The Need for Accurate VMT and Fuel Assumptions in AB 32 Greenhouse Gas Land Use Sector Strategy Development: What is California's Likely VMT Growth Rate?

The California Air Resources Board (CARB) cites the high rate of VMT growth as the primary indicator of the need for land use strategies to reduce greenhouse gases (GHG) associated with Vehicle Trips (VT) and Vehicle Miles Traveled (VMT). At "nearly 3 percent per year," CARB projects that VMT will grow faster than population.

Further, reduction in VMT is proposed as a measure of greenhouse gas reductions. CARB anticipates that regions will receive a land use sector VMT/GHG reduction target.

Accurate information on historical and current VMT, fuel consumption and travel patterns is an important starting point for selecting appropriate GHG reduction strategies and targets. In the interest of reaching a sound and effective greenhouse gas strategy, this analysis revisits the topic of California's VMT growth rate, travel patterns and fuel consumption. In doing so, the following discussion presents information that contradicts CARB's base assumption that VMT will grow nearly 3% per year on average through 2030 within California.

CARB itself has recently noted at the May l9th Scoping Plan Workshop that passenger VMT growth is expected to average 1.2% per year between 2006 and 2020, and that freight VMT growth would be closer to 1.5% per year. This disparity with CARB's estimate of nearly 3% per year points out the urgency to validate VMT and fuel consumption assumptions before proceeding further with Scoping Plan strategies. It is important for all working groups developing various elements of the Scoping Plan and regulatory process to incorporate consistent and accurate VMT and fuel use growth predictions as the basis for their recommended strategies and targets.

This analysis has been prepared to help characterize the land use/transportation sources of GHG correctly, by exploring VMT and fuel assumptions related to land use targets for the Draft AB 32 Scoping Plan, scheduled for release in June 2008. Divergent federal, state and regional historical data and projections on VMT, travel patterns and fuel consumption must be examined and reconciled before land use targets are set in the Scoping Plan. Further, this analysis points out the dramatic impact that even slightly different VMT growth rates could have on Land Use Sector CO2 reduction targets. Finally, this paper recommends specific issues and assumptions that must be validated before setting the Land Use Sector GHG reduction target.

