If circumstances support it, the person could also be asked if they would be interested in a class on riding a bicycle in traffic. Taking such a class could earn the person a financial award, perhaps to include a new or used bicycle. The software would put a high priority on helping the person achieve a lifestyle that requires less driving. As a last resort the software would take into account the congestion level of various routes and offer a driving route that requires a reduced subsidy. If no billing computer is involved, the person receiving the subsidy

might be required to send in data to support the running of these programs to reduce driving and the subsidy to driving.

8. Reasons for Section II's Feature 8

Privacy must be protected, unless confidential disclosure to law enforcement agencies is ordered by a judge based on reasonable cause. We currently rely on laws and judges to protect our privacy regarding what we say on the telephone, our emails, our internet activities, and the information we provide on our tax forms. This information could be both politically revealing and highly embarrassing, to the point where it could seriously degrade our personal and professional lives. In terms of protecting our democracy, it is especially important that our political activities be protected. Where we drive and park a car is also somewhat sensitive in this regard. However, in most cases it is less sensitive than our emails and what we say on the phone. Cell phone companies already have information about our travel. Many locations, such as Dallas, have "toll-tags" that record every time someone goes through a toll plaza and charges them accordingly. The conclusion is that the argument that many people will never accept a computer, with built in privacy protections, from having information about where we drive is overblown and not supported by the facts.

9. Reasons for Section II's Condition 2

Railroads pay property tax on the land under their tracks. Utility companies pay property taxes on the land under their transmission lines. There is no reason that large highways should not pay a property tax for the land they take off the tax rolls in each community. The favored status of roads should be eliminated.

10. California's Budget Problem

California currently has a large budget gap. Children may lose their health care and education cuts will probably be severe. State parks may close. Most state funding for transit has already been eliminated. This Section 12 strategy might help to reduce some of these cuts.

11. Raising the Fuel Tax vs. Pricing a Road-Use Fee

There are advantages in reframing the question from should we raise the fuel tax to: Should we replace the fuel tax with a road-use fee and, if so, how should we set the price of the road-use fee? Section III. 2 showed that a 2/3rds vote is needed in the state legislature to raise a tax; while, as shown in Section III. 8, only a simple majority is needed to set and then raise a user fee. Besides this, there are a lot of common misunderstandings about our fuel taxes. Many think they are a mechanism whereby drivers somehow buy new roads. This confusion was discussed in detail in this Section's Subsection 5f. If we can move the discussion to one of how to properly set the price of road use, we will have already made large gains in framing the question to the advantage of environmentalists and everyone that recognizes that it is time to stop favoring driving.

12. Technology

It is not our responsibility to pick the technologies that will ultimately be used in the implementation of the road-use pricing described in the 4 conditions of this resolution's Section II. Email and phone conversations with employees of "Skymeter", <http://www.grushhour.blogspot.com/>, indicate that they are ready to respond to a Request For Proposal (RFP) to implement VMT pricing in the Netherlands, to include every road in the country. Their proposal will be that each car will have a GPS unit, about as large as an eye-glasses case, sitting on the dash. It will contain a database of roads and a variable set of pricing

coefficients. The GPS software will determine the car's location with sufficient accuracy so as to support software computing a running tabulation of charges, as the car is driven. They state that the final challenge was to design the software so that the unit would function when the car was being driven in the presence of GPS reflections, such as in city "canyons" which is to say around multiple large buildings. They have solved this problem with additional algorithms and have demonstrated this in the most severe conditions they could find. However, they don't want to have to distinguish between lanes, suggesting that congestion pricing on large multi-lane roads, where pricing varies between parallel lanes, may require a Radio Frequency Identification (RFID) overlay pricing scheme, such as is currently used for "toll tags."

There are probably several, perhaps even many, ways to accomplish road-use pricing that has the features described in this Section.

1.7.4.2.3 Cost-Effective Mitigation to Increase Bicycle Use

Reference 6 also suggested that the Climate Action Plan include the following new section, "Section 13", to implement a cost-effective mitigation to reduce driving by increasing bicycle use:

13 - Education and Projects to Support Bicycle Transportation

For many reasons, including the climate crisis and the "AMRP" principle stated in the Introduction of this RES, the elements of this section need to be adopted, even if the computer model of the SCS shows that our CARP target reductions are going to be met without these measures. The criteria for spending money for bicycle transportation should be to maximize the resulting estimated reductions in driving. The following strategies will probably do this.

Projects

Each of the smart growth place types, both existing and planned, shown in Figure 2 of Section 9, should be checked to see if bicycle access could be substantially improved with either a traffic calming project, a "complete streets" project, more shoulder width, or a project to overcome some natural or made-made obstacle. These projects should be prioritized using a cost/benefit ratio metric. It is hereby assumed that 40% of the \$270M available for the Regional Bicycle Plan should be used to fund the projects. They should be selected for implementation, from top of the list (lowest cost/benefit ratio) down, until the money (about \$110M) is used up. An example of one of these projects, for the proposed town center near the corner of I-5 and SR-78, is described in the "Existing Planning Efforts" of Section 9.

Education

The remaining 60% of the \$270M, about \$160M, should be used to

- 1.) teach interested adults about bicycle accident statistics (most serious injuries occur to cyclists in accidents that do not involve a motor vehicle), car-bike accident statistics (most are caused by wrong-way riding and errors in intersections; clear cut hit-from-behind is rare), and how to ride in all conditions, to minimize problems.
- 2.) teach riding-in-traffic skills and how to ride in other challenging conditions, by having the class members and instructor go out into real conditions and ride together, until proficiency is achieved.

Students that pass a rigorous written test and demonstrate proficiency in traffic and other challenging conditions are paid for their time and effort.

These classes should be based on the curriculum developed by the League of American Bicyclists and taught by instructors certified by the League.

Assuming a class size of 3 riders per instructor and that each rider passes both tests and earns \$100 and that the instructor, with overhead, costs \$500 dollars, for a total of \$800 for each 3 students, means that the \$160M could educate $\$160\text{M}/\$800 = 200,000$ classes of 3 students, for a total of 600,000 students. This is about 20% of the population of San Diego County.

The conclusion here is that SANDAG has had feasible mitigations described in Reference 6 but has not chosen to consider them in this DEIR.

1.7.4.3 One-Hour Presentation of Reference 4

Reference 4 is a peer reviewed and published report that I coauthored with Dr. Jim Stewart. Dr. Stewart has a PhD in Nuclear Physics, a Master's degree in Urban Planning, and co-chairs Sierra Club California's Energy-Climate Committee. The paper was peer-reviewed and published by the Air and Waste Management Association. I presented the paper at their 103rd Conference and Convention on June 22, 2010, in their Sustainable Land Use and Transportation Session.

On January 7, 2011, I gave a 1-hour presentation on the paper to SANDAG's Mr. Muggs Stoll and Carolina Gregor. Mr. Stoll is SANDAG's Director of Land Use and Planning. Ms. Gregor is a SANDAG Regional Planner. On January 6th, to prepare for the meeting, I sent Reference 4 and three related files to Mr. Stoll and Regional Planners Colleen Clemenston and Carolina Gregor.

1.7.4.4 Conclusion

It is hard to understand why SANDAG did not realize that reallocating TransNet money from highways to transit, unbundling the cost of parking and driving, and good bicycle strategies are good, feasible, and necessary mitigations, given the harsh requirements of our climate crisis.

1.8 The DEIR presents weak, poorly-worded, straw-man versions of mitigations that were presented by the public and then, through poor logic, finds them infeasible.

There are at least two places where the mitigations offered by the public have been misrepresented and then described as "infeasible", in the DEIR.

1.8.1 "Elevating Parking Fees" Mitigation

On Page 4.16-34 of the DEIR, a mitigation measure is described as a requirement to "elevate parking fees". Using faulty logic, which ignores all of the information that has been given to SANDAG in References 4, 6 and countless speeches to the SANDAG Board; it is argued that it is infeasible, as follows.

- Require SANDAG's member agencies to increase congestion pricing by elevating parking fees. The increased parking fees would serve as an economic deterrent for commuters driving alone. This could reduce single-driver trips and help avoid substantial increases in work trip travel time and peak period congestion.

This measure was considered infeasible due to the social considerations, that is, the inability to implement this measure adequately and equally throughout all agencies and because of economic consideration of the added economic burden that would be placed on workers in the San Diego region, in addition to the already difficult economic situation. Also, this measure would not achieve the objective to provide a transportation system that offers convenient travel options for people and goods, as well as reasonable travel costs as the increased parking fee may adversely impact the travel costs of drivers who do not have access to convenient transit options.

1.8.1.1 Problem with Using the Words "Elevated Parking Fee"

It may have happened, but I have never heard any member of the public ask for anything like "elevated parking fees" without explaining that the money collected would need to go back to those for whom the

parking is built, or in other words, to those that are losing money because of the “free” or underpriced parking. If anyone ever had such an idea, it was poorly thought out. SANDAG has been exposed to the correct idea, that parking costs should be unbundled, for at least several years now, as shown, for example, in References 4 and 6, as well as Section 1.7 above. The word “unbundled” is the correct word because the high cost of parking is always being paid, whether it is visible and discretionary or if it is hidden and forced on people. As it has been stated repeatedly to SANDAG, parking is expensive to provide. When it is “free” or underpriced, its cost reduces people’s wages, increases people’s rent, increases peoples net cost for a round trip on a train, and raises the cost of all goods and services, even food. This is true, whether a person uses the parking or not. Therefore this status quo method is unjust because it takes money from those that drive less than average and gives it to those that drive more than average.

1.8.1.2 Problem with Using the Words “Congestion Pricing”

The cost of parking should be unbundled in all locations. Parking provided at no charge is the worst case of bundled parking cost and, as such, it is the case that needs to be fixed first, not last. Usually, where parking is “free”, there is plenty of vacancy and so no “congestion pricing” is needed. Reference 4 is the first report in the world to include real-time congestion pricing algorithms. These algorithms would be used any time occupancy moves above 70%, for cases where 85% occupancy might be exceeded. SANDAG should now know all that is needed about how to unbundle the cost in all cases. The words “congestion pricing” shields the suburbs, including the offices in industrial parks, exactly where unbundling is needed the most.

1.8.1.3 Inequity of an Apartment Complex with “Free Parking”

For example, consider a case where the actual cost of providing parking at an apartment complex is \$25 per month per space and the average family own 2 cars. If nothing is charged for parking, a family that owns 4 cars has no problem, as long as their neighbor happens to be a family that does not own a car. However, if the parking is worth \$25 a month, the family with no cars is getting cheated out of \$50 a month. This could be a serious matter if that family’s income is incapable of feeding all its members near the end of its pay period.

Please note that the system which seems like the obvious answer to the above example, where tenants are given a choice to rent any number of parking spaces, including zero, is suboptimal because it does not allow day-to-day flexibility and it does not allow for the full sharing of parking. “Full sharing” means that anyone can make use of the parking, if they are willing to pay the fair price. If this sounds like it won’t work, please read Reference 4, a published and peer-reviewed document.

1.8.1.4 Implementation of Unbundled Parking Cost Is Not that Difficult

Regarding the DEIR’s claim that there is an “inability to implement this measure adequately and equally throughout all agencies”, that is not true. SANDAG could adopt a rule that any city that continues to allow bundled parking cost will not get any money for road maintenance. At the same time that SANDAG takes this position of demanding basic economic fairness, it could petition the State of California to pass laws disallowing parking practices that transfer wealth from those that drive less than average to those that drive more than average. In other words, SANDAG could petition the State of California to make bundled parking costs illegal. This is reasonable, because all levels of government have a responsibility to enforce basic economic fairness. The technology to do this “efficiently and conveniently” is described in Reference 4.

1.8.1.5 The “Added Economic Burden” is a One-Sided View

Regarding the DEIR’s claim that there is an “added economic burden”, the following example will prove that, on average, this burden is small and well worth the benefit of increased fairness. With good technology, the cost

of collection can be kept small. On Page 3 of Reference 7, an example is given that is very generous to the technology provider. (This expense is only needed because the technology is not yet “off the self”.) However, in just 10 years, the cost of collection and redistribution has dropped to just 2%. The real economic burden is the high cost of providing the high numbers of parking spaces which are needed if the cost is bundled. In many cases, if the cost of parking were to be unbundled, less parking could be provided, reducing costs for everyone. Note the second paragraph under the “Advocacy” heading, on Page 3 of Reference 7. It shows that if the community college decided to end the economic discrimination against students and employees that drive less than average, it could yield additional land worth \$20 million. The loss of this land to parking is an “added economic burden” that SANDAG seems to not recognize in the DEIR.

It may be that the SANDAG authors have simply not thought this through. The “economic burden” has to be considered in light of the earnings that many of the stakeholders will get.

1.8.1.6 Concern for Drivers without Convenient Transit Options

Similarly, regarding the DEIR’s words, “the increased parking fee may adversely impact the travel costs of drivers who do not have access to convenient transit options”, the following information is provided.

Some locations have good transit and some locations have poor transit. It is common to think that unbundling the cost of parking where it is difficult to not drive, would have a poor outcome. That is not true, as can be seen by the following example.

Let’s consider a factory with 100 employees, that has no transit service, is located just outside of Palm Springs, during a month where temperatures are over 100 degrees. Before unbundling the cost, let’s assume that there are no employees that car pool and only 1 employee that bicycles to work. Let’s also assume that, based on the value of land and the cost of money, the value of the parking is \$5 per day. For simplicity, let’s also assume zero cost for implementation and that all employees work exactly the same amount of hours, every single work day. Finally let’s assume that after unbundling the cost of the parking, due to the high temperatures, there is still just the single bicycle commuter.

Given these assumptions, the 99 employees that drive each pay \$5 each day. Therefore, instead of generating \$500 per day, the parking charge would only generate \$495 per day, because the bicyclist pays nothing. Since all the employees work the same hours, they all get \$4.95 per day. It therefore seems that SANDAG is worried about all the driving employees losing five cents per day. SANDAG forgets that the bicyclist is getting \$4.95 per day, which some would say she deserves, for riding in the 100 degree weather. The employees would know that they are losing the five cents per day because the lone cyclist is not driving. Given, this situation, it is easy enough to imagine that one other person would take up cycling to work. If so, all the employees would get \$4.90 per day, and that includes the two cyclists, that are not paying the \$5 per day. Now, less assume one more thing. Let’s say this situation is so stable that the company president steps in and finds two people in Palm Springs who want to park an RV or a boat on these two extra spaces, at a charge of \$5 per work day, but free on the week end. In this case, no driver loses any money and the two cyclists earn an extra \$5 per day. Under these assumptions, the SANDAG concern for the drivers is seen to be false. Besides this, the number of non-drivers doubled, which is an impressive outcome from an environmental standpoint.

