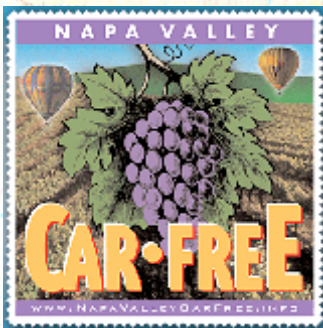


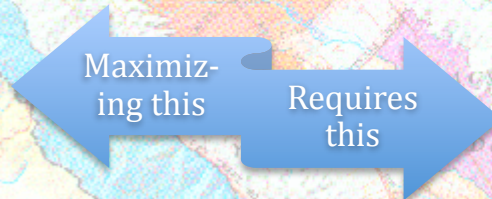
A White Paper

**A Modern, Comprehensive Public
Transit Network: The Key to
Sustainable Mobility for the Napa Valley**

May 2008



An American Viticulture Area (AVA) is created when any interested party formally petitions the Bureau of Alcohol, Tobacco, and Firearms to designate a specific geographic area as a unique viticulture area. Wineries can display approved AVA names on wine labels if at least 85 percent of the grapes used to make the wine were grown in the AVA indicated on the label.



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Downtown Napa in the 1930's



**A Modern, Comprehensive Public Transit Network:
The Key to Sustainable Mobility for the Napa Valley**

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Executive Summary

Introduction. The Brundtland Commission, created by the United Nations in 1983 and led by the former Norwegian Prime Minister Gro Harlem Brundtland, defined “sustainable development” as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.” In the Napa Valley, this means reducing our proportionate share of the negative impacts on climate change, energy depletion and numerous other environmental problems.

An increasing number of local businesses are “going green” in areas such as “LEED” green building standards, incorporating “green” sustainable practices into how their business operates, and other efforts to reduce environmental impacts and energy intensity. Non-profits are increasingly active in sustainability efforts, such as the Gasser Foundation’s “Sustainable Napa Valley” initiatives. Napa Valley vintners and growers are also at the forefront of sustainable farming practices and innovations. Local government and schools have also established sustainability initiatives including the St. Helena Climate Protection Task Force, Napa Valley College, and the County-wide sustainability goals adopted by the former Napa County League of Governments (a forum recently handed to the Napa County Transportation Planning Agency – NCTPA). Local governments and businesses also sponsor the visitor-oriented “Napa Valley Car Free” website:

Our principal goal for this website is to provide pre-trip traveler information to our visitors to the Napa Valley so they can plan their trip using viable transportation alternatives to driving a car. Like our motto, we want our visitors to the Napa Valley to “take a vacation from their car.” Our message is: Come and visit our beautiful valley, but please leave your car at home.

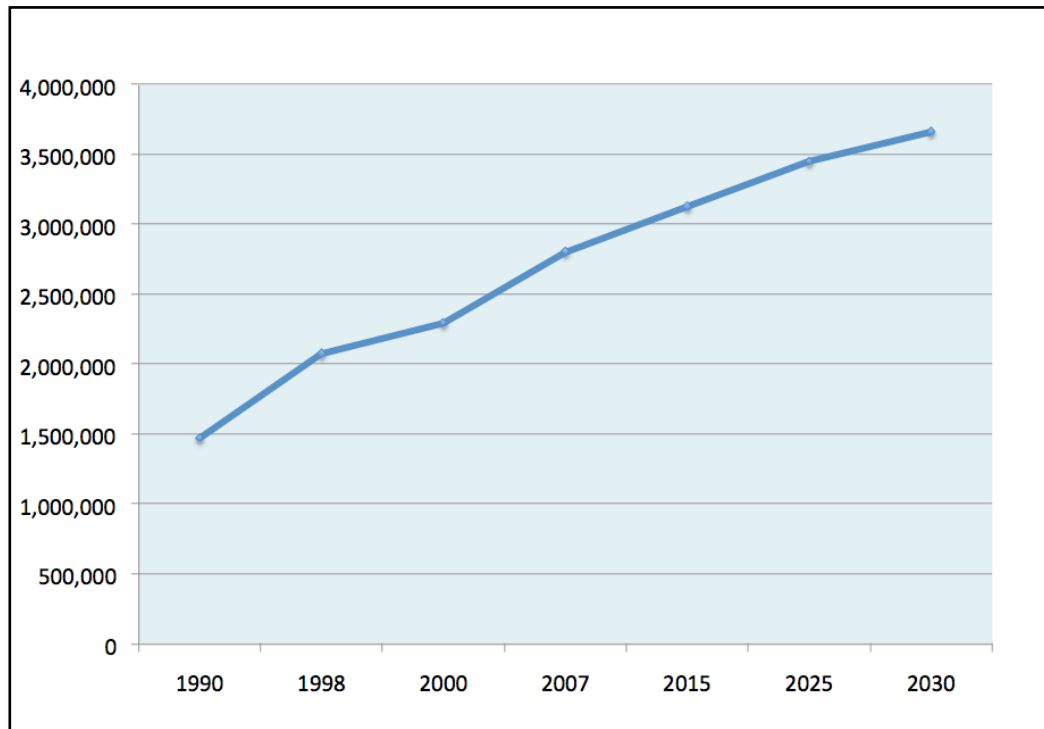
Sustainability vs. Traffic Projections. According to the Association of Bay Area Governments (ABAG), in 2002 Napa County contributed about 1.7% of the Bay Area’s annual 85.4 million tons of greenhouse gas (GHG) emissions. Of the estimated 1.4 million annual tons of GHG produced by Napa County, about 52% came from transportation including about 33% from personal vehicles.