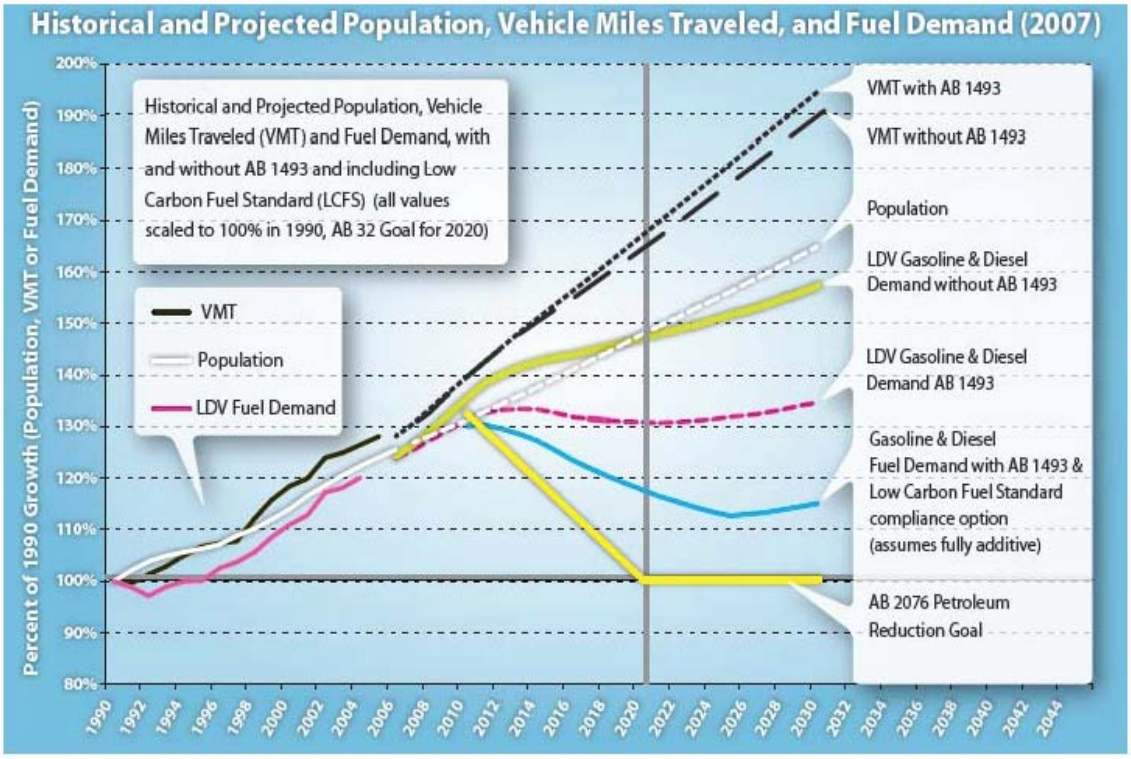
1. Divergent VMT Growth Assumptions

CEC, LUSCAT, CARB VMT Growth Projections: nearly 3% per year.

The California Energy Commission cites Caltrans estimates that VMT will "continue to increase at nearly 3% per year for the foreseeable future." (Source: CEC, "The Role of Land use In Meeting California's Energy and Climate Change Goals", page 9).

Land Use Sector Climate Action Team (LUSCAT) draft recommendations are also based on the assumption that California VMT will continue to grow at "nearly 3 percent" per year, a rate faster than population growth until 2030 and beyond, as depicted in the slide below. The California Department of Finance projects that the state's population will increase an average of 1.63% per year between l990 and 2030.

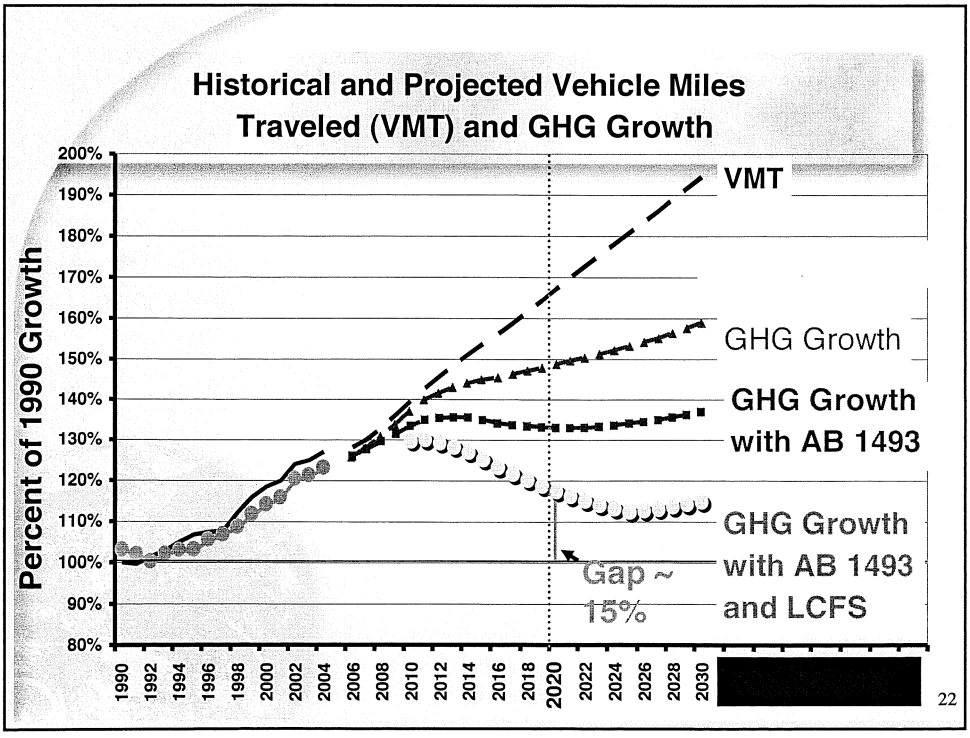
Exhibit 1



(Source: LUSCAT Submission to CARB Scoping Plan on Local Government, Land Use and Transportation. Draft, May 5, 2008)

CARB has also reiterated that VMT is expected to growth "nearly 3 percent" per year through 2030 in its AB 32 presentation graphics. CARB's graphic also clearly illustrates the central role CARB is assigning to VMT estimates. VMT measurements are the metric with which land use-related GHG improvements will be measured.

