California’s Low Carbon Road Program

Session 7C: Reducing the Carbon Footprint
California Global Warming Solutions Act of 2006

- A multi-year program to reduce CA GHG emissions to 1990 levels by 2020
What is a Million Metric Tons of CO₂ Emissions?

How big is a ton of CO₂?

A ton of CO₂ would fill a modest one story ranch house with a footprint of 1,250 square feet and an average height of 13 feet.
Top 10 Countries by CO₂ Emissions from Consumption of Energy (2009)

©2011 Dan Witkowski for “Ranking America”  http://rankingamerica.wordpress.com
Per Capita CO₂ Emissions by State

Emissions per capita in metric tons of carbon dioxide (2011)
Source: U.S. Energy Information Administration, US. Census state population estimates, 2011
Graphic: Dave Merrill, Bloomberg Visual Data
California Global Warming Solutions Act of 2006

- Key strategy to achieve this goal is a ‘cap and trade’ market system.
- The ‘cap’ creates a limit on carbon dioxide equivalent emissions; a corresponding number of allowances within the cap can be ‘traded.’
- The allowances are purchased at quarterly auctions.
- The auction proceeds are then used for climate investments.

How California’s cap-and-trade will work

Rather than having a strict government mandate, like a carbon tax, to reduce pollution, a cap-and-trade system uses market mechanisms to reward companies that figure out ways to reduce pollution below the level the government sets. California’s cap-and-trade rules, which will affect oil refineries, power plants and large factories, take effect Jan. 1.

1. Starting in 2013, a statewide cap on greenhouse gases will be put in place. It will drop each year by 2 to 3 percent.
2. Industries must obtain a permit, known as an “allowance,” for every ton of carbon dioxide and other greenhouse gases they emit.
3. As the cap goes down, companies must decide each year how they will get enough allowances to cover their emissions. Their choices: Operate more efficiently, burn less fossil fuel, or buy allowances from another company.
4. Sacramento makes money by holding an electronic auction four times a year to distribute the pollution allowances. At first, 90 percent will be given away free and 10 percent auctioned for sale. By 2020, 50 percent will be auctioned. The state will make $2 billion to $14 billion a year, depending on the demand for the allowances.

Source: Mercury News reporting
Innovating Through Informatics™

Cap & Trade

What does it mean for my community?

- Cap and trade allowances generate $2-$3 BILLION / year
- 60% of annual GGRF revenues are “continuously appropriated” by the Legislature to a variety of state programs
- 40% of revenues are subject to annual legislative appropriation through the state budget

For program details: www.ca-ilg.org/capandtrade

*Continuous appropriations
Cap and Trade

Low Carbon Road Program

$100 million Cap and Trade for Caltrans to implement a new Low Carbon Road Program for local projects that encourage active transportation such as bicycling and walking, and other carbon-reducing road investments, with at least 50% of the funds directed to benefit disadvantaged communities.
California’s Low Carbon Road Program

Eligible investments include, but are not limited to, those that do the following:

**Low Carbon Transportation and Infrastructure**
- Reduce GHG emissions through the development of state-of-the-art systems to move goods and freight, advanced technology vehicles and vehicle infrastructure, advanced biofuels, and low-carbon and efficient public transportation.

**Strategic Planning for Sustainable Infrastructure**
- Reduce GHG emissions through strategic planning and development of sustainable infrastructure projects—including, but not limited to, transportation and housing.
ITS:
The Other Carbon Reducing Road Investment
ITS: The Other Carbon Reducing Road Investment

- **Eco-Traffic Signal Timing**
  - AERIS program has shown that there is 1%-5.5% energy savings and that the application is effective in most conditions other than full saturation.

- **Eco-Approach and Departure at Signalized Intersections**
  - AERIS program has shown that there is a 2%-7% energy savings for all vehicles and that the application is less effective when the corridor is congested.

- **Eco-Traffic Signal Priority**
  - AERIS program has shown that there is a 1%-4% energy savings for all freight vehicles and a 1%-2% savings for transit vehicles.

- **TSM&O**
  - Traffic signal synchronization
  - Transit / Freight signal priority
  - Bicycle detection at traffic signals
ITS:
The Other Carbon Reducing Road Investment

“Are my detectors working?”
Number of phases in recall because of failed detectors

Corridor:

California “Low Carbon Roads”?  

Posted by Richard Masoner on January 7, 2016

California Governor Jerry Brown announced his proposed 2016-2017 state budget today. Brown’s $122.6 billion budget includes $11.6 billion for transportation spending, include $100 million from cap and trade funds for a new program called “Low Carbon Roads.”