In 2002 a daily average of 153,000 gallons of motor vehicle fuel was sold in Napa County, and 2.6 million daily vehicle miles traveled (VMT) occurred within the County. About 11 tons of GHG were emitted annually for each Napa County resident, of which an estimated 3.6 tons (33%) were from personal vehicles, an annual total of about 460,000 tons of CO₂.

In 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05¹⁰, which sets targets for reduction of California’s greenhouse gas (GHG) emissions as follows:

- ✚ Reduce California’s GHG emissions to 2000 levels by 2010;
- ✚ A reduction of GHG emissions to 1990 levels by 2020;
- ✚ And, a reduction of GHG emissions to 80% below 1990 levels by 2050.

Figure ES-1. Napa County VMT Growth, 1990 Actual – 2030 Projected



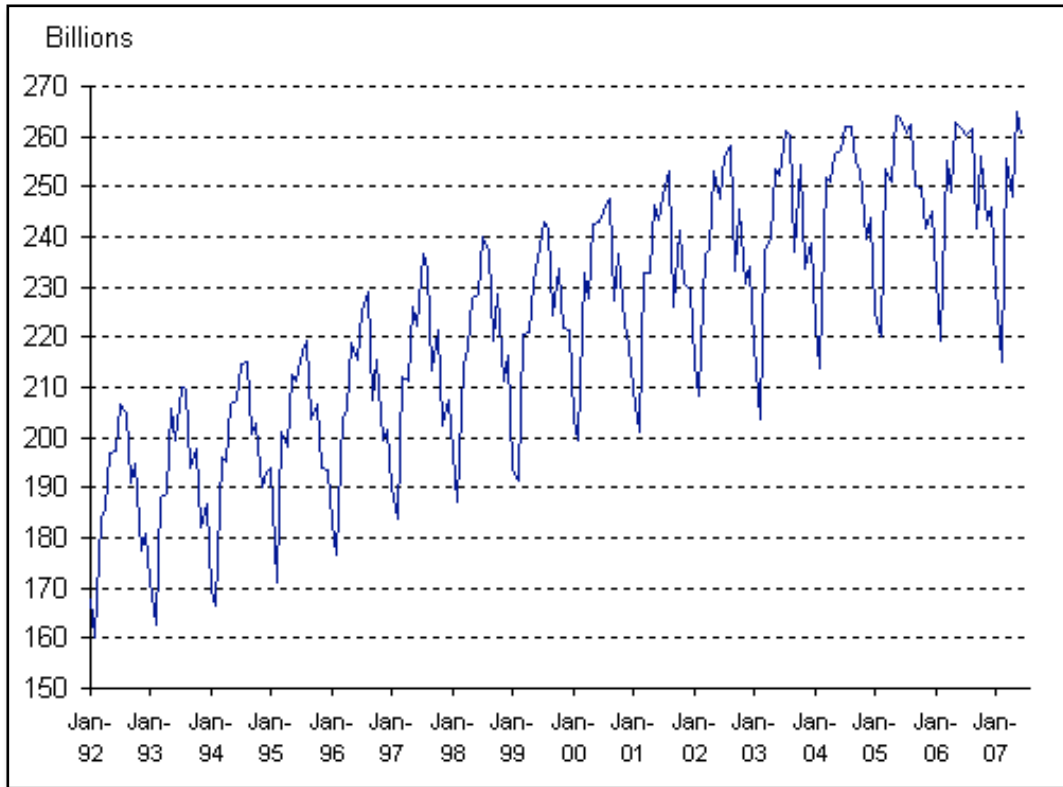
A reduction in personal transportation emissions in Napa County to 1990 levels by 2020, let alone 2030, appears problematic. In 1990 Napa County averaged 1.48 million daily VMT, emitting about 265,000 tons of CO₂ assuming a vehicle fleet average of 20 mpg at that time. Given the projected 2030 daily VMT that is 248% higher than 1990 VMT levels, reducing Napa County’s personal vehicle-related GHG would require either an increase to 50+ mpg, or a 40%-50% reduction in daily VMT based on the new Federal CAFÉ mpg requirements and the overall vehicle fleet mpg average in 2030.