Exhibit 2



(Source: California Energy Commission, "The Role of Land Use in Meeting California's Energy and Climate Change Goals, page 17.)

National VMT Growth Projection: 1.92% per year

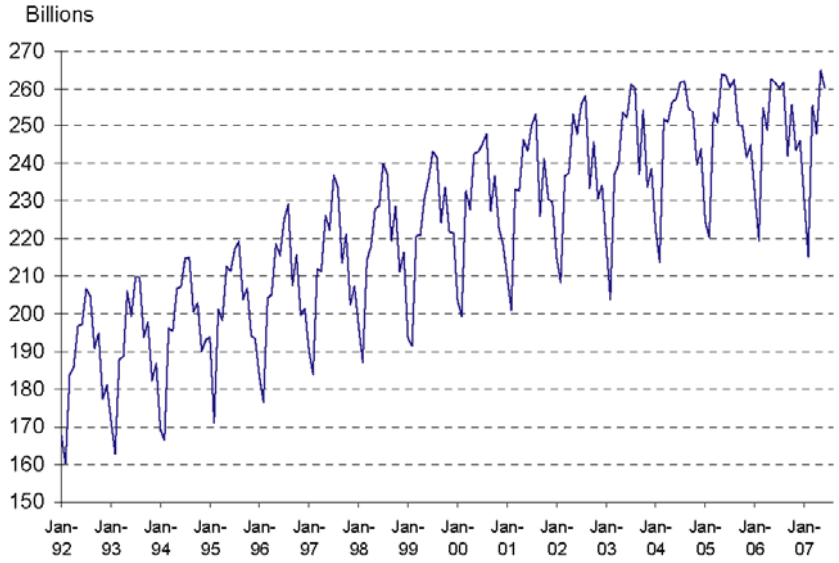
In "Growing Cooler," the Urban Land Institute cites Department of Energy projections that national VMT will grow 48% between 2005 and 2030, or an average of 1.92% per year. (ULI, Growing Cooler, page 4).

Further, in contrast to the nearly 3% per year VMT growth trajectory depicted in CARB's graphic, the federal Department of Transportation reports that the national rate of highway VMT growth has leveled off since the early 2000s, as the federal Department of Transportation chart below portrays. In fact, monthly data show that highway VMT growth experienced an absolute decline across the U. S. for the last two published years. June 2006 VMT was down .71% from June 2005, and June 2007 declined .5% from June 2006.

Exhibit 3

U.S. Highway Vehicle Miles Traveled

Highway Vehicle Miles Traveled (monthly data, not seasonally adjusted)



Vehicle miles traveled (VMT) are key data for highway planning and management, and a common measure of roadway use. Along with other data, VMT are often used in estimating congestion, air quality, and potential gas-tax revenues, and can provide a general measure of the level of the nation's economic activity.

Vehicle Miles Traveled	Jun-06	Jun-07
Highway miles (millions)	261,657	260,340
Percent change from same month previous year	-0.71	-0.50