Another case could be considered where transit is very good and a large percentage of employees get to work without driving. This outcome would be very different but would still be fair to all. In this case, it would be reasonable for a company to step in and help a low income worker who has made a poor choice of where to live and must drive to a location where many can use transit. In such a case, the worker I have described will be considerably worse off if parking costs are unbundled. However, the financial help to the low-income worker should not be permanent. We all need to realize that not all bad decisions can be covered by special actions on the part of companies or governments.

The SANDAG preparers of this document seem strangely oblivious to these facts. Finally, destabilizing the climate should also be a SANDAG concern, at least as legitimate as the DEIR's concern that an "increased parking fee may adversely impact the travel costs of drivers".

1.8.2 "Increased Tax on Transportation Fuel" Mitigation

It is never advisable or accurate to talk about a "tax on transportation fuel". The excise tax on fuel should be viewed as a very poorly understood and a very poorly priced road-use fee. Calling it a road-use fee and talking about setting the road-use fee at a level which is fair to all citizens will help to foster a rational discussion. SANDAG's choice of words is exactly what the oil companies would like. Few people like to see any type of tax raised.

On Page 4.16-34 the following mitigation is given, and then it is argued that it is infeasible, as follows.

- Impose increased taxes on transportation fuel as an economic deterrent to auto and truck travel. This could reduce single-driver trips and avoid substantial increases in work trip travel time and peak period congestion.

This measure was considered infeasible because of the inability of SANDAG to adequately require the implementation of this measure across the region with the necessary authority to impose such taxes. In addition, this measure would not achieve the objective to provide a transportation system that offers convenient travel options for people and goods, as well as reasonable travel costs as increased transportation fuel taxes would elevate costs associated with travel, including transit. Also, the measure would not achieve the objective to provide a transportation system that supports improvement of the region's standard of living due to the adverse impact it would have on the economic prosperity and viability of the region as a center for regional distribution and the goods movement industry due to higher transportation fuel prices.

1.8.2.1 General Comments on the Logic

This logic is reminiscent of John McCain and Hillary Clinton calling for an end to gas taxes, as they did during the Indiana primary in the 2008 election. Although big oil and the highway lobby were certainly thrilled by this suggested policy, the voters of Indiana were not impressed and President Obama, who told the truth about the issue, did well in Indiana.

Section 1.7.4.2.2 shows that this DEIR is both illogical and biased in its attempt to show that this mitigation is infeasible.

1.8.2.2 The Feasibility of a Local Implementation

The discussion in Section 1.7.4.2.2 includes the following words:

These powerful arguments have evidently been recognized by the CTC. In their *Addendum to the 2007 Regional Transportation Plan Guidelines, Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process*, adopted on May 29, 2008, they provide strong support to lane pricing.

http://www.catc.ca.gov/programs/rtp/Adopted_Addendum_2007_RTP_Guidelines.pdf,

In the CTC's Pricing Strategies Section (Page 3), the CTC instructs Metropolitan Planning Organizations to "model adding pricing **to existing lanes**, not just as a means for additional expansion. **Variable/congestion pricing should be considered.**"

Therefore, if California refuses to realize that the gas tax has no future and that therefore a road-use fee is needed, SANDAG will have no choice but to follow its CTC guidelines and approve the pricing of our controlled-access roads ("freeways"), using cameras at all exits and entrances and automated billing. I-5 and I-15 could be done first. The original price to charge would be 2 cents per mile. This approach is described in an as-yet unpublished opinion piece, coauthored by myself and the former Mayor of Palo

Alto and co Founder of “Friends of Caltrain”. Here is the opinion piece, which we hope to eventually get published in the San Jose Mercury News.

Use Free Market Principles to Save Caltrain Reduce Congestion, and Help Stabilize Our Climate

Just this week, the regional transportation agencies put their heads together in response to the outpouring of public support for Caltrain and came up with a rescue package that will save a substantial part of the service. The Caltrain board sent staff back to come up with another \$3.3 million so we can retain the current schedule with the successful Baby Bullets. The latest ridership numbers show Caltrain is more popular than ever, even with the recent fare increases and some service reductions. It is a successful and efficient transit system: the problem is it lacks a dedicated funding base to complement the 47% that comes from the riders.

The rescue package will buy time for one year; hopefully two. We must create a dedicated, long-term funding source for Caltrain. There are many ideas which are beginning to emerge. One is an increase in our regional sales tax. A second is a regional increase in the gas tax. Either would require a two-thirds vote. This is a pitch for another idea that both free market advocates and environmentalists should be able to support.

The Chairman of the California Transportation Commission has written that our current gas tax contributes nothing towards building roads and *only pays half the cost of maintenance*. Maintaining roads therefore requires using money generated by income, sales, and property tax; leaving less general tax money for such things as schools, libraries, and public safety.

The gas tax has a poor long-term future. Cars and light-duty trucks emit about 40% of the Bay Area’s greenhouse gas emissions. Since, under state law, we must continue to improve the efficiency of our state’s fleet of cars, our gas-tax revenue will decline, over time. President Obama’s Republican Secretary of Transportation Ray La Hood has stated that we must implement what he called a “VMT” (vehicle-miles-travelled) fee. Considering how fast we can increase the efficiency of our fleet of California cars and how fast we must reduce GHG emissions, *we must also drive less*, even as our population increases. If roads were operated according to free-market principles, we would drive less.

Both Sierra Club California and the Environmental Caucus of the California Democratic Party have passed resolutions supporting a “comprehensive road-use fee pricing system”. Besides being priced to cover all costs, such a system would need to also incentivize energy-efficient cars, at least as much as our current gas tax; protect low-income drivers; and protect privacy.

If we assume that we collect 50 cents per gallon in gas tax and that the average car gets 25 miles per gallon, then, on average, we are charging about 2 cents per mile. Using our Transportation Commission Chairman’s statement, we conclude that this only covers half of the maintenance cost and that therefore we should be charging at least 4 cents per mile. If we were to charge an additional 2 cents per mile, it would be reasonable to use the additional money for a general-fund purpose, since general funds are being used to maintain the roads.

There is promising road-use fee technology. *Skymeter*, a Canadian company, has a system that is based on GPS technology. According to the company, it could accumulate only net charge, if that is the wish of the car owner, to protect privacy; and could easily charge all cars on all roads, in California.

We can customize road-use fees to our local needs. Perhaps we would prefer to not charge all drivers on all roads, to reduce 101/280 congestion and fund Caltrain. Using the technology that transmits license plate numbers of cars running red lights, it would be easy to bill drivers, per

mile, on any controlled-access road. Since Caltrain parallels 101 and 280, it is best to set up a system to charge drivers that use just these two roads, over a length that is within the main segment of Caltrain. These are the drivers that benefit the most from Caltrain.

It can be shown that 35 miles of 16 lanes, with an average flow rate of 300 cars per hour, being charged 2 cents per mile, would generate the necessary 30 million dollars per year. For 600 cars per hour, 60 million dollars per year would be earned. A 30-mile trip would cost one car (with any number of passengers) sixty cents. Congestion pricing could be added, if desired, to reduce congestion during peak hours. The earnings above thirty million dollars per year could be used to help redesign and electrify Caltrain, for quiet, safe “24/7” service that could serve more stations.

The blow up in the Gulf and the melt down in Japan tell us that we should stop subsidizing energy use. Considering global warming, our grandchildren will thank us. Let’s start to operate our roads as a business and let’s save and improve Caltrain.

Go to FriendsOfCaltrain.com for the latest updates on how to save Caltrain. Caltrain provides an essential and cost-effective, time-competitive service. Let’s work together to Save our Caltrain for the long term!

Yoriko Kishimoto, Former Mayor of Palo Alto and co-founder of Friends of Caltrain
Mike Bullock, long time transportation advocate

All of the \$30 to \$60 million dollars per year that this would raise should be given back to all tax payers in proportion to the state, general taxes they pay, since they are the ones making up the difference between the gas tax paid and the total road maintenance cost needed. If congestion pricing is needed to eliminate congestion, the extra earnings could be used to increase transit service or electrify our trains.

If SANDAG moved toward implementation, it is highly likely that the state would be embarrassed into action.

1.9 The DEIR presents an inadequate set of alternative.

1.9.1 An obvious Alternative That Should Have Been Considered

The mitigations described above, in Sections 1.7 and 1.8, are feasible and powerful. Although they have been described to SANDAG for years, by members of the public, none of them appear in this DEIR, except for the two that were described in a distorted form, as shown in Sections 1.8.1 and 1.8.2. These overlooked mitigations would be so effective that they would obviate the need for any highway expansion, which is perhaps the reason they were overlooked. These mitigations, taken together, would be the alternative that would need to be selected. Such an alternative would meet the primary demands of the RTP. It would eliminate congestion and support business. It would support business by using free-market principles (except for transit and bicycling), lowering taxes, and reducing the amount of parking needed. It gives our youth and unborn hope for the future. It would provide the environmental justice we need. It would create healthy environments for our neighborhoods.

It could be called the “Equitable Alternative”, because it is inequitable to use a sales tax to increase driving by making it artificially cheap to drive; it is inequitable to have the cost of parking and operating roads bundled; it is inequitable to assume adults can bicycle in traffic since they have not been given the information they need; it is inequitable to have bicyclists have to ride significant distances out of their way because our freeways cut off bike routes on surface streets, such as the way I-5 blocks Vista Way, in Oceanside; and finally, it is inequitable to destabilize our planet’s climate. The features of this Equitable Alternative would be

- Reallocating TransNet money for building new lanes on our freeways to instead be used for transit

- Unbundling the cost of parking and operating roads
- Using funds for “Smart Growth” and bicycle transportation in ways that maximize the driving reduction achieved for each dollar spent.

The following comes from CEQA Guidelines. The specific requirements that are being violated by the DEIR because it ignored the public’s powerful mitigations, that amount to an alternative, are put in *italics and bold*.

Section 15126.6 Consideration and Discussion of Alternatives to the Proposed Project

(a) Alternatives to the Proposed Project. ***An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation.*** An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. ***There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason.*** (Citizens of Goleta Valley v. Board of Supervisors(1990) 52 Cal.3d 553 and Laurel Heights Improvement Association v. Regents of the University of California(1988) 47 Cal.3d 376).

(b) Purpose. ***Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.***

(c) Selection of a range of reasonable alternatives. ***The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects.*** The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Additional information explaining the choice of alternatives may be included in the administrative record. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.

2.0 Computing the 2035 Target Needed to Support S-3-05

2.1 Introduction

Since S-3-05 is the closest thing we have to a road map to human survival, SANDAG has, and has had for a long time, an obvious need to compute the driving reductions needed in 2035, to at least meet the S-3-05 GHG reduction trajectory.

Unfortunately, CARB gave you (SANDAG) the Year 2035 reduction that you (SANDAG) requested, which is only a 13% reduction, for year 2035.

These reductions are per capita, with respect to *driving* in 2005. This can be understood by carefully considering the following two items:

- 1.) Page 8, of http://arb.ca.gov/cc/sb375/staffreport_sb375080910.pdf, which says, “The RTAC recommended that targets be expressed as a percent reduction in per-capita greenhouse gas emissions from a 2005 base year”; and
- 2.) The first footnote in the table of CARB calculations, <http://arb.ca.gov/cc/sb375/mpo.co2.reduction.calc.pdf>, which says: “The CO2 emissions presented in this table do not include reductions from Pavley (better mileage for the California fleet of cars and light duty trucks” and LCFS (low carbon fuel standards) regulations.”

Since no reductions are counted from Pavley and the LCFS regulations, reducing driving is the only way SANDAG can reduce GHG by its RTP/SCS. “Greenhouse gas (GHG)” emissions are used as equivalent to the more accurate “CO2 emissions.” In the second item, “Pavley” (named after Senator Fran Pavley) refers to a lowered average CO2 per mile driven. Also in the second item, “LCFS” refers to the “Low Carbon Fuel Standard”. Both “Pavley” and the “LCFS” reduce the emissions per mile driven. Since these reductions are not being counted, the reductions shown come only from per capita, percent reductions in driving, or “vehicle miles travelled”, VMT. Therefore the so-called GHG reductions are really VMT reductions.

2.2 Overview of Relationships and Derivation of Key Formula

The S-3-05 net reduction in GHG emissions, from cars and light-duty trucks, expressed as a fraction of 2005 emissions, is obtained by multiplying four factors together. The definitions of Table 1 apply.

Table 1 Factor Definitions, with Respect to Year 2005

| Factor Definitions | |
|---|--|
| <i>All are for for the year of interest, with respect to year 2005 values. Except for Population, all are for cars and light-duty trucks.</i> | |
| f | net factor of the emissions of Greenhouse Gas |
| f_Pavley | factor of the average statewide mileage |
| f_Fuel | factor of the reduction of GHG due to fuels that burn less carbon |
| f_Population | factor of the population in the region of interest |
| f_PerCapitaVMT | factor of per capita driving |

The following equations apply.

$$\text{Eq. 1} \quad f = F_{\text{Pavley}} \times f_{\text{Fuel}} \times f_{\text{Population}} \times f_{\text{PerCapitaVMT}}$$

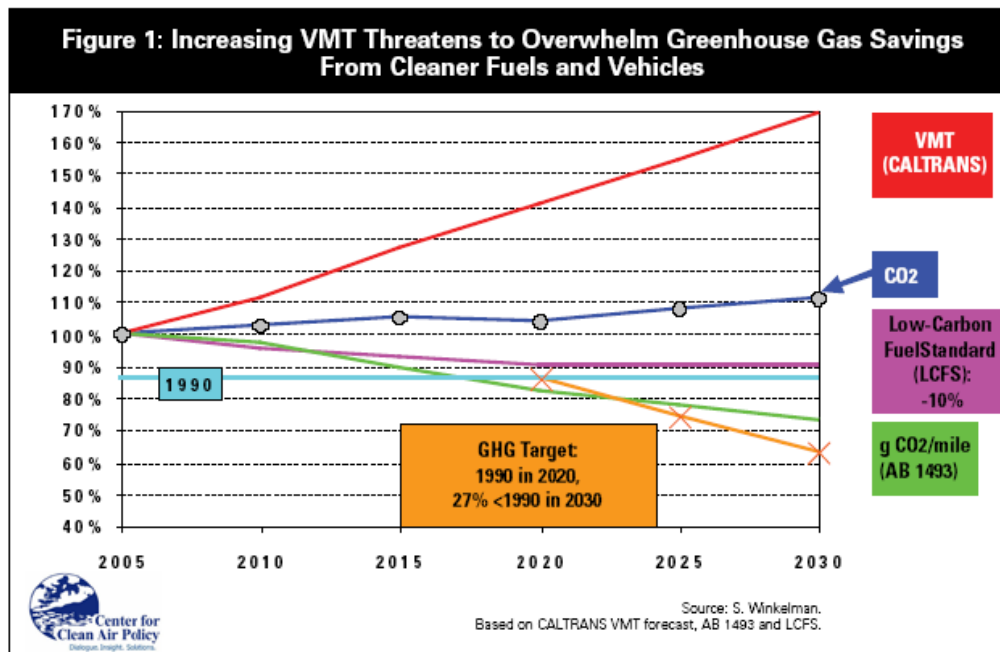
Eq. 2 is derived from Eq. 1.

$$\text{Eq. 2} \quad f_{\text{PerCapitaVMT}} = f / (F_{\text{Pavley}} \times f_{\text{Fuel}} \times f_{\text{Population}})$$

2.3 Getting the Values to Use in the Equation

Figure 5 is from <http://www.nrdc.org/globalWarming/sb375/files/sb375.pdf>, a widely-respected report on SB-375. Note that all of its values are in the units of factors (same as fraction) of their values in year 2005. Figure 5 will supply all of the needed values, except for the factor of population. (Neither the red line nor the blue line are used.) Its gold line is the S-3-05 trajectory that CARB ignored when it issued the driving reduction values for year 2035.