A joint press release from California Walks, the Safe Routes to School National Partnership, Transborg, and the California Bicycle Coalition warns that “carbon-reducing road investments” include street improvements like traffic signal synchronization and wider lanes that offer little to active transportation road users while increasing road capacity. Infrastructure spending to improve traffic throughput typically result in an increase vehicle miles traveled — that’s transportation planner jargon for “more traffic.” California Bicycle Coalition notes that spending carbon tax moneys on road “improvement” projects is an illegal use of climate funds because they ultimately lead to an increase in greenhouse gas emissions.
The problem with this Low Carbon Roads proposal is that the “other carbon-reducing road investments” remain undefined. After all, some recently passed regional plans consider the addition of new highway toll lanes a better way to reduce carbon emissions than supporting active transportation.

Traffic light synchronization, for example, has been included in past discussions of what might constitute a “low-carbon road.”

Signal synchronization is designed to smooth traffic flow by decreasing the number of stops a vehicle has to make. For some reason, the notion that smoothing out traffic speeds can reduce greenhouse gas emissions just won’t go away. But what these proposals don’t acknowledge is that reducing congestion by building roads is actually impossible, because improving roads, in the end, just results in more driving. Which means that improving roads will not decrease greenhouse gas emissions, and therefore the GGRF cannot legally be used to fund programs that focus on improving traffic flow.

SENATE COMMITTEE ON ENVIRONMENTAL QUALITY
Senator Jerry Hill, Chair
2013-2014 Regular Session

BILL NO: AB 1447
AUTHOR: Waldron and V. Manuel Pérez
AMENDED: June 12, 2014
FISCAL: Yes
URGENCY: No
HEARING DATE: June 25, 2014
CONSULTANT: Karen Morrison

SUBJECT: CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006: GREENHOUSE GAS REDUCTION FUND: TRAFFIC SYNCHRONIZATION
Let’s Get Beyond the Confusion of what Signal Synchronization is…

COMMENTS:

1) Purpose of Bill. According to the author, this bill “adds Traffic Signal Synchronization to list of eligible for funding under AB 32 […] as it is proven to reduce greenhouse gas emissions drastically.”

2) Traffic signal synchronization. Traffic signal synchronization is a traffic Management and Operations process designed to maintain planned capacity, safety, and environmental quality along streets. Traditionally, traffic lights adhere to a fixed light cycle over a set period of time. For example, a traffic light may have one complete light cycle during the day that lasts 90 seconds, and a second cycle at night that lasts 60 seconds. Although industry guidelines call for retiming traffic signals every three years, or sooner depending on the pace of development, 2012 National Traffic Signal Report Card documented an overall rating of D+.

Traffic signal synchronization allows for efficient and stable traffic flow for all modes traveling the arterial highway system, including transit. Proponents of traffic signal synchronization claim that the process can maintain planned travel times, reduce vehicle stops and starts with more stable travel speeds, and reduce vehicle emissions and fuel consumption.
“There’s still a lot we don’t know about the induced-demand phenomena... Nonetheless, highway critics have taken fairly firm positions on the issue, using past research to shoot down any and all road proposals. To the degree past studies have been problematic, so has policy advice. Over the last several decades and in many corners of America, claims of induced demand have stopped highway projects in their tracks. This is wrong-headed.”
I-210 ICM Corridor

Extent of Study Area

Managed Freeway

Supporting Arterials

Innovating Through Informatics™
<table>
<thead>
<tr>
<th>Location</th>
<th>GHG Emissions (Metric Tons/Day)</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>Existing+TSS</td>
</tr>
<tr>
<td><strong>City of Pasadena</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citywide</td>
<td>2,893.16</td>
<td>2,891.69</td>
</tr>
<tr>
<td>All Intersections</td>
<td>25.06</td>
<td>25.00</td>
</tr>
<tr>
<td><strong>Total Citywide</strong></td>
<td>2,918.22</td>
<td>2,916.69</td>
</tr>
<tr>
<td><strong>Orange Grove Blvd (Columbia Street - Sierra Madre Villa Avenue)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corridor</td>
<td>56.96</td>
<td>61.64</td>
</tr>
<tr>
<td><strong>Fair Oaks Avenue (Columbia Street to Montana Street)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corridor</td>
<td>58.15</td>
<td>60.29</td>
</tr>
</tbody>
</table>

EMFAC Model Results
ITS & GHG Considerations

GREENHOUSE GAS (GHG) EMISSION REDUCTION EVALUATION PROTOCOL PROJECT

Draft Report

Submitted to:

Prepared by:
- Iteris, Inc.
- with
  - Terry Hayes Associates
  - NCGP, LLC
  - Dr. Matthew Barth
  - Spatial Information Group

1715-1731 | Iteris, Inc. July 8, 2016

- Citywide VMT increase (minor)
  - Approximately 0.1%
- Citywide GHG emission decrease (minor)
  - Reduction of between 1.0 and 1.5 metric tons/day, or 1.2 MMT/3 year cycle
  - Valued at $15,000 to $105,000 based on Cap & Trade allowance values of $12.73 - $90/MT
- Indicates maximum benefit from region-wide deployment with multiple components
  - Supports hypothesis: TSS + TSP + Bus Only Lanes = Greater GHG Reduction
Line 51
Corridor Delay Reduction & Sustainability Project