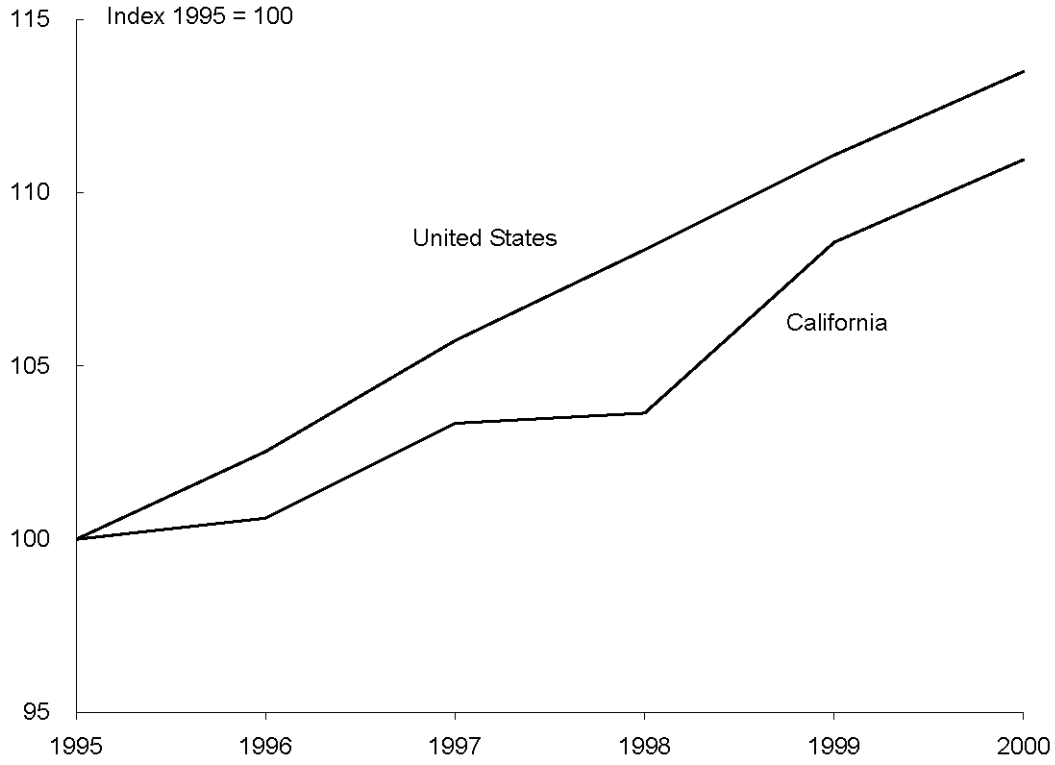
NOTE: The current value is compared to the value from the same period in the previous year to account for seasonality.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Office of Highway Policy Information, "Traffic Volume Trends", available at http://www.fhwa.dot.gov/, as of August 2007.

Notably, federal data also show that California's VMT growth trajectory has been below the national VMT growth rate for more than a decade. The U. S. Department of Transportation summarized this relationship in its graphic, Highway Vehicle-Miles Traveled, United States, and California:

Exhibit 4

Figure 5-1: Highway Vehicle-Miles Traveled, United States and California



SOURCE FOR DATA ON THIS PAGE: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics*, annual editions, available at http://www.fhwa.dot.gov/ohim/ ohimstat.htm as of Dec. 6, 2001.

Caltrans VMT Growth Projection: 2.8 % per year

The California Energy Commission cites Caltrans estimates that VMT will "continue to increase at nearly 3% per year for the foreseeable future." (Source: CEC, "The Role of Land use In Meeting California's Energy and Climate Change Goals", page 9). This trend is not supported by Caltrans published historical and projected VMT growth rates.

Since 2000, Caltrans historical VMT data mirror the federal data on the national decline in the VMT growth rate. California's 2006 VMT increased .3 % over 2005, and June 2007 increased 0% over June 2006. (Source: Caltrans. http://traffic-counts.dot.ca.gov/monthly/VMTHIST)

Taking a broader view, Caltrans historical VMT data show that VMT grew 31% between 1990 and 2007. While annual VMT met or exceeded 3% per year in two years (1990 and

2000), the annual average VMT growth over 17 years was 1.82% per year – 40% below the trend cited in CARB graphics and discussion of VMT trends. (Source: Caltrans. http://traffic-counts.dot.ca.gov/monthly/VMTHIST)