Figure 5 GHG Reductions from Pavley (AB 1493, in Green); the Low Carbon Fuel Standard (in Purple); the Predicted Driving (VMT, in Red); the Net Result of GHG (CO2, in Blue); and & the S-3-05 Trajectory (in Gold)



2.3.1 Getting the Net Factor of the Emissions of Greenhouse Gas in 2035, with Respect to 2005 Values

To get the net factor of the emissions of GHG, for year 2035, and with respect to year 2005, it is necessary to extrapolate the Governor’s Executive Order target values (the gold line of Figure 5), out to year 2035. The gold line shows that this factor is 0.87 in 2020 and is 0.64 in 2030. Therefore, in year 2035, the factor will be

$$0.64 + [(0.64 - .87) / (2030-2020)] * (2035-2030) = 0.525$$

2.3.2 Getting the Factor of the Average Statewide Mileage in 2035, with Respect to the 2005 Value

To get the Pavley reduction factor, for Year 2035, it is necessary to extrapolate the average statewide mileage factor data, which is Figure 5’s green line, out to Year 2035. It is 0.82 in 2020 and it is 0.73 in 2030. Therefore, in year 2035 the statewide mileage factor data will be

$$0.73 + [(0.73 - .82) / (2030-2020)] * (2035-2030) = 0.685$$

Pavley 1 ends in Year 2017. It is widely assumed that it will be replaced by what is often called “Pavley 2”. The extrapolation computed here is based on the assumption made by the author of Figure 5, as

shown in the slope of the green line from year 2020 to 2030. Based on the authoritative credentials of the authors of Figure 1, this is the best assumption that can be made. Assuming that the California fleet will continually get more efficient, in terms of CO2 per mile driven, relies on an assumption that a significant fraction of our car owners will be able to purchase newer-model cars.

2.3.3 Getting the Factor of the Reduction of GHG Due to Fuels that Burn less Carbon

Looking at the purple line of Figure 5, it is clear that this factor will be 0.9 in 2035.

2.3.4 Getting the Factor of the Increase in Population

The factor for population in San Diego County is computed using the populations estimated in CARB’s <http://arb.ca.gov/cc/sb375/mpo.co2.reduction.calc.pdf>, namely 3,034,388 people in 2005 and 3,984,753 people in 2035. So the factor, from 2005 to 2035 is $3,984,753/3,034,388 = 1.313$.

2.4 Computing the Required Driving Reduction, for 2035

The 4 values, computed in Section 2.3 above, are used in Eq. 2, to compute the required factor.

$$\text{Eq. 2 } f_{\text{PerCapitaVMT}} = .525 / (.685 \times 0.9 \times 1.313)$$

Therefore, $f_{\text{PerCapitaVMT}} = .649$.

This corresponds to a 35.1% reduction in per-capita driving, in year 2035.

3.0 Computing the Amount of Driving, in 2035, Compared to 2005, to See if There is any Reason to Add Highway Capacity

3.1 Formula to use

The factor of driving in 2035, compared to 2005, is the product of the factor of driving (.649, as computed in Section 2.0) and the factor of population change (1.313 as computed in Paragraph 2.3.5).

Multiplying these two factors together (factor of driving per population multiplied by the factor of the increase in population) gives a factor as follows:

Factor of driving in 2035 compared to 2005:

$$= .649 \times 1.313 = .8515.$$

3.2 Significance of Result

This means that even though our population will grow by 31.3% we still must all collectively drive nearly 15% less than we did in 2005. This is a profound piece of information. It means that there is no reason whatsoever to expand roads. This is good news because it means we can confidently reallocate TransNet money away from highway expansion and into meeting our need to upgrade transit. It also means it is time to step away from “Business As Usual” and adopt the “Equitable Alternative”.

4.0 An Alternative (The “Equitable Alternative”) with Estimated Driving Reductions

4.1 Introduction

Since Reference 3 makes it clear that S-3-05 is insufficient to provide an acceptable safety margin from Dangerous Anthropogenic Interference (DAI), the 35% computed in Section 2.0 above is expanded to 45%, by 2035. This might be large enough to be legal, under CEQA.

This section will debunk SANDAG's claim, made to CARB, that your RTP is "aggressive" (as in "aggressive but achievable"). Significant reductions in driving can be achieved, as this section will show.

One strategy that the MPOs are trying to implement is enacting zoning changes to reduce sprawl. These changes typically increase densities and allow mixed use, especially around transit stations. These changes are said to support "smart growth". As stated above, SANDAG Directors have repeatedly been asked to define "smart growth" to be "VMT-reducing" growth, so that smart growth strategies and estimated outcomes could be quantified. These requests have been ignored. Therefore, SANDAG has done a poor job of creating their "Smart Growth Incentive Plan" and their "Smart Growth Design Guideline". These documents had great potential. However, SANDAG preferred to keep the definition of "smart growth" vague, using such phrases as "pedestrian and bicycle friendly" so that decisions on spending money could remain arbitrary. Even so, the concept of improving zoning to reduce driving is sound. Over time and to the extent the economy supports growth, this will yield driving reductions. However, building smart growth requires a significant investment. Unless the economy improves dramatically, this strategy will produce VMT reductions that are too little and too late.

The MPOs need to identify all of the significant root causes of the car-oriented California lifestyle, besides just the urban sprawl that can only be partially mitigated by zoning specific and unique areas for smarter development. Several of these root causes are a direct result of government policies that create fundamental unfairness to those that drive less than average. MPOs need to fully develop strategies that eliminate these causes. These strategies would best be accomplished with both CARB and state legislative help.

The primary root causes are the poor methods used to get the public to pay for roads and parking. Fundamental changes in parking policy and road-use pricing, which are both related to the issue of congestion and freeway expansion, are never discussed in any depth at SANDAG. This oversight is reducing the chances of getting strategies that will bring down rates of driving on the scale that is needed. Such strategies would allow California to live up to its global warming responsibility and to do this in a way that is equitable to all.

4.2 Road Use Fee Pricing Systems

A San Diego County newspaper, the North County Times (NCT), in a February 9, 2009 article, reported that the Chair of the California Transportation Commission (CTC) wrote that the gas tax currently contributes nothing to road construction **and only provides half of the money needed annually for repairs:**

<http://www.nctimes.com/articles/2009/02/09/news/columnists/downey/z8591536f3e7332da882575510076fa1e.txt>.

A Canadian company, *Skymeter*, is designing and installing a variable and comprehensive road-use fee pricing system, in the Netherlands by 2014 and in Denmark by 2016. The charge per mile will vary by such things as model of car, road, time of day, and congestion level. In 2005, the gas tax in the Netherlands was equivalent to \$3.50 per gallon. However, with the advent of the new system, the Netherlands will eliminate the gas tax. The Netherlands estimates that the GHG from driving will drop by 10%, with the new system. Note that such a system could easily charge a price of zero cents per mile for a low-income driver. Our current system of a gas tax has no such capability. *Skymeter* will program the navigational-unit-like GPS boxes so that no travel information is stored, to protect driver privacy.

On July 11th 2009, the California Nevada Regional Conservation Committee (CNRCC) of the Sierra Club California passed a resolution supporting a "Comprehensive Road Use Fee Pricing System".

The CNRCC resolution is supported by a 10-Page “Reference Document” that describes the defining characteristics of a road-use fee pricing system that would conform to Sierra Club principles. It has an example of a road-use fee structure that has these characteristics. Useful background information is also provided. This paper can be provided upon request.

On November 14th, the Environmental Caucus of the California Democratic Party (CDP) passed a 1-page resolution in support of a “Comprehensive Road-Use Fee Pricing System”. This one-page resolution contains the following words.

THEREFORE, BE IT RESOLVED, that the California Democratic Party* supports a state-funded study of a design of a road-use fee pricing system that (1) would pay for all road-use costs including the environmental and health costs caused by driving, (2) could still include a fuel tax or fee, (3) would mitigate impacts on low-income users and protect privacy, (4) would include congestion pricing when that technology becomes feasible, (5) would keep the per-mile price incentive to drive energy-efficient cars at least as large as it is with today’s fuel excise tax, and (6) could be accompanied by tax reductions sized to achieve either net-revenue neutrality or near-net-revenue neutrality.

***Not true because the resolution failed in the CDP Resolution Committee**

The Nevada Department of Transportation is taking comments on a proposal for a VMT fee to replace their gas tax, as shown at <http://www.vmtfeenv.com/>. Oregon has done a proof of concept of a decentralized VMT system.

The 2010 Platform of the California Democratic Party (at http://www.cadem.org/atf/cf/%7BBF9D7366-E5A7-41C3-8E3F-E06FB835FCCE%7D/Platform2010CDP_FINAL_June.pdf) has words that were in part inspired by the 1-page resolution identified above. These words are the following bullet:

- Work for equitable and environmentally-sound road and parking use

Using sales taxes, property taxes, income taxes, and other general taxes to pay for road expansion and operation makes it artificially cheap to drive. This is unjust to citizens that drive less than average. It also encourages driving. There is no reason why government should adopt policies that increase driving and economically discriminate against those that telecommute, walk, bike, car pool, or use transit. The unconstitutionality of the current system is plain to see since roads are built and maintained by the government. The government must be fair to citizens unless there is a significant reason to be unfair. Forcing people with no children to pay for education is justifiable because we will all suffer if we have a poor public education system. However, driving a car is not behavior that justifies government subsidy. Getting an education deserves subsidy; driving does not.

Considering all of this information, SANDAG has a responsibility to notify the Governor and our legislative leaders that our state has good reasons to implement a comprehensive and variable road-use fee pricing system. There is probably no reason to “reinvent the wheel”. The *Skymeter* system would work here in California. The Sierra Club California analysis can be considered to ensure an implementation that is both equitable to all and environmentally sound.

This strategy, by itself, would probably decrease driving throughout California by between 20% and 25%.

4.3 Unbundling the Cost of Car Parking

For the vast majority of destinations in California, the cost of car parking is hidden within other costs. This has serious consequences. For example, at most places of employment, parking costs reduce the wages that can be paid to all the employees, even those that never use the parking. Similarly, at most apartment complexes, bundled parking costs increase the rent and this is true, even for families that do

not own a car. Bundled parking costs routinely increase the costs of goods, such as groceries, for all customers. Again, this is even true for those that do not drive. Since governments require businesses to provide minimum levels of parking, they are involved in this economic discrimination towards those that drive less.

Driving less is, to some degree, a lifestyle choice. Since government has no valid reason to encourage driving, the lifestyle choice of less driving deserves constitutional, or at least legal, protection from any practices that discriminate against it, economically. So far, this agency (SANDAG) has not taken an active role in educating the people of San Diego County on how parking policy effects economic fairness or how parking policies that were more fair could reduce driving.

On June 22nd 2010, I presented a paper that I coauthored, on how parking could be operated to unbundle parking costs in a way that supports the sharing of parking. This was at the 101st Conference and Exhibit of the Air and Waste Management Association, in Calgary, Canada. The session, *Sustainable Land Use and Transportation*, included my paper, *A Plan to Efficiently and Conveniently Unbundle Car Parking Costs*. The paper was extremely well received.

My paper is therefore both peer reviewed and published. I would be pleased to present this paper to the staff of SANDAG, in the hopes that SANDAG could help to bring about equitable and environmentally-sound parking policies to California. It should be incorporated into your next Regional Comprehensive Plan, for example.

The following points, taken from the paper, apply.

- Vehicle miles traveled (VMT) are a major cause of global warming and pollution.
- California's Metropolitan Planning Organizations (MPOs) need to adopt strategies that reduce vehicle miles traveled (VMT), in order to at least meet the S-3-05 trajectory, for years 2020 and 2035.
- The appropriate pricing of parking is one of the least costly tools documented to reduce VMT.
- New technologies, such as sensors feeding computer-generated billing, offer the potential to efficiently bill drivers for parking and alert law enforcement of trespassers.
- Reformed parking policies can increase fairness, so that, for example, people who use transit or walk do not have to pay higher prices or suffer reduced wages, due to parking.
- Methods to unbundle parking cost are inefficient unless they support the spontaneous sharing of parking spaces. Shared parking with unbundled cost would ultimately allow cities to require significantly less parking.
- Typical systems of timed parking and metered parking are far from ideal. Such parking has no automated record keeping, so it is difficult to know where there is too much or too little.
- Good policies will eventually let cities turn parking minimums into parking maximums.

Less land and resources devoted to parking will support mixed use and make "smart growth" more economically viable. It should therefore be a key ingredient supporting the SANDAG's stated desire to foster "smart" growth, where "smart" should be defined as "VMT-reducing".

Here is a copy of the abstract of the paper.

The *Introduction* shows documented driving reductions due to the pricing of parking. It notes that although the benefits of priced and shared parking are known, such parking has not been widely implemented, due to various concerns. It states that a solution, called "*Intelligent Parking*," will

overcome some of these concerns, because it is easy to use and naturally transparent. It asserts that this description will support a “Request for Proposal” (RFP) process. Eight background information items are provided, including how priced parking would help California achieve greenhouse gas reduction targets. A story demonstrates some of the key features of *Intelligent Parking*. Arguments for less parking, shared parking, and priced parking are made. Barriers to progress are identified. The fair pricing of parking is described. New ways to characterize transportation demand management are presented. Seven goals of *Intelligent Parking* are listed. Eleven definitions and concepts, that together define *Intelligent Parking*, are described. This includes a method to compute a baseline price of parking and how to adjust that price instantaneously to keep the vacancy above 15% (“Congestion Pricing”). An implementation strategy is described.