Expectations have risen about the potential for hybrid and “pluggable hybrid” vehicles to dramatically reduce gasoline consumption and related GHG emissions. However, battery technical improvements are not proceeding nearly as quickly as many have hoped and many startup companies have hyped. The maker of the Prius hybrid, Toyota, has expressed doubts about lithium-ion batteries for hybrids, questioning “...battery cost, availability, performance and packaging.” Such technological setbacks lengthen the time for significant fuel consumption and GHG emission reductions, since replacing the entire U.S. personal vehicle fleet is expected to take at least 15 years.

Given the projected 2030 daily VMT that is 248% higher than 1990 VMT levels, reducing Napa County’s personal vehicle-related GHG would require either an increase to 50+ mpg, or a 40%-50% reduction in daily VMT based on the new Federal CAFÉ mpg requirements and the overall vehicle fleet mpg average in 2030.

High Gasoline Prices and Oil Depletion. Given that “technological fixes” are unlikely to solve the GHG emissions problem, there are some indications that the issue could be partially moot. Recent trends showing small declines in national VMT in 2006 and 2007, and the prospect of worldwide “peak oil” followed by a steady decline in worldwide oil

Figure ES-2. United States VMT Trends, 1992-2007 - "Peak Traffic?"



Highway Administration (FHWA), total vehicle miles traveled in June 2007 declined - 1.2% compared to June 2005. There has been essentially no VMT growth since 2005 due to dramatically increasing gasoline prices, and despite the addition of more than 2 million U.S. residents each year. It is possible that "peak traffic" has met "peak oil." In a 2003 article in the *Oil & Gas Journal*, the Association for the Study of Peak Oil (ASPO) predicted that conventional oil production would peak by 2010:

There is urgency, the agencies believe, to "make the world aware that the party is over," in the words of Kjell Aleklett, professor of physics in the Department of Radiation Sciences at Uppsala University. Aleklett started the Uppsala Hydrocarbon Depletion Group in January 2002. "The depletion of oil, which furnishes 40% of traded energy and 90% of transport fuel, should by all means be a sensitive subject for all governments as well as for you as an individual. It heralds for mankind a discontinuity of historic proportions," he warned.

In his 2006 book *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*, energy industry investment banker Matthew Simmons¹⁹ argues that oil production from Saudi Arabia would "...peak in the near future, if it had not done so already," according to Wikipedia. In a recent article, Simmons states:

My opinion is that it's increasingly likely that we actually set an all-time record in May 2005 of 74,252,000 barrels per day. And for the first three months of 2007, we're almost a million barrels per day behind that, and we're dropping fast. If that record still holds a year from now, I'll bet someone ten-to-one that we set peak oil in May 2005 and it's now past tense.

Market-Oriented Strategies to Reduce Congestion? While many increasingly worry about GHG emissions and the negative impacts on climate change, or are increasingly concerned about the specter of “peak oil,” others including the transportation leadership within the Bush Administration, worry about traffic congestion and the introduction of the private sector into the provision of highways and roads. Recently, Bush Administration Transportation Secretary Mary Peters stated:

We believe, however, that a failure to properly align supply and demand, not a failure to generate sufficient tax revenues, is the essential policy failure. When consumer demand determines supply, it will engender funding sufficient to meet the demand. The problem is not how to raise a certain level of revenue, but rather how to develop a policy framework that will unleash efficient capital investments, empower consumers, reduce congestion, stimulate technology improvements, improve America’s quality of life, and support the increased productivity of American businesses.






The broad policy failures we experience in these areas today are further exacerbated by a Federal-centric funding and regulatory structure that stifles creativity and innovation at the State and local levels. Yet a majority of our colleagues on the Commission urge