In the longterm, Caltrans' 2006 VMT forecast projects 113% VMT growth between l990 and 2030, or 2.8% per year on average. However, this projection, produced for purposes other than greenhouse gas reductions, relies on some key assumptions that are out of tune with current and projected conditions. For example, this "nearly 3 percent per year" VMT growth scenario assumes fuel costs will decline after 2006 counter to current and predicted fuel price trends. Further, registered vehicles are assumed to increase an average of 1.6% per year despite an aging driving population and higher fuel costs. (Source: Caltrans. Motor Vehicle Stock, Travel and Fuel Forecast. 2006)

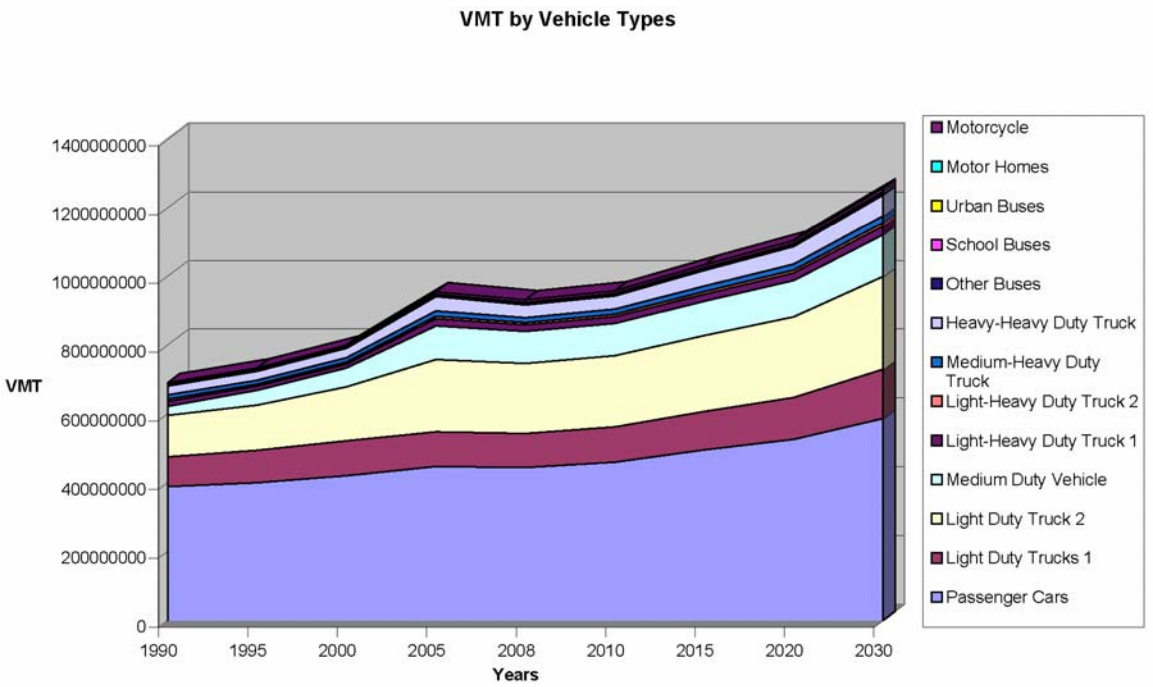
CARB EMFAC VMT Growth Projection: 2.05% per year

CARB prepares and maintains EMFAC, the emissions modeling tool that generates estimates of criteria pollutants, CO2 and methane. EMFAC 2007 is the latest version of this modeling tool, and is used broadly by the public and private sectors to estimate criteria pollutant emissions. EMFAC also has the capability to estimate CO2. A projection of VMT by vehicle type and fuel used is implicit in EMFAC 2007. EMFAC 2007 shows 82.1% VMT growth from l990 to 2030, an annual average of 2.05%.

Land use strategies available for passenger vehicles may be different than those for heavy duty trucks engaged in national goods movement. EMFAC also provides the ability to compare VMT growth for different vehicle categories in an effort to understand these dynamics. For example, the light duty passenger vehicle segment (not including SUVs and light duty trucks used for passenger purposes) shows 50% growth over the same forty year period, or and average of 1.27% per year.

The chart below illustrates EMFAC's projected VMT growth.

Exhibit 5



(Source: California Air Resources Board, EMFAC 2007.)