This abstract aroused enough interest among those responsible for A&WMA’s *Sustainable Land Use and Parking* session that they requested that I submit a manuscript, which was ultimately selected to become part of the written Conference Proceedings and for presentation. I hope that it will similarly arouse the interest in the SANDAG Board and staff. SANDAG needs to consider working to execute the implementation strategy described in *A Plan to Efficiently and Conveniently Unbundle Car Parking Costs*. I would be honored to help in any way possible.

This strategy, by itself, would probably decrease driving throughout California by between 15% and 25%. This is shown by Table 1 of *A Plan to Efficiently and Conveniently Unbundle Car Parking Costs*, Reference 4.

4.4 Increase Bicycle Use: Education and Projects to Support Bicycle Transportation

The criteria for spending money for bicycle transportation should be to maximize the resulting estimated reductions in driving. The SANDAG board has been told this many times but they ignore this suggestion. SANDAG has so many criteria for bicycle projects that the result is that staff can spend their “bicycle money” however they want. As usual, the Directors provide no useful direction. For RTP2030, SANDAG has \$270M to spend on bicycle transportation. The following strategies will maximize driving reductions.

4.4.1 Projects

Each of the smart growth place types, both existing and planned, should be checked to see if bicycle access could be substantially improved with either a traffic calming project, a “complete streets” project, more shoulder width, or a project to overcome some natural or made-made obstacle. These projects should be prioritized using a cost/benefit ratio metric. It is hereby assumed that 40% of the \$270M available for SANDAG’s Regional Bicycle Plan should be used to fund the projects. They should be selected for implementation, from the top of the list (lowest cost/benefit ratio) down, until the money (about \$110M) is used up. An example of one of these projects, for the proposed town center near the corner of I-5 and SR-78, is to build a pedestrian/bike bridge, over I-5, to reconnect West Vista Way in Oceanside. This would better connect a coastal neighborhood with a large regional shopping center. The current bicycle route requires more distance and a significant hill to climb over.

4.4.2 Education

The remaining 60% of the \$270M, about \$160M, should be used to

- 1.) Teach interested adults about bicycle accident statistics (most serious injuries occur to cyclists in accidents that do not involve a motor vehicle), car-bike accident statistics (most are caused by wrong-way riding and errors in intersections; clear cut, hit-from-behind is rare), and how to ride in all conditions, to minimize problems.

2.) Teach riding-in-traffic skills and how to ride in other challenging conditions, by having the class members and instructor go out into real conditions and ride together, until proficiency is achieved.

Students that pass a rigorous written test and demonstrate proficiency in riding in traffic and other challenging conditions are paid for their time and effort. These classes should be based on the curriculum developed by the League of American Bicyclists and taught by instructors certified by the League.

Assuming a class size of 3 riders per instructor and that each rider passes both tests and earns \$100 and that the instructor, with overhead, costs \$500 dollars, for a total of \$800 for each 3 students, means that the \$160M could educate $\$160M/\$800 = 200,000$ classes of 3 students, for a total of 600,000 students. This is about 20% of the population of San Diego County.

This strategy, by itself, would decrease driving in San Diego County by at least 5%.

4.5 Replacing Freeway Expansion Projects by Transit Redesign, Construction, and Operations

4.5.1 Background Information

SANDAG's 2007 RTP, "RTP2030", calls for increasing the number of freeway lanes by 38%. This would be in a region that already had one of the highest VMT-per-capita metrics in the state. SANDAG also supported a sales tax measure, "TRANSNET", that was advertised as one that would spend two-thirds of its money on roads and one-third on transit. However, after it was passed, SANDAG defined all HOV lanes to be "transit", thereby significantly reducing the fraction of money spent on true transit.

Out of a \$57 billion dollar budget for RTP2030, SANDAG budgeted about 1% for mitigation. This mitigation is split evenly between "smart growth" incentive money and a *Regional Bicycle Plan*. They have published a *Smart Growth Incentive Plan*, a *Smart Growth Design Guideline*, as well as the *Regional Bicycle Plan*. SANDAG has an excellent staff. However, the Board does not provide useful direction. One obvious direction needed was to adopt a metric of reducing VMT to decide what "smart growth" should get funding, what "smart growth" design guidelines should be adopted, and what bicycle programs should be funded. They were asked repeatedly to put citizen comments, directed toward the early drafts of these documents, on line, to be viewed by all. Not doing this made it easy for the staff to ignore significant public comment and to instead spend bike money mostly for trails and smart-growth money for beautification projects in areas deemed suitable for eventual smart growth. If reduced driving reductions were used as a criteria for spending money, then funding the League of American Bicyclist's class on how to ride a bike in traffic and the development of equitable and environmentally-sound parking policy (good enough to be politically acceptable), would have been a large part of the spending. Instead, bicycle education and car-parking policies were marginalized to the point of being essentially unfunded.

4.5.2 Putting a Stop to Freeway Expansion

One of the most powerful strategies to reduce GHG would be to stop expanding freeways. Instead of costing money, it would generate money. It is well understood that the metric of freeway-lane miles per square mile of developed land increases an area's average car-trip length and thereby increases VMTs. SANDAG is ignoring this fact and this is probably one of the primary reasons that its 2035 GHG Reduction Target is unacceptably small. When the SANDAG TRANSNET tax was passed, few voters understood that we were threatened with a climate catastrophe and that our responsibility was to drive significantly less. Given our current understanding, The SANDAG Board has a responsibility to either pass by a two-thirds vote a motion to reconfigure TRANSNET, or go back to voters with a ballot measure, to reconfigure TRANSNET, to be 67% for transit. The 33% for road maintenance can be retained and used as an incentive to get cities to unbundle the cost of their parking.

One current freeway-widening project being considered is to widen I-5 from 8 to either 12 or 14 lanes, from La Jolla to Camp Pendleton, at a cost of over \$3.5 billion dollars. The DEIR was released in early July. Caltrans held public meetings, where no member of the public is allowed to speak publicly. It sent postcard notifications to those living along the route. However, instead of honestly notifying the recipients of the radical, land-consuming nature of the proposal, these postcards only refer to a “managed lane project”. Nowhere on the postcard was there any information suggesting a wider freeway, a taking of land, a reducing of property-tax rolls, an increase in noise, an increase in driving, an increase in air pollution, an increase in GHG or even that there is any kind of construction project being proposed.

If TRANSNET was reconfigured to support transit, the Coaster service, for example, could be redesigned into an electric, automated system that would operate 24 hours a day, 7 days a week. With skip-stop stations, travel time from Oceanside to San Diego could be substantially decreased, especially at off-peak times.

This strategy, by itself, would decrease driving in San Diego County by between 5% and 10%.

4.6 Conclusions

The best strategies to reduce VMT are shown here, with the estimated driving reductions for each one shown in square brackets:

- Comprehensive (equitable and environmentally sound) road use fee pricing system, as could be installed by *Skymeter*; [15%]
- Unbundling the cost of car parking; [15%] (This estimate is based on Table 1 of Reference 4.)
- Good bicycle projects and bicycle education; [5%,] (This estimate should be checked by the League of American Bicyclist.)
- Stopping all freeway expansions and reconfiguring TRANSNET to be 67% for transit and 33% for road maintenance [10%] (This is a conservative estimate, especially if the CNFF’s “50-10” projects are adopted.)

These strategies could be implemented by 2020, not 2035, and would decrease per capita driving by a sum of at least 45% (15+15+5+10). The strategies to do this are primarily those that increase fairness for all, especially families that drive less than average.

Conclusion

This DEIR must be rewritten to correct the nine fatal errors shown and discussed in Section 1.0.

Sections 2, 3, and 4 are added to help SANDAG act responsibly, so our region can meet its climate-crisis responsibilities, based on science. The mitigations and the “Equitable Alternative”, defined within this letter, will help SANDAG accomplish this critical task.

These mitigations, which, when summed, amount to an alternative that achieves all goals, would also eliminate congestion, clean up our air, increase equity, and offer more choices to people in San Diego County. People would have more transit choices and more choices over how they spend their own money.

Respectfully submitted,



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Chair of the Sierra Club San Diego Transportation Committee

References

Note: All References were attached in the email sent to SANDAG

- 1.) Letter, Sierra Club Transportation Chair to SANDAG Board, *California Air Resources Board (CARB) Greenhouse Gas (GHG) Reduction Targets, Issued to SANDAG, in Accordance with SB 375, for the Year 2035*, April 20, 2011
- 2.) M. Bullock to Rob Rundle, Comments Regarding Notice of Preparation – Programmatic EIR Project Description and Scope of Environmental Analysis 2050 Regional Transportation Plan, June 17, 2010
- 3.) Letter from *Center for Biological Diversity*, to Elaine Chang, Deputy Executive Officer of Planning, Rule Development, and Area Sources of the South Coast Air Quality Management District; *Comments on Survey of CEQA Documents on Greenhouse Gas Emissions Draft Work Plan and Development of GHG Threshold of Significance for Residential and Commercial Projects*; April 15, 2009. Available upon request from Mike Bullock, mike_bullock@earthlink.net
- 4.) M. Bullock & J. Stewart, *A Plan to Efficiently and Conveniently Unbundle Car Parking Costs*; Paper 2010-A-554-AWMA, from the Air and Waste Management Association’s 103rd Annual Conference and Exhibition; Calgary, Canada, June 21-24, 2010; available upon request from Mike Bullock, mike_bullock@earthlink.net.
- 5.) Power Point Presentation to Board, “Governor’s Executive Order S-3-05 and SB375 Target Implications for SANDAG, May 13, 2011. Presented by Mike Bullock and Ellen Schively, as can be heard on audio file of meeting, <http://www.sandag.org/index.asp?fuseaction=meetings.sc&mid=BOD051311>, starting at 1 minute and 16 seconds into the meeting
- 6.) Letter, Bullock to Andrew Martin, Senior Regional Planner, SANDAG, *Transportation-Related Comments Re: the Preliminary Draft of RCAP of January 14, 2010*; January 27th, 2010.
- 7.) Letter, Bullock to the Honorable President Richard Holober and Members of the Board of Trustees, San Mateo County Community College District; *An Updated Parking Policy, in Light of the Controversy Surrounding the Removal of Building 20, Greenhouse, and Gardens, to Add Parking*; July 27, 2011

The San Diego Chapter of the Sierra Club is San Diego’s oldest and largest grassroots environmental organization, founded in 1948. Encompassing San Diego and Imperial Counties, the San Diego Chapter seeks to preserve the special nature of the San Diego and Imperial Valley area through education, activism, and advocacy. The Chapter has over 14,000 members. The National Sierra Club has over 700,000 members in 65 Chapters in all 50 states, and Puerto Rico.



A Plan to Efficiently and Conveniently Unbundle Car Parking Costs

Paper 2010-A-554-AWMA

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ABSTRACT

The *Introduction* shows documented driving reductions due to the pricing of parking. It notes that although the benefits of priced and shared parking are known, such parking has not been widely implemented, due to various concerns. It states that a solution, called “*Intelligent Parking*,” will overcome some of these concerns, because it is easy to use and naturally transparent. It asserts that this description will support a “Request for Proposal” (RFP) process. Eight background information items are provided, including how priced parking would help California achieve greenhouse gas reduction targets. A story demonstrates some of the key features of *Intelligent Parking*. Arguments for less parking, shared parking, and priced parking are made. Barriers to progress are identified. The fair pricing of parking is described. New ways to characterize transportation demand management are presented. Seven goals of *Intelligent Parking* are listed. Eleven definitions and concepts, that together define *Intelligent Parking*, are described. This includes a method to compute a baseline price of parking and how to adjust that price instantaneously to keep the vacancy above 15% (“Congestion Pricing”). An implementation strategy is described.

INTRODUCTION:

It has been well established that appropriately priced parking will significantly reduce driving¹. Most case studies presented in Table 1 are evaluations of the most general type of “car-parking cash-out”: *a program that pays employees extra money each time they get to work without driving*. They show that a price differential between using parking and not using parking will significantly reduce driving, even when transit is described as poor. Since driving *must* be reduced², the pricing of parking is desirable.

Shared parking is also recognized as desirable because it can sometimes result in less parking being needed.

Although the advantages of pricing and sharing parking have been recognized for many years, these practices are still rare. This paper identifies some of the reasons for this lack of progress. The pricing and sharing method of this paper has a natural transparency and ease of use that would reduce many of the concerns. This paper also suggests that those governments that have the necessary resources can take the lead role in developing and implementing the described systems. These governments will recover their investments, over time.

This paper describes how parking facilities could be tied together and operated in an optimum system, named *Intelligent Parking*. The description of *Intelligent Parking* is sufficient to support a “Request for Proposal” process, leading to full implementation.

There are two distinct parts to *Intelligent Parking*. The first is how to set the price. The second is how to distribute the earnings. Briefly, the earnings go to the individuals in the group for whom the parking is built.

Table 1 Eleven Cases of Pricing Impact on Parking Demand

| Location | Number of Workers @ Number of Firms | 1995 \$'s Per Mo. | Parking Use Decrease |
|--|--|------------------------------|---------------------------------|
| <i>Group A: Areas with poor public transportation</i> | | | |
| West Los Angeles | 3500 @ 100+ | \$81 | 15% |
| Cornell University, Ithaca, NY | 9000 Faculty & Staff | \$34 | 26% |
| San Fernando Valley, Los Angeles | 850 @ 1 | \$37 | 30% |
| Costa Mesa, CA | Not Shown | \$37 | 22% |
| Average for Group | | \$47 | 23% |
| <i>Group B: Areas with fair public transportation</i> | | | |
| Los Angeles Civic Center | 10,000+ @ "Several" | \$125 | 36% |
| Mid-Wilshire Blvd, Los Angeles | 1 "Mid-Size" Firm | \$89 | 38% |
| Washington DC Suburbs | 5,500 @ 3 | \$68 | 26% |
| Downtown Los Angeles | 5,000 @ 118 | \$126 | 25% |
| Average for Group | | \$102 | 31% |
| <i>Group C: Areas with good public transportation</i> | | | |
| U. of Washington, Seattle, WA | 50,000 employees, students | \$18 | 24% |
| Downtown Ottawa, Canada | 3,500 government staff | \$72 | 18% |
| Bellevue, WA | 430 @ 1 | \$54 | 39%* |
| Average for Group, except Bellevue, WA Case* | | \$45 | 21% |
| Overall Average, Excluding Bellevue, WA Case* | | | 25% |

* Bellevue, WA case was not used in the averages because its walk/bike facilities also improved and those improvements could have caused part of the decrease in driving.

PERTINENT BACKGROUND INFORMATION

- Vehicle miles traveled (VMT) are a major cause of global warming and pollution^{2,3}.
- California's Metropolitan Planning Organizations (MPOs) will need to adopt strategies that reduce vehicle miles traveled (VMT), in order to meet SB375 GHG reduction targets, to be issued by the California Air Resources Board in late 2010, for years 2020 and 2035².
- The appropriate pricing of parking is one of the least costly documented tools to reduce VMT.
- New technologies, such as sensors feeding computer-generated billing, offer the potential to efficiently bill drivers for parking and alert law enforcement of trespassers.
- Reformed parking policies can increase fairness, so that, for example, people who use transit or walk do not have to pay higher prices or suffer reduced wages, due to parking.

- Methods to unbundle parking cost are inefficient unless they support the spontaneous sharing of parking spaces. Shared parking with unbundled cost would ultimately allow cities to require significantly less parking.
- Typical systems of timed parking and metered parking are far from ideal. Parking has no automated record keeping, so it is difficult to know where there is too much or too little.
- Good policies will eventually let cities turn parking minimums into parking maximums.

A GLIMPSE INTO A POSSIBLE FUTURE

Jason is driving to work for the first time in several years. He has decided to save money by carrying home a new 3-D, big-screen computer, which he plans to purchase at a store near his office after work. He wanted to avoid paying delivery charges.

Things have been changing around his office development since they unbundled the cost of parking at the near-by train station. Many people who caught the early trains and lived close to the station stopped driving and parking in the best parking spaces; demand for housing close to the station went up; and wealthy riders, who insisted on driving, did so, confident that they could always find parking as close to the platform as their schedules required, due to congestion pricing. Who would have guessed how much those people were willing to pay? It was shocking. Parking-lot earnings, paid to round-trip train riders, meant that the net cost to ride the train went significantly down. Ridership and neighborhood vitality both went significantly up. All Jason knew was that the price to park at his office had been going up yearly because of increased land values. His parking-lot earnings from his office had been increasing almost every month, due to the ripple effect of train riders parking off-site at cheaper parking. Some of them were using his office parking.

As he pulls out of his driveway, he tells his GPS navigation unit his work hours (it already knew his office location), the location of the store where he plans to buy the computer, and his estimated arrival and departure times at the store. He tells the GPS unit he wants to park once, park no more than 1 block from the store, walk no more than 1 mile total, and pay no more than an average of \$2 per hour to park. He is not surprised to hear the GPS tell him that his request is impossible. He tells the GPS he will pay an average of \$3 per hour and learns that the GPS has located parking.

It guides him into a church parking lot. He hopes the church will use his money wisely. The GPS tells him the location of a bus stop he could use to get to work and the bus's next arrival time at the stop. With automatic passenger identification and billing, the bus has become easy to use, except that it is often crowded. Jason gets out of the car and walks to work, with no action required regarding the parking.

Three weeks later, when Jason gets his monthly statement for his charges and income for automotive road use, transit use, parking charges, and parking earnings, he finds that the day's parking did indeed cost about \$30 for the 10 total hours that he parked. He notes that the parking-lot earnings for his office parking averaged about \$10 per day that month. He then notices the parking lot earnings from the store, where he spent about \$1000 dollars. He sees that the parking-lot earnings percent for the store that month was 1.7%, giving him about \$17. So for the day, Jason only spent a net of about \$3 on parking. Then he realized that he should have had the computer delivered after all. If he would have bicycled that day, as he usually did, he would have still gotten the \$27 earnings from the two parking facilities and he would have paid nothing

for parking. So the choice to drive cost him \$30. He remembers that the delivery would have only been \$25 dollars. Oh well. He enjoyed his before-work and after-work walks.

THE CASE FOR LESS PARKING

Less parking will support more compact development.¹ This makes walking and biking more enjoyable and less time consuming. There would certainly be less “dead space”, which is how parking lots feel to people, whether they arrive by car or not, after they become pedestrians.

Since parking can be expensive, less parking can reduce overhead costs significantly, such as leasing expense and parking-lot maintenance cost. Less overhead means more profit and less expense for everyone. A need for less parking can create redevelopment opportunities at existing developments and reduce project cost at new developments.

At new developments, car-parking costs could prevent a project from getting built.²

THE CASE FOR SHARED PARKING

Shared parking for mixed uses means that less parking is needed. For example, shared parking could be used mostly by employees during the day and mostly by residents at night.

Fully shared parking means that very little parking would be off limits to anyone. In a central business district with shared parking, drivers would be more likely to park one time per visit, even when going to several locations. Pedestrian activity adds vitality to any area.

THE CASE FOR APPROPRIATELY-PRICED PARKING

To Reduce Driving Relative to Zero Pricing

Traditional Charging or Paying Cash-out Payments

As shown in the Introduction, this relationship (pricing parking reduces driving) is not new.³

Using results like Table 1, at least one study⁴ has used an assumption of widespread pricing to show how driving reductions could help meet greenhouse gas (GHG) target reductions. Dr. Silva Send of EPIC <http://www.sandiego.edu/epic/ghgpolicy/> assumes that all work locations with 100 employees or more in San Diego County will implement cash-out, to result in 12% less driving to work. Currently, almost all employees in San Diego County “park for free”, unless they happen to work in a downtown core area.

¹ This is especially true of surface parking, which only accommodates 120 cars per acre.

² On September 23, 2008, a panel of developers reviewed the Oceanside, Ca. “Coast Highway Vision” http://www.ci.oceanside.ca.us/pdf/chv_finalvisionstrategicplan.pdf. Parts of this plan were described as smart growth.

At the review, developer Tom Wiegel said, “Parking is the number 1 reason to do nothing,” where “do nothing” meant “build no project.” The other developers at the meeting agreed.

³ For many years the Victoria Transport Policy Institute (VTPI) has been recognized as a source of reliable information on “Transportation Demand Management”, or TDM.

From http://www.vtpi.org/tdm/tdm72.htm#_Price_Parking:

Even a relatively small parking fee can cause significant travel impacts and provide significant TDM benefits. “TDM Benefits” refers to the many public and private benefits of having fewer people choosing to drive.

Current, Best-Practice “Unbundling”

The “best-practice” use of the phrase, “unbundled parking cost”, is to describe the case where either the cost of parking, for the case of a condominium, or the rent for parking, for the case of an apartment, is separated from either the purchase price and common fees or the rent of the dwelling unit.

This gives the resident families the choice of selecting the number of parking spaces they would like to rent or buy, including the choice of zero. This would tend to reduce the average number of cars owned per dwelling unit and, in this way, would also tend to reduce driving. Its major drawback is that this method does not encourage sharing.

To Increase Fairness and Protect the US Economy

It is stated above that almost all employees in San Diego County “park for free”. Of course there is really no such thing as “parking for free”. So-called “free parking” always reduces wages or increases costs. At a work site, it reduces everyone’s wage, even those employees that never drive. At an apartment complex, so-called “free parking” increases the rent. Therefore, “free parking” at work or at apartments violates the fundamental rule of the free market, which is that people should pay for what they use and not be forced to pay for what they do not use. Parking should at least be priced to achieve fairness to non-drivers.

The US economy would also benefit. Reductions in driving would lead to reductions in oil imports, which would reduce the US trade deficit.⁴

BARRIERS TO PROGRESS

Given all this, it might seem that the widespread pricing of parking should have happened by now. However there are barriers. In 2007, a majority of the City Council of Cupertino, Ca. indicated that they wanted their City Manger to negotiate reduced parking requirements with any company that would agree to pay sufficient cash-out payments. To this date, no company, including Apple Inc., has expressed an interest. Most companies probably perceive cash-out as expensive. Even if they realize they could get a reduced parking requirement in exchange for paying sufficient cash-out amounts and even if the economics worked in support of this action (quite possible where land is expensive), they want to stay focused on their core business, instead of getting involved in new approaches to parking, real estate, and redevelopment.

On the other hand, simply charging for parking and then giving all the employees a pay raise is probably going to run into opposition from the employees, who will feel that they would be losing a useful benefit.

In addition, neighbors fear the intrusion of parked cars on their streets. Permit parking, which could offer protection, is not always embraced. City Council members know that a sizable fraction of voting citizens believe that there can actually never be too much “free parking”,

⁴ From http://en.wikipedia.org/wiki/Balance_of_trade#Warren_Buffett_on_trade_deficits, Warren Buffet wrote in 2006,

“The U.S. trade deficit is a bigger threat to the domestic economy than either the federal budget deficit or consumer debt and could lead to political turmoil. Right now, the rest of the world owns \$3 trillion more of us than we own of them.”

Professor Shoup's famous book⁵ notwithstanding. Some Council members probably feel that way themselves.

It doesn't help that current methods of charging for downtown parking are often very inefficient.⁵ For example, downtown Oceanside, California has parking meters that will only accept coins. Besides this, all their on-street, downtown parking is timed, with maximums from 10 minutes to 4 hours. These time limits are enforced by a city employee, who applies chalk from a tire to the street and then records the time. However, by watching the time and moving their car soon enough, drivers can avoid getting a ticket. Of course, they could instead drive to the mall and not have to worry about having coins or elapsed time since parking. It is not surprising that downtown merchants often object to charging for parking.

In summary, those that resist charging for parking, *based on their perceptions*, include

- Companies, *who fear the complexity and expense of paying cash-out payments*;
- Employees, *who fear of losing a current benefit*;
- City leaders, *who fear the political repercussions*;
- Downtown patrons, *who dislike the inconvenience and worry*;
- Downtown business owners, *who fear that it will drive away customers*.

THE COST, VALUE, AND FAIR PRICE OF PARKING

Estimated and Actual Capital Cost

Surface Parking

One acre of surface parking will accommodate 120 cars. Land zoned for mixed use is sometimes expensive. At \$1.2 million per acre, the land for a single parking space costs \$10,000.

Construction cost should be added to this to get the actual, as-built cost of each parking space. Estimated cost can be determined by using appraised land value and construction estimates. For new developments, after the parking is constructed, it is important to note the actual, as-built cost.

Parking-Garage Parking

One acre of parking-garage will accommodate considerably more than 120 cars. The construction cost of the garage and the value of its land can be added together to get the total cost. Dividing that total cost by the number of parking spaces yields the total, as-built cost of each parking space. Adding levels to a parking garage may seem like a way to cut the cost of each parking space, for the case of expensive land. However, there is a limit to the usefulness of this strategy because the taller the parking garage, the more massive the supporting structural members must be on the lower levels, which increases total cost. Parking-garage parking spaces are often said to cost between \$20,000 and \$40,000. The actual costs should be noted.

Underground Parking

In order to compute an estimate for the cost of a parking space that is under a building, it is necessary to get an estimate of the building cost with and without the underground parking. The difference, divided by the number of parking spaces, yields the cost of each parking space. The

⁵ According to Bern Grush, Chief Scientist of Skymeter Corporation <http://www.skymetercorp.com/cms/index.php>, often two-thirds of the money collected from parking meters is used for collection and enforcement costs.

cost or value of land plays no role in the cost of this parking. However, it does not follow that this parking is cheap. Underground parking spaces are often said to cost between \$60,000 and \$90,000 dollars each. Although there will be an “as built” cost of the building with the parking, there will never be an “as built” cost of the building without the parking. However, after the construction is done, the estimate for the cost of the underground parking should be reconsidered and re-estimated if that is needed. The final, best-estimate cost should be noted.

Value

Initially, value and cost are the same. For surface parking and parking-garage parking, the value would initially be the same as the as-built cost. For underground parking, the value would initially be the same as the best-estimate cost. However, over time, the value must be updated. Both construction costs and land-value costs will change. The value assigned to a parking place should always be based on the current conditions.

Fair Pricing

Parking space “values”, as described above, must first be converted to a yearly price by using a reasonable conversion factor. This conversion factor could be based on either the “cost of money” or the “earnings potential of money”. It is expected that this conversion factor would be 2% to 5% during times of low interest rates and slow growth; but could be over 10% during times of high-interest and high growth. For example, if the surface parking value is \$12,000 and it is agreed upon to use 5% as the conversion factor, then each parking spot should generate \$600 per year, just to cover capital costs. The amount needed for operations, collection, maintenance, depreciation, and any special applicable tax is then added to the amount that covers capital cost. This sum is the amount that needs to be generated in a year, by the parking space.

The yearly amount of money to cover capital cost needs to be re-calculated every year or so, since both the value and the conversion factor will, in general, change each year. The cost of operations, collection, maintenance, depreciation, and any special applicable tax will also need to be reconsidered.

Once the amount generated per year is known, the base price, per unit year, can be computed by dividing it (the amount generated per year) by the estimated fraction of time that the space will be occupied, over a year. For example, if a parking space needs to generate \$900 per year but it will only be occupied 50% of the time, the time rate charge is \$1800 per year. This charge rate per year can then be converted to an hourly or even a per-minute rate. The estimated fraction of time that the parking is occupied over a year will need to be reconsidered at least yearly.

NEW DEFINITIONS TO PROMOTE AN OBJECTIVE VIEW OF PRICING

- The “fair price” means the price that accounts for all costs.
- The “baseline amount of driving” means the driving that results from the application of the fair price.
- “Zero transportation demand management” (“zero TDM”) is the amount of demand management that results when the fair price is used. It will result in the baseline amount of driving.
- “Negative TDM” refers to the case where the price is set below the fair price. This will cause driving to exceed the baseline amount. Since TDM is commonly thought to be an action that reduces driving, it follows that negative TDM would have the opposite effect.
- “Positive TDM” refers to the case where the price is set above the fair price. This would cause the amount of driving to fall below the baseline amount.

Clearly, so-called “free parking” is an extreme case of negative TDM. The only way to further encourage driving would be to have a system that pays a driver for the time their car is parked.

THE GOALS OF *INTELLIGENT PARKING*

- There is only one agency operating all parking. (“All parking” does not include driveways and garages in single-family homes.) *Intelligent Parking* is designed and installed by regional or state government, using low-bid contractors, with design and start-up costs covered by the overhead portion of collection fees.
- Nearly all parking is shared. Almost always, anyone can park anywhere. Those who want exclusive rights to parking will pay “24/7” (all day, every day).
- Parking is operated so that the potential users of parking will escape the expense of parking by choosing to not use the parking. This characteristic is named “unbundled” because the cost of parking is effectively unbundled from other costs.
- Parking is priced and marketed to eliminate the need to drive around looking for parking.
- Parking at any desired price is made as easy as possible to find and use.
- Records of the use of each parking space are kept, to facilitate decisions to either add or subtract parking spaces.
- The special needs of disabled drivers, the privacy of all drivers, and, if desired, the economic interests of low-income drivers are protected.

DEFINITIONS & CONCEPTS OF *INTELLIGENT PARKING*

Parking Beneficiary Groups

There are at least 7 types of beneficiary groups. Note that in all cases, members of beneficiary groups must be old enough to drive.