Metropolitan Region VMT Growth Projections: 1.26% to 1.37% per year

VMT trends in the SCAG region, which represents roughly half of the state's population, also differ from the CARB VMT trajectory that is currently being used as a basis for land use strategies and recommendations.

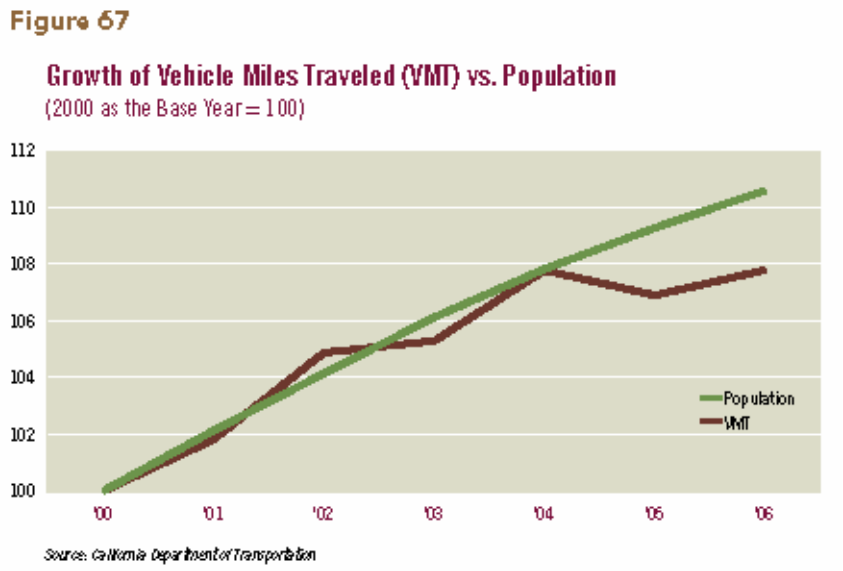
In two consecutive Regional Transportation Plans (RTPs), SCAG is showing population growthing at a greater rate than VMT, yielding a distinctly lower rate of VMT growth than CARB's assumption of nearly 3% per year. The 2004 RTP projects total daily highway VMT will increase 30.6% or an average of .98% per year between 2000 and 2030, while population increases 38.6% (average 1.29% per year) . The 2004 RTP projects that highway VMT per capita will decline from 21.89 to 20.65 miles daily VMT per capita between 2000 and 2030. This is a 5.7% decrease in per capita VMT. (Source: SCAG 2004 RTP, www.scag.ca.gov/rtp2004)

SCAG's new 2008 RTP is based on a new travel demand model that estimates highway and some arterial VMT. The absolute VMT will not be directly comparable to 2004 RTP VMT which does not include any arterial travel, but the rates of growth can be compared. SCAG's modeling shows that total daily VMT will increase by 27% or an average of 1.26% per year). Population will increase 27.2% during the same period, or 1.24% per year on average. (Source: SCAG Final Draft RTP, Transportation Conformity, pages 13 and 23. www.scag.ca.gov/rtp2008) Gasoline price increases, a trend toward shorter trips

due to infill development and increased density, and different driving habits of an aging population are plausible reasons for this shift, according to SCAG staff.

In addition, SCAG's 2007 State of the Region Report shows that VMT growth has been at or below the rate of population growth for the last five years. Only one year (2002) shows a rate of VMT growth greater than population growth since 2000. Caltrans VMT data --the same data source that reportedly undergirds CARB's projected nearly 3% per annum VMT growth trajectory -- also form the basis for SCAG's comparison.