- 1.) People who have already paid for the capital cost of parking. An example of this type of beneficiary group would be the owners of condominiums, where parking has been built and the cost is included in the price of the condominium. Note that although they have technically already paid for the parking, if they borrowed money to pay for some portion of the price, the cost is built into their monthly payment. This illustrates why the value of parking and the cost of borrowing money (rate of return on money) are key input variables to use to compute the appropriate base, hourly charge for parking.
- 2.) People who are incurring on-going costs of parking. An example of this type of beneficiary group is a set of office workers, where the cost of “their” parking is contained in either the building lease or the cost of the building. Either way, the parking costs are reducing the wages that can be paid to these employees.⁶
- 3.) People who are purchasing or renting something where the cost of the parking is included in the price. Examples of this beneficiary group are people that rent hotel rooms, rent an apartment, buy items, or dine in establishments that have parking.

⁶ Such parking is often said to be “for the benefit of the employees”. Defining this beneficiary group will tend to make this statement true, as opposed to the common situation where the employees benefit only in proportion to their use of the parking.

- 4.) People who own off-street parking as a business. They could be the individual investors or could be a government or government-formed entity.
- 5.) People who are said to benefit from parking, even though the money for the parking has been supplied by a source that may have very little relationship to those that are said to benefit. An example of this group would be train riders that make round trips from a station which has parking that is said to be “for riders”. Students at a school with parking would be another example.
- 6.) People who are considered by many to be the logical beneficiaries of on-street parking. Owners of single-family homes are the beneficiaries of the parking that is along the boundaries of their property. The same status is given to residents of multi-family housing.
- 7.) Governments. Since they build and maintain the streets, they should get a significant benefit from on-street parking.

Unbundled Cost and Spontaneous Sharing

“Unbundled cost” means those who use the parking can see exactly what it costs and those who don’t use the parking will either avoid its cost entirely or will get earnings to make up for the hidden parking cost they had to pay. This conforms to the usual rule of the free market where a person only pays for what they choose to use. Unbundled cost is fair.

“Spontaneous sharing” means that anyone can park anywhere at any time and for any length of time. Proper pricing makes this feasible.

How to Unbundle

The method of unbundling can be simply stated, using the concept of “beneficiary group” as discussed above. First, the fair price for the parking is charged. The resulting earnings⁷ amount is given to the members of the beneficiary group in a manner that is fair to each member. Methods are described below.

Why this Supports Sharing

Members of a beneficiary group benefit financially when “their” parking is used. They will appreciate users increasing their earnings. They are also not obligated to park in “their” parking. If there is less-expensive parking within a reasonable distance, they might park there, to save money. This is fine, because all parking is included in the *Intelligent Parking* system.

Computing the Earnings for Individuals

Intelligent Parking must be rigorous in paying out earnings⁷. For a mixed use, the total number of parking spaces must first be allocated to the various beneficiary groups. For example in an office/housing complex, 63.5% of the parking might have been sold with the office. If so, the housing portion must be paying for the other 36.5%. For this case, it would follow that the first step is to allocate 63.5% of the earnings to the workers and 36.5% to the residents.

⁷ The earnings amount is the revenue collected minus the collection cost and any other costs that will have to be paid due to the implementation of *Intelligent Parking*. The costs associated with the parking, paid *before* the implementation of *Intelligent Parking*, should *not* be subtracted from the revenue because they will continue to be paid as they were before the implementation of *Intelligent Parking*. Therefore, these costs will continue to reduce wages and increase the prices of goods and services.

How the monthly earnings are divided up among the members of the beneficiary group depends on the beneficiary group type. For each member, the group's total monthly earnings amount is always multiplied by a quantity and divided by the sum (the sum is the denominator) of that quantity, for all members.

For example, for each employee, the multiplier is the number of hours that the employee worked over the month while the denominator is the total number of hours worked by all employees over the month. At a school, for each student, the numerator is the total time spent at the school, over the month, while the denominator is the sum of the same quantity, for all the students.

For a train station with parking being supplied for passengers that ride on round trips of one day or less, the numerator is the passenger's monthly hours spent on such round trips, over the month; while the denominator is the total number of hours spent by all passengers on such round trips, over the month. Radio Frequency Identification (RFID) units on passengers could support an automated calculation of monthly charges for fares, as well as monthly hours on round trips.

At a shopping center, the numerator is the sum of the money spent by the shopper, over the month, while the denominator is the total amount of money spent by all shoppers over the month.

At a condominium, the numerator is the number of parking places that were paid for (directly or indirectly) by the resident family and the denominator is the total number of parking places at the condominium project; similarly, for apartment complexes.

Where Earnings Are Low

The goal is that if someone doesn't park, they don't pay, either directly or indirectly, because the earnings that they get will balance out their losses (like reduced wages, for example). However, charging for parking that few want to use will not sufficiently compensate the people that have been forced, or are being forced, to pay for such parking. The only remedy in this case is to redevelop the parking or lease the parking in some other way, for storage, for example. The earnings from the new use should go to those that are in the beneficiary group that was associated with the low-performing parking.

Why This Method of Unbundling Will Feel Familiar to Leaders

Developers will still be required to provide parking and will still pass this cost on, as has been discussed. There will be no need to force an owner of an exiting office with parking to break his single business into two separate businesses (office and parking).

Parking beneficiaries are identified that conform to traditional ideas about who should benefit from parking.⁸

Unbundling the Cost of On-Street Parking

The revenue from on-street parking in front of businesses will be split evenly between the city and the business's parking beneficiaries. All of the earnings from on-street parking in front of apartments or single-family homes will be given to the resident families.⁹

⁸ Showing exactly where parking earnings go will reduce the political difficulties of adopting pay parking in a democracy where the high cost of parking is often hidden and rarely discussed.

⁹ Although governments own the streets, often, back in history, developers paid for them and this cost became embedded in property values. Admittedly, how to allocate on-street parking earnings is somewhat arbitrary. With

Special Considerations for Condominiums

Unbundling for a condominium owner means that, although their allocated amount of parking has added to their initial cost, their allocated amount of parking also earns money for them. Unbundling for a condominium could also mean that an owner can choose to have control over a single or several parking places. Such parking spaces could be equipped with a red light and a green light. If the red light is lit, this will mean that the space is not available for parking, except for the person who is controlling the spot. If the green light is lit, it will mean that the space is available to anyone. A space that is being reserved with a red light is charged at the full price to the condominium owner that has control over the space. The owner that controls these spaces can change the state of the parking space (available or not available) by either a phone call, on line, or at any pay station system that might be in use for the system. After condominium owners experience the cost of reserving a space for themselves, they might give up on the idea of having their own, personal, unshared parking space; especially since *Intelligent Parking* will give most owners and their guests all the flexibility they need in terms of parking their cars.

Some people think that condominium parking should be gated, for security reasons. However, parking within parking garages needs to be patrolled at the same frequency level as on-street parking, which is enough to ensure that crime around either type of parking is very rare. Cameras can help make parking garages that are open to the public safe from criminal activity.

Special Considerations for Renters

Unbundling for renters means that, although their allocated amount of parking increases their rent, their allocated amount of parking also earns money for them. Therefore, their traditional rent (includes parking) is effectively reduced by the money earned by those parking spaces allocated to them. Renters will be motivated to either not own a car or to park in a cheaper location. Parking in a cheaper location is not a problem because all parking is part of the *Intelligent Parking* system. Renters will welcome anyone to park in “their” parking, because it will increase their earnings.

Special Considerations for Employers

At first, companies may want the option of offering “free parking” to their employees so as to be able to compete with traditional job sites. This means giving employees that drive every single day an “add-in” amount of pay so that the sum of the add-in and their parking-lot earnings equals their charge, for any given monthly statement. The operator of the parking, which sends out statements, can pay out the “add in” amount, in accordance with the company’s instruction. The company will then be billed for these amounts. There could be no requirement for the company to provide any such “add-in” amount to the employees that don’t drive every day. This would allow the company to treat its every-day drivers better than other employees and so this would be a negative TDM. However, this economic discrimination would be substantially less than the current, status-quo, economic discrimination, where drivers get “free” parking and non-drivers get nothing.

Clusters of Parking

Clusters are a contiguous set of parking spaces that are nearly equal in desirability and thus can be assigned the same price. They should probably consist of from 20 to 40 spaces. For off-street

congestion pricing and efficient methods, governments may earn significantly more than they are under current practices.

parking, they could be on either side of the access lane to the parking spaces, so that an observer could see the 20 to 40 cars, and get a feel for the vacancy rate. At a train station, clusters will normally be organized so that their parking spaces are approximately an equal distance from the boarding area. On-street clusters would normally conform to our current understanding of what a block is, which is to say from one cross street to the next cross street. The width of the street and the length of the block should be taken into account in defining on-street clusters of parking and in deciding if the parking on either side of the street should or should not be in the same cluster of parking spaces.

Examples of Good and Bad Technology

Parking Meters or Pay Stations

Parking meters are a relic of an earlier period, before computers. Pay stations do not add enough usefulness to merit their inclusion in *Intelligent Parking*, except as a bridge technology. Once good systems are set up, pay stations should cost additional money to use because of their expense. It would be best to devise an implementation strategy that will minimize their use when the system is first put into effect and will take them out of service as soon as possible.

Radio Frequency Identification Backed Up by Video-Based “Car Present” and License Recognition

Government will eventually enter into an RFID (Radio Frequency Identification) age. Organizers of large athletic events already have. Organizers that put on large open-water swims, foot races, and bike rides have routinely used RFID for many years.¹⁰ An RFID vendor in San Diego¹¹ states that passive RFID units cost less than \$5, are reliable, are durable, and they could be used to identify cars as well as people. He also sees no problem in implementing most of the features of *Intelligent Parking*.¹²

Automatic Data Collection and Sending Out Statements

Note that the “back end database” of Dr. Carta’s written statement¹² refers to the ability to send statements of earnings and billing to students.¹³

¹⁰ For example, over 20,000 people ran the 2008 Bay-to-Breakers foot race in San Francisco. Each runner had a “chip” in their shoe lace. Each runner’s start time and finish time were recorded and all results were available as soon as the last runner crossed the finish line.

¹¹David R. Carta, PhD, CEO Telaeris Inc., 858-449-3454

¹² Concerning a Final Environmental Impact Report-approved and funded new high school in Carlsbad, California, where the School Board has signed a *Settlement Agreement* to consider “*unbundled parking*”, “*cash-out*”, and “*pricing*”, Dr. Carta wrote, in a January 13th, 2010 written statement to the Board,

I wanted to send a quick note discussing the technical feasibility of tracking cars into a lot without impacting students or requiring the need for gates. Mike Bullock and I have discussed this project; it can be accomplished straightforwardly by utilizing Radio Frequency Identification and/or Video Cameras integrated with automated license recognition systems. The cars would need to register with the system at the start, but it would be fairly painless for the users after the initial installation. The back end database system can also be implemented both straightforwardly and at a reasonable price.

This is not necessarily a recommendation of the proposal for unbundled parking. Rather it is strictly an unbiased view of the technical feasibility of the proposal to easily and unobtrusively track cars, both registered and unregistered, into a fixed lot.

¹³ In an earlier email on this subject, Dr. Carta wrote,

Putting it Together

Certainly, government, and in particular transit agencies and parking agencies, could use RFID-based technology. For example, when a person with an RFID unit which is tied to a billable address or a credit card with an open account gets on a bus or a train, they should not have to pay at that time, visit a pay station, or “swipe a card” that has a positive balance. Utility customers that pay their bills are not required to pre-pay. The same courtesy should be extended to transit riders, people that drive on roads, people that get parking-lot earnings, and people that park cars. There should be one monthly bill or statement, for all four activities.

Global Positioning Systems GPS

An alternative model is to have GPS systems in cars that would detect the car’s parking location, that location’s current charge rate, and would perform all of the charging functions in the car. The only information the parking-lot-enforcement system would need is whether or not a car being parked is owned by a bill-paying owner. The car owner’s responsibility would be to pay the bills indicated by the box in the car. The box would need to process a signal that a bill had been paid. It would also need to process pricing signals.

Not Picking Winners

The purpose of this report is to describe what an ideal system would do, *not* how it is done. How a proposed system works is left to the systems, software, and hardware engineers that work together to submit a proposal based on this description of what an ideal system does.

Privacy

Privacy means that no one can see where someone has parked, without a search warrant. Also, the level of the detail of information that appears on a bill is selected by the customer.¹⁴

Ease of Use for Drivers

For credit-worthy drivers that have followed the rules of the system, pay parking will not require any actions other than parking. Paying for all parking fees over a month is then done in response to a monthly billing statement. Parking will feel to the consumer like a service provided by a municipality, such as water, energy, or garbage. One important difference is that users belonging to a “beneficiary group” will get an earnings amount in their monthly statement. Those that earn more than what they are charged will receive a check for the difference. This ease of use will make all parking less stressful.

Base Price

Off-Street

This is not too tough - we probably would integrate with a service that already sends physical mail from an electronic submission instead of re-inventing this wheel.

¹⁴ License plates that have no RFID tags fail to use the best technology to accomplish the primary purpose of license plates, which is to identify and help intercept cars used in a crime. Identifying cars is a legitimate government goal. Protecting privacy is also a legitimate goal. Both goals can be realized with good laws, good enforcement, and good systems engineering.

Off-street parking is priced so that even if demand does not threaten to fill the parking beyond 85%, the money generated will at least equate to an agreed-upon return on the parking value and pay all yearly costs. Equation 1 shows the calculation of the hourly rate.

$$r_{BaselineHourly} = \frac{(r_{Investment} \times v_{Parking}) + c_{YOPD}}{(n_{HoursPerYear} \times f_{TO})} \quad \text{(Eq. 1)}$$

where:

| | | |
|----------------------|---|---|
| $r_{BaselineHourly}$ | = | the computed baseline hourly rate to park |
| $r_{Investment}$ | = | yearly return on investment, such as .06 |
| $v_{Parking}$ | = | value of a parking space, such as (parking garage) \$40,000 |
| c_{YOPD} | = | yearly operations ¹⁵ plus depreciation, per space, such as \$100 |
| $n_{HoursPerYear}$ | = | number of hours per year, 24 x 365 = 8760 Hours per Year |
| f_{TO} | = | fraction of time occupied, such as 0.55. |

For the example values given, the base hourly rate of parking, to cover the cost of the investment, operations¹⁵, and depreciation is \$0.519 per hour. This could be rounded up to \$0.52 per hour. This price could also be increased to result in positive TDM, to reduce driving more than the fair-price, zero-TDM amount.