Exhibit 6



(Source: SCAG. The State of the Region 2007, Figure 67: Growth of Vehicle Miles Traveled vs. Population, page 74. www.scag.ca.gov/sotr)

The trend toward declining VMT growth rates is also apparent in the Bay Area region. From 2000 to 2030, Bay Area VMT is projected to grow 41%, or an average of 1.37% per year. This is slightly higher than the projected population growth rate of 1.21% for the same 30 year period, but well below the nearly 3%per year VMT growth rate assumed by CARB based on CEC, Caltrans and MPO data. (Source: Metropolitan Transportation Commission. "Travel Forecasts for the San Francisco Bay Area, 1990-2030, Data Summary. January 2005)

Together, the SCAG and Bay Area regions comprise 68.2% of the California Department of Finance's estimated 2007 population, and 65.3% of its projected 2030 population. Therefore, the VMT growth trends cited above apply to the majority of current and future Californians. If SCAG and Bay Area region VMT grows at a rate of 1.26% and 1.38% per year respectively, then VMT in the remainder of California would have to grow in excess of 5% per year in order to reach an average of 3% per year VMT growth statewide. This

rate of VMT growth has not been supported by federal or state data, and appears less than likely given the cost of fuel and aging demographic structure.

2. The Critical Role of Fuel Assumptions

In the final analysis, how much fuel is consumed -- not VMT --will determine the amount of greenhouse gases released due to travel. Both Caltrans and SCAG have noted that fuel price is probably the most significant factor in determining the amount of travel and transportation fuel consumed in California.

Fuel price assumptions underpinning the VMT projections discussed above vary widely. For example, while gas prices at the pump continue to climb, Caltrans' 2006 VMT projections for the 2005-2030 period actually assumed that fuel prices would drop after 2006. (Source: Caltrans. 2006 Motor Vehicle Stock, Travel and Fuel Forecast, page 12.) If the fuel price assumption were adjusted to reflect the continued trend toward higher fuel prices, this would likely result in lower VMT growth statewide. Caltrans' is updating its VMT forecasts and assumptions in the 2007 report to be released in the near future.

Likewise, vehicle fuel efficiency assumptions vary. The number, type and fuel efficiency of vehicles assumed for California's future fleet will ultimately impact fuel consumption. For example, Caltrans' 2006 forecast did not reflect the latest national Corporate Average Fleet Economy (CAFÉ) standards enacted by Congress in 2007, which call for an average 35 miles per gallon by 2020 for new passenger vehicles, up from 27.5 miles per gallon assumed in the Caltrans forecast. The new CAFÉ standards will result in a 34% increase in vehicle fleet fuel economy by 2030. Further, the media are replete with reports on declining light duty truck and SUV sales, and climbing rail and bus ridership in the face of $4.00 per gallon gasoline. Vehicle mix and efficiency assumptions that underpin fuel consumption estimates must also be validated.

3. Next Steps Toward Validating VMT, Vehicle, Fuel Assumptions

Greater clarity on VMT assumptions and related issues is essential before the Draft Scoping Plan Land Use sector GHG reduction targets are set.

The VMT growth projections described above vary substantially. Only one of these federal, state or regional projections suggests a sustained VMT growth rate of nearly 3% for California. A difference of less than 1% per year compounded over 40 to 60 years would be cumulatively very significant in terms of greenhouse gas production projected for the Land Use Sector. Therefore, it is imperative that CARB, transportation and land use stakeholders reach consensus on the most likely VMT growth scenario for the state, based on clearly articulated fuel price, vehicle fuel efficiency, travel behavior and demographic assumptions.