On-Street

If on-street parking is located within walking distance (one-quarter mile) of off-street parking, its base price is set equal to the closest off-street parking's base price. Otherwise, it is set to some agreed-upon value, like fifty cents per hour. However, on-street parking has a special meaning for downtown merchants and for neighborhoods, two powerful political forces in any city. Merchants that have few cars parking on their street, even though it is permitted, are probably failing in their businesses. They would like free parking to help draw visitors to their store front. Neighborhoods that are not impacted by parking would probably prefer no pricing. For these reasons, for any on-street parking cluster, no price is charged until the cluster occupancy reaches 50%. (Time of day is irrelevant.)

Congestion Pricing

The time-rate price of parking is dynamically set on each cluster of parking, to prevent the occupancy rate from exceeding 85% (to reduce the need to drive around looking for parking). An 85% occupancy rate (15% vacancy) results in just over one vacant parking space per city block⁵. If the vacancy rate is above 30%, the price is left at the baseline hourly rate. If vacancies fall below 30%, the price can be calculated in a stair-step method, such as shown in Table 2.

Equation 2 is an alternative method.

In either case, the total charge is time parked, multiplied by the time-averaged, time-rate price. The base multiplier would be adjusted to be just large enough to keep the vacancy rate from falling below a desired level, such as 15%, so it is always easy to find parking.

¹⁵ This includes money for policing, cleaning, maintenance, any applicable parking tax, and all collection costs. Collection costs will need to include an amount to recover the development and installation costs of *Intelligent Parking*.

Table 2 Hourly Rates for 2 Base Multipliers and a Baseline Hourly Rate of \$0.52

| Vacancy Rate | Base Multiplier = 2 | | | Base Multiplier = 2.5 | | |
|--------------|---------------------|-------|-------------|-----------------------|----------|-------------|
| | Multiplication | | Hourly Rate | Multiplication | | Hourly Rate |
| | Formula | Value | | Formula | Value | |
| Above 30% | 2^0 | 1 | \$0.52 | 2.5^0 | 1 | \$0.52 |
| 25% to 30% | 2^1 | 2 | \$1.04 | 2.5^1 | 2.5 | \$1.30 |
| 20% to 25% | 2^2 | 4 | \$2.08 | 2.5^2 | 6.25 | \$3.25 |
| 15% to 20% | 2^3 | 8 | \$4.16 | 2.5^3 | 15.625 | \$8.13 |
| 10% to 15% | 2^4 | 16 | \$8.32 | 2.5^4 | 39.0625 | \$20.31 |
| 5% to 10% | 2^5 | 32 | \$16.64 | 2.5^5 | 97.6563 | \$50.78 |
| Below 5% | 2^6 | 64 | \$33.28 | 2.5^6 | 244.1406 | \$126.95 |

$$r_{HourlyRate} = r_{BaselineHourly} \times (B^{(30-V)/5}), \text{ for } V < 30; r_{BaselineHourly}, \text{ otherwise (Eq. 2)}$$

where:

- $r_{HourlyRate}$ = the congestion-priced hourly rate to park
- $r_{BaselineHourly}$ = the baseline hourly rate to park, such as \$0.52 per hour (taken from from Eq. 1).
- B = the base of the multiplier being computed, such as 2.50
- V = the vacancy rate percent, such as 17.5, for 7 vacancies in a cluster of 40 spaces, $100*(7/40) = 17.5$

For the example values given, the hourly rate of parking would be \$9.88 per hour.

Pricing Predictions and Notifications

Drivers will develop strategies for their routine trips. The computer system that keeps records of parking use will also provide help for users. The *Intelligent Parking* website will direct a user to an appropriate cluster of parking if the user provides the destination location or locations, the time and date, and the hourly rate they wish to pay. If the walk is going to be long, the website could suggest using transit to get from the cheaply-priced parking to the destination. In such cases, the website may also suggest using transit for the entire trip.

Another user option is to specify the time, location, and the distance the user is willing to walk. In this case, the computer would give the cheapest cluster of parking available at the specified walk distance. The price prediction would be provided.

All price predictions would also have a probability of correctness associated with them. If a user can show that a computer has predicted a much lower price than what actually occurred, with a sufficiently high probability, it would be reasonable to charge the user the predicted price rather than the actual price.

Websites could routinely inform viewers when occupancy rates are expected to be unusually high, due to a special event (for example, a sporting event). The parking system website will always give current and predicted hourly rates for all locations. The hourly rates of parking will also be available at a phone number and possibly at pay stations. The base-price hourly rate, for any parking cluster, would be stable and could therefore be shown on signs. Parking garage entrances could have large video screens showing both predicted and existing price. Users will also learn to look at parking and judge whether congestion pricing applies, or could apply, while

their car is parked. It would not be long before these capabilities are added into GPS navigation systems.

Prepaid RFID

To be inclusive, pay stations or convenience stores will offer a pre-paid RFID that can be set on the dashboard of a car. This will support drivers with poor credit or drivers who have not obtained the necessary equipment to support the normal, trouble-free methods. This will also work for drivers that do not trust the system to protect their privacy for a certain trip (by removing or disabling the permanent RFID) or for all trips. No billing would occur.

Enforcement

The system would notify the appropriate law enforcement agency if an unauthorized car was parked. Authorized cars would need either a pre-paid RFID or equipment indicating that their owners had *Intelligent Parking* accounts and were sufficiently paid up on their bills.

IMPLEMENTATION

This description of *Intelligent Parking* will help to implement efficient parking systems. Parking at train stations, schools, and government buildings could introduce many of these concepts. This description of *Intelligent Parking* is sufficient to support a “Request for Proposal” process, which could lead to full implementation. Widespread installation should be done by a government agency, to minimize actions required on the part of the private sector. Laws would simply require the cooperation of all private-sector and government entities.

SUMMARY

A parking plan, *Intelligent Parking* has been described.

1. Technology will make it easy to use for most drivers.
2. Its parking is almost always shared, to support mixed uses.
3. It unbundles cost by charging and having earnings go to the parking beneficiaries.
4. Traditional groups, such as single-family home owners, employees, tenants, train riders, and students benefit from parking. The benefit is equal for drivers and non-drivers.
5. Baseline prices are computed primarily from the value of the parking and an agreed-upon rate of return. On-street parking is free until it is half full, at which time its base price often matches that of the closest off-street parking.
6. For all parking, price is dynamically increased to guarantee availability. Earnings are therefore only limited by what people are willing to pay.
7. Technology helps drivers find parking and decide if they want to drive or use transit.
8. Prepaid RFIDs provide service to those who have poor credit or don't want to be billed.
9. Disabled and perhaps low-income drivers will have accounts that allow them to park at reduced prices and perhaps avoid congestion pricing. Specially designated spots might also be required for disabled drivers.
10. The system will provide reports showing where additional parking would be a good investment and where it would be wise to convert existing parking to some other use.

11. Privacy will be protected. Law enforcement officials would need a search warrant to see where someone's car has been parked. The level of detail on billing would be selected by the car's owner.

12. Implementations could begin in carefully selected locations and expand.

Global warming, air pollution, trade deficits, and fairness are some of the significant reasons that governments have a responsibility to implement *Intelligent Parking*.

ACKNOWLEDGEMENTS

The following people have offered encouragement, specific information, and/or special insights.

Dr. Dennis Martinek, Oceanside Planning Commissioner; Sandra Goldberg, California Deputy Attorney General; Jerry Kern, Oceanside, City Council; Amy Volzke, Principal Planner, City of Oceanside; Dr. Nilmini Silva-Send, Senior Policy Analyst of the Energy Policy Initiative Center; Diane Nygaard, Director of Preserve Calavera and founder of Nelson Nygaard, Consulting Associates; Lisa Rodman, Trustee, Carlsbad Unified School District; Dr. Michael McQuary, President, La Jolla Democratic Club; Joan Bullock; Judy Jones, San Diego County Central Committee, California Democratic Party; Patrick Siegman, Principal and Shareholder, Nelson Nygaard; Andy Hamilton, San Diego Air Pollution Control District; Renee Owens, Conservation Chair, San Diego Sierra Club; Caroline Chase, Executive Committee Chair, San Diego Sierra Club; Ed Mainland, Co-Chair, Energy-Climate Committee, Sierra Club California; Bern Grush, Chief Scientist, Skymeter Corporation; and the following San Diego Area Government (SANDAG) employees: Susan Baldwin, Senior Regional Planner; Bob Leiter, former Director of Land Use and Transportation Planning; Coleen Clementson, Principle Planner; and Stephan Vance, Senior Regional Planner.

REFERENCES

- 1 Siegman, P. *How to Get Paid to Bike to Work: A Guide to Low-traffic, High-profit Development; Pro Bike Pro Walk Resource Book*; from the Ninth International Conference on Bicycle & Pedestrian Programs; Sept. 3-6, 1996, Portland, Maine; Bicycle Federation of America Pedestrian Federation of America; pp 171-175.
- 2 Adams, T.; Eaken, A.; Notthoff, A.; *Communities Tackle Global Warming, A Guide to California's SB 375*, June 2009, NRDC; <http://www.nrdc.org/globalWarming/sb375/files/sb375.pdf>.
- 3 Anders, S. J.; De Haan, D. O.; Silva-Send, N.; Tanaka, S.T.; Tyner, L.; *San Diego County Greenhouse Gas Inventory*, September 2008. <http://www.sandiego.edu/epic/ghginventory/>
- 4 Silva-Send, N.; *Reducing Greenhouse Gases from On-Road Transportation in San Diego County*, October 2009. http://www.sandiego.edu/epic/ghgpolicy/documents/ES_GHG_Policy_On-Road_FINAL.pdf
- 5 Shoup, D. *The High Cost of Free Parking*. Chicago University Press, June 7, 2005.

KEYWORDS

A&WMA, Parking, Unbundled, Shared, TDM, cash-out, pricing, beneficiary, greenhouse gas, GHG, GPS, RFID

Michael Bullock
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July 27, 2011

Honorable President Richard Holober and
Members of the Board of Trustees
San Mateo County Community College District

Via E-mail

Subject: An Updated Parking Policy, in Light of the Controversy Surrounding the
Removal of Building 20, Greenhouse, and Gardens, to Add Parking

Dear President Holober and Trustees:

Please consider this unsolicited parking-policy proposal.

Allow Me to Introduce Myself

I am a retired satellite systems engineer. I worked for Lockheed Martin in Sunnyvale, for 36 years. I now live in north San Diego County, to be close to my two grand daughters. I also have a younger grandson in Walnut Creek. I volunteer my time to various environmental and political organizations, with some success. I am the 2011 Volunteer of the Year at a 14,000-member environmental organization here in San Diego County. I successfully amended the Platform of one of our two large California Political Parties with the following two bullets:

- Provide support for alternatives to driving, from bicycle education to high-speed rail;
- Work for equitable and environmentally sound road and parking use

In the same party (I think you have to pick one), I authored a resolution on Battery Electric Vehicles. As you might guess, I am very concerned about global warming.

I feel that I will always be a systems engineer. Last summer, after many rejections, I finally had my car-parking policy paper peer-reviewed and published by a prestigious organization.

Topic Introduction

The purpose of this letter is to describe and advocate for a parking policy change that would increase fairness and choice while it simultaneously results in smarter, healthier students and employees. It would also reduce driving. I assume you want plenty of parking. However, as you will see, this policy change will result in a drop in driving sufficient to allow for a decrease in needed parking of at least 15%

Reference 1 describes a policy that will efficiently and conveniently unbundle the cost of parking in all circumstances. It is available at the following URL: http://www.moderntransit.org/parking/Modern_Transit_Society.html.

However, the system described herein requires fewer features. Features not needed are congestion pricing, price predictions, and policies unique to on-street parking.

Two assumptions allow the elimination of these features. First, it is assumed that there will be an adequate supply of parking, so no congestion pricing is needed. Since the price will be fixed, no price predictions are needed. It is also assumed that students and employees can be successfully required to park only at the school. Therefore there is no need for new, on-street parking policies, designed to protect adjoining neighborhoods from the intrusion of additional parked cars.

For employees, the policies in this paper can still be described as “unbundling the cost of car parking”. Parking is expensive to provide. Therefore, if no parking had been provided, the saved money could have been invested to increase employee salaries. The methods described in this paper allow employees to gain some of that lost salary back, by driving less. The status-quo policy of charging nothing to use the parking is only beneficial to those employees that would drive every single day, even if they were given a method to recover some of the lost salary. The employees that would choose to drive less, to recover some of their lost income, are being treated poorly by charging nothing. With this policy, the employees are shown the value of their parking and are given the ability to recover some of their lost salary, by parking less than every single day.

For students, the policy is better described as “extending the parking lot benefit to all students, regardless as to how often they choose to use the parking”. It could also be described as “equalizing the parking-lot benefit”, for all students.

Methods

The parking is operated on the behalf of the students and employees, as if it were their business. Students and employees that choose to use the parking are therefore their own customers.

Earnings (net revenue, minus the cost of collection and distribution) are given to students and employees in proportion to the time they spend at the school. This could be based on their schedule or, to be more precise, could be based on the data collected using personal radio frequency identification units (RFIDs) and detectors that are tied to a central, implementing computer. The algorithm used to compute the amount of money given to a student or to an employee is shown on Slides 18, 19, and 20 of Reference 2. Drop-off policy is described on Slide 23 of Reference 2.

Charge for parking is per unit time. A charge rate that is acceptable to all must be established. For example, if sixty cents per hour is selected, the charging software could round off the parking duration time to the minute and apply a one-cent-per-minute charge. The method could be implemented with RFID's on cars being detected at campus entrances and exits. The collected data is supplied to the implementing computer.

Parking statements are automatically sent out monthly, showing the individual's charges and earnings. This is shown on Slide 21 of Reference 2.

Implementation

A San Diego vendor has stated that both the design and the installation of a fully-automated system would be easy to perform. This is shown on Slide 22 of Reference 2, where the vendor is identified, with all of his contact information. Since this is a new system, it would be prudent to contract with the vendor so that the vendor also operates the system for the first 10 years. This arrangement would ensure that the vendor would fully debug the system and continue to look for operational efficiencies over the 10 year period. The vendor could operate the system for 10% of the revenue, for 5 years; 5% of the revenue, for 3 years, and 2% of the revenue for the final 2 years. If it is assumed that, on average, 6000 cars are parked for 8 hours, for 200 days per year, at a rate of 50 cents per hour, then the yearly revenue would be \$4,800,000 per year. The vendor would therefore collect \$2,400,000 over the first 5 years, \$720,000 over the next 3 years, and \$288,000 over the last two years.

Advocacy

Table 1 shows that even high schools are starting to charge significant prices for parking. It should be noted that the method described here is much more than just "charging for parking", because the earnings are given back to the students and employees.

Table 2 shows that introducing a price differential into the choice of how often to drive will decrease the amount of driving. This table is the basis for my assertion, in the *Introduction*, that this policy change would result in a drop in driving sufficient to allow a decrease in needed parking of at least 15%. The smallest decrease shown in Table 2 is 15%. Given the problems you have had trying to generate increased parking, I am sure you recognize the value in needing 15% less parking. If the baseline amount of parking happened to be 8000 cars, 15% would be 1,200 spaces. Since only about 120 cars can be parked on an acre of surface parking land, this would equate to 10 acres. An acre of land in the Bay area is generally worth several million dollars. Therefore, the 15% reduction could easily yield land worth \$20 million dollars.

S-3-05 is a California Governor's Executive Order to drop Year 2020 levels of greenhouse gas (GHG) to the level of 1990 emissions and to drop our Year 2050 level of GHG to 80%

below 1990 levels. If the world achieves similar reductions, the earth's level of atmospheric CO2 will be capped at 450 parts per million (PPM). Figures 1, 2, and 3 show how large 450 PPM is, compared to values over the last 800,000 years. Reference 3 shows that the goal of S-3-05 is to limit atmospheric CO2 to 450 PPM and it also shows that even if this cap is achieved, the risk of a human catastrophe caused by global warming is significant. Reference 4 shows that decreasing the amount of driving is necessary to achieve the GHG reductions of S-3-05. This is stated on Page 9 of Reference 4 and is illustrated in Figure 1 of Reference 4. Reference 4 shows that, using the best assumptions about the future efficiency of California's fleet of cars and light-duty trucks, a significant reduction in driving is critically needed.

Table 1 American High Schools that Charge for Parking

| Eleven U.S. High Schools that Charge Students to Park | | | | | | |
|--|---------------|---------------|---------------------|-----------------------|---|---|
| State | City | County | High School | Price Per year | Link to Price | Link to Location |
| California | Anaheim | Orange | Servite | \$25 | http://www.servitehs.org/apps/pages/index.jsp?uREC_ID=86492&type=d | http://en.wikipedia.org/wiki/Anaheim, California |
| Illinois | Maple Park | DeKalb | Kaneland | \$150 | http://www.kaneland.org/khs/ | http://en.wikipedia.org/wiki/Maple Park, Illinois |
| Minnesota | Andover | Anoka | Andover | \$100 | http://www.anoka.k12.mn.us/education/components/docmgr/default.php?sectiondetailid=276465&fileitem=96679&catfilter=24892 | http://en.wikipedia.org/wiki/Andover, Minnesota |
| Wisconsin | German Town | Washington | German Town | \$150 | http://www.germantownnow.com/news/92202694.html | http://en.wikipedia.org/wiki/Germantown, Wisconsin |
| Virginia | Herndon | Fairfax | Herndon | \$200 | http://www.fcps.edu/HerndonHS/stud_life/park_reg.htm | http://www.fairfaxcounty.gov/ |
| North Carolina | Holly Springs | Wake | Holly Springs | \$153 | http://hollyspringshs.wcps.nc.edu/Parking/HSHS%20PARKING%20REGULATIONS%202010-2011.pdf | http://en.wikipedia.org/wiki/Holly Springs, North Carolina |
| New Jersey | Newton | Sussex | Kittatinny Regional | \$50 | http://www.krhs.net/new08/ActivityFees.pdf | http://en.wikipedia.org/wiki/Newton, New Jersey |
| Massachusetts | Ipswich | Essex | Ipswich | \$50 | http://www.wickedlocal.com/ipswich/news/x1146471597/Student-parking-fee-set-override-nixed#axzz1Qy0d7dfi | http://en.wikipedia.org/wiki/Ipswich, Massachusetts |
| Massachusetts | Andover | Essex | Andover | \$200 | http://www.aps1.net/DocumentView.aspx?DID=1409 | http://en.wikipedia.org/wiki/Andover, Massachusetts |
| Massachusetts | Palmer | Hampden | Palmer | \$100 | http://www.masslive.com/news/index.ssf/2009/09/school_committee_defends_100_p.html | http://en.wikipedia.org/wiki/Palmer, Massachusetts |
| Connecticut | Stonington | New London | Stonington | \$100 | http://www.thewesterlysun.com/mysticriverpress/news/school-board-plans-parking-fees-reassignment/article_d72199e4-9d9f-11e0-8406-001cc4c03286.html | http://en.wikipedia.org/wiki/Stonington, Connecticut |

Table 2

Eleven Case of Pricing Impact on the Amount of Driving

| Impact of Financial Incentives on Parking Demand | | | |
|---|----------------------------------|----------------------|-----------------------------------|
| Location | Scope | 1995 dollars per mo. | Parking Use Decrease ¹ |
| Group A: Areas with little or no public transportation | | | |
| CenturyCityDistrict, West Los Angeles | 3500 employees at 100+ firms | \$81 | 15% |
| Cornell University, Ithaca, NY | 9000 faculty & staff | \$34 | 26% |
| San Fernando Valley, Los Angeles | 1 employer, 850 employees | \$37 | 30% |
| Costa Mesa, CA | | \$37 | 22% |
| Average for Group | | \$47 | 23% |
| Group B: Areas with fair public transportation | | | |
| Los Angeles Civic Center | 10000+ employees, several firms | \$125 | 36% |
| Mid-Wilshire Blvd., Los Angeles | 1 mid-size firm | \$89 | 38% |
| Washington DC Suburbs | 5500 employees at 3 worksites | \$68 | 26% |
| Downtown Los Angeles | 5000 employees, 118 firms | \$126 | 25% |
| Average for Group | | \$102 | 31% |
| Group C: Areas with good public transportation | | | |
| University of Washington, Seattle Wa. | 50,000 faculty, staff & students | \$18 | 24% |
| Downtown Ottawa, Canada | 3500+ government staff | \$72 | 18% |
| Bellevue, WA | 1 firm with 430 employees | \$54 | 39% ² |
| Average for Group, but not Bellevue Washington | | \$45 | 21% |
| Over All Average, Excluding Bellevue Washington | | | 25% |

¹ Parking vacancy would be higher! ² Not used, since transit & walk/bike facilities also improved.

Figure 1 Atmospheric CO2, Increasing Over Recent Decades

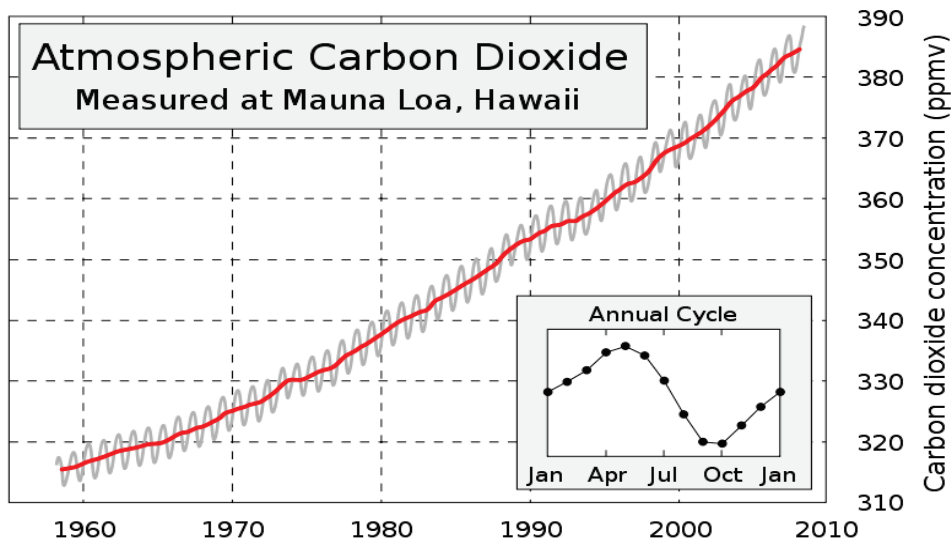


Figure 2 Atmospheric CO₂ and Mean Temperature, 800,000 Years Ago, with 450 PPM CO₂ Shown

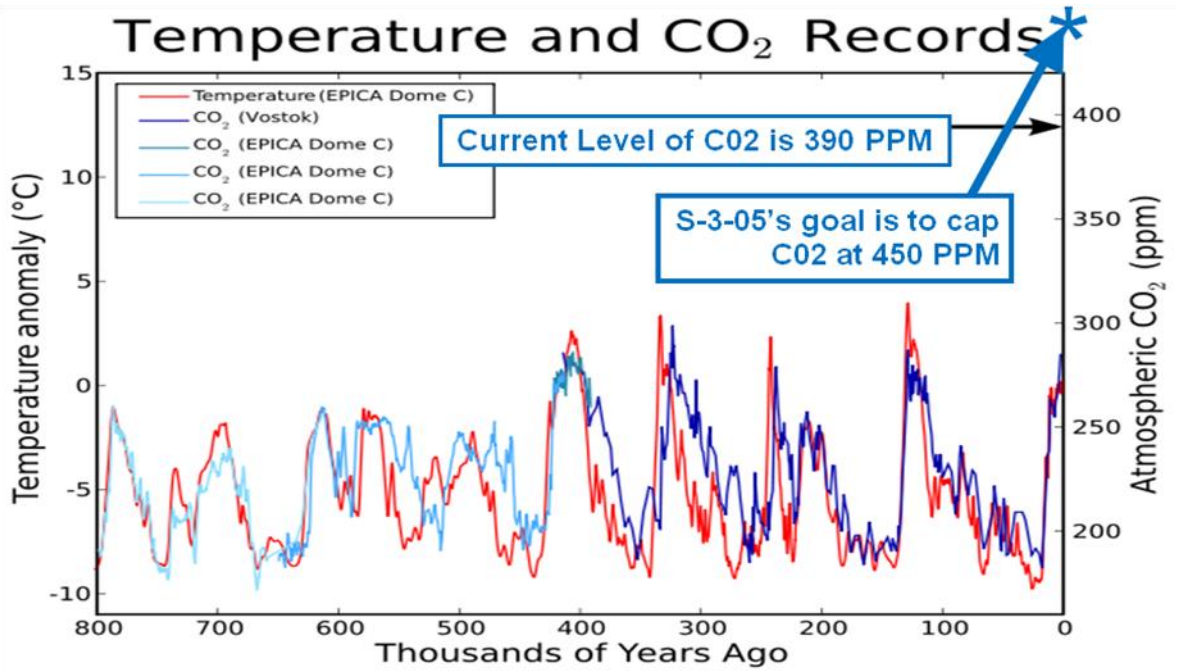
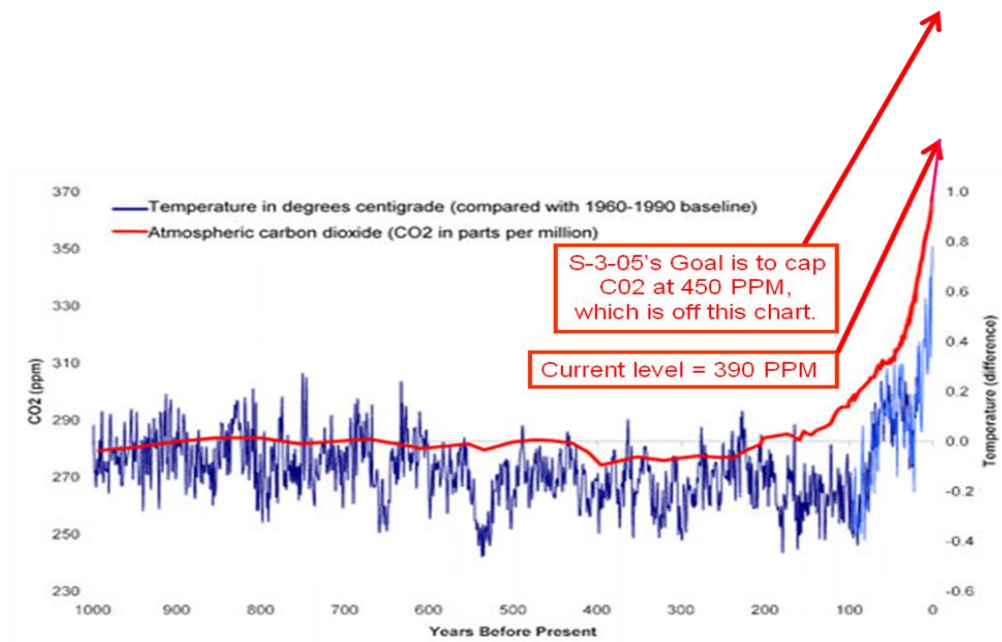


Figure 3 Atmospheric CO₂ and Mean Temperature, Over the Last 1,000 Years



Conclusion

As shown in the above section, decreasing the amount of driving is critical to human survival. School Boards are government entities. The first job of all government entities is health and safety.

Adopting this program will help the students gain an understanding of economics and technology. If they understand the harsh realities of global warming, they will have a deep sense of gratitude for this program, as well as a life-long feeling of school pride for San Mateo College. Students will be grateful that the future of any children that they might have will be significantly improved by this pioneering effort. It is a demonstration of the fundamental features of Reference 1. It will set an example for other schools and employers. It will let the world know that the United States has leaders that understand the climate crisis and are willing to take the bold measures needed to help avert disaster.

Please do not hesitate to contact me with questions or comments.

Respectively submitted,

Mike Bullock



760-754-8025

Retired Satellite Systems Engineer, 36 years

Co-author, "A Plan to Efficiently and Conveniently Unbundle Car Parking Cost"

References

- 1.) *A Plan to Efficiently and Conveniently Unbundle Car Parking Costs*, Paper 2010-A-554-AWMA of the proceedings of the 103rd Conference and Exhibition of the Air And Waste Management Association; Mike R. Bullock and Jim R. Stewart, PhD; presented on June 22nd, 2010. Also available at [http://www.moderntransit.org/parking/Modern Transit Society.html](http://www.moderntransit.org/parking/Modern_Transit_Society.html)
- 2.) *CarlsbadHS2010_2.pdf*, a "pdf" file of a Power Point file created in 2010, Mike Bullock. Available upon request from Mike Bullock, mike_bullock@earthlink.net
- 3.) Letter from *Center for Biological Diversity*, to Elaine Chang, Deputy Executive Officer of Planning, Rule Development, and Area Sources of the South Coast Air Quality Management District; *Comments on Survey of CEQA Documents on Greenhouse Gas Emissions Draft Work Plan and Development of GHG Threshold of Significance for*

Residential and Commercial Projects; April 15, 2009. Available upon request from Mike Bullock, mike_bullock@earthlink.net

4.) *Communities Tackle Global Warming*, Tom Adams (California League of Conservation Voters), Amanda Eaken, and Ann Notthoff (Eaken and Notthoff are employees of the Natural Resources Defense Council); June 2009. Available at <http://www.nrdc.org/globalwarming/sb375/files/sb375.pdf>