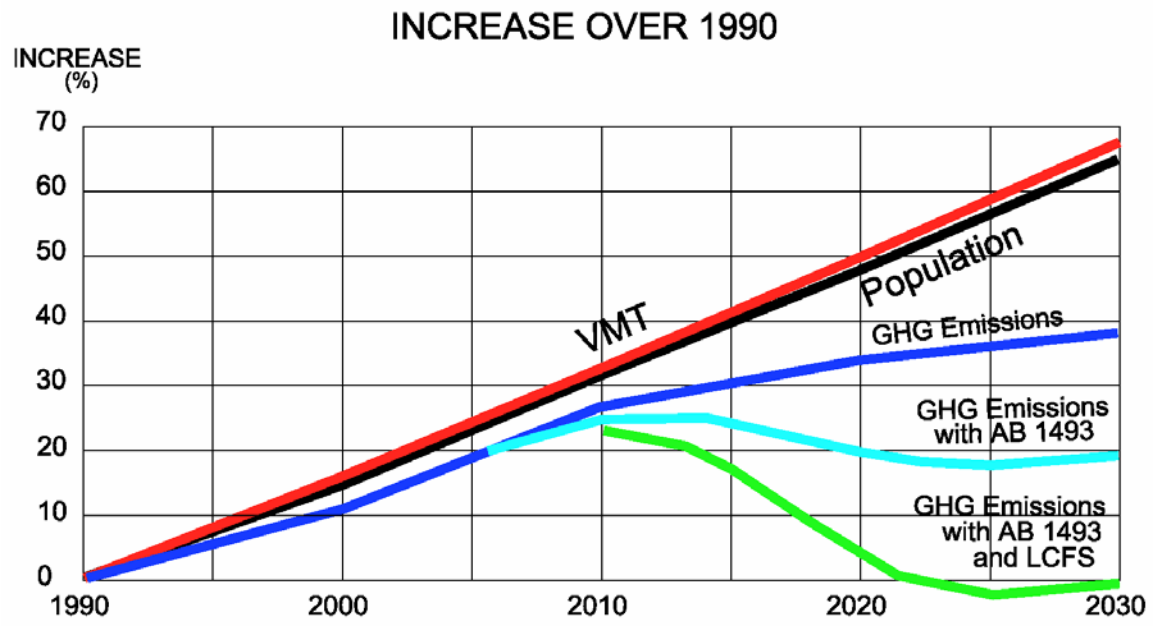
Exhibit 7

Summary of VMT Growth Rate Projections

DOE	1.92%	2005-2030
Caltrans	2.8%	l990-2030
EMFAC	2.01%	l990-2030
SCAG	1.26%	2008-2035
ABAG	1.37%	2000-2030

Exhibit 8 demonstrates the considerable difference that such assumptions have on policymaking. A 1.75% annual average VMT growth rate (1990-2030), rather than CARB's assumed nearly 3% per year depicted in Exhibit 1, results in the following graphic comparison of VMT trends and GHG reduction needs. The level of VMT growth in this example is still slightly above population growth and some of the sources cited earlier suggest that VMT per capita could even decrease over time. The important point from this example is that further reductions from the land use sector to meet l990 levels may be either minimized or unnecessary as a result of a lower rate of VMT growth in combination with greenhouse gas reductions expected from California's low carbon fuel and vehicle regulations . More accurate vehicle mix, fuel efficiency and fuel cost assumptions could close any remaining gap to reach l990 greenhouse gas levels associated with VMT.

Exhibit 8



(Source: Austin Foust Associates, Inc.)

Issues To Be Validated for the AB 32 Scoping Plan Land Use Sector Strategy

The need for consensus on VMT growth and fuel price assumptions argues for a white paper that explores and recommends options for resolving the following issues related to land use sector GHG reduction:

Establish and explain a consistent methodology for the state VMT baseline, and projecting growth from that baseline.

Describe how VMT growth projections are related to fuel consumption assumptions.

Validate the assumed rate of registered vehicle growth, along with the assumed mix of vehicle types and vehicle fuel efficiencies.

Explain how travel behavior differences between densely developed metropolitan regions with transit infrastructure, and less intensively developed areas in VMT growth projections will be incorporated.

Define how saturation of the transportation system will affect VMT growth, particularly in urban areas with little prospect of significant added road capacity.

Detail how VMT growth relates to population growth. For example, describe assumptions on how the state's aging population, particularly after 2010 will affect the number of trips, trip lengths, number of vehicles, vehicle type, and fuel expenditures.

Distinguish between VMT growth by passenger vehicles, buses, motorcycles, and trucks. Different vehicle classes experience different growth rates, some tied more directly to local land use than others.

Document the rationale for California's VMT growth, vehicle registration, fuel efficiency/consumption and fuel cost assumptions and compare with federal and independent estimates.

Detail how VMT projections and fuel assumptions will be used to generate CO2 projections for future years; compare the fit between EMFAC-based projections, VMT-based projections and fuel-based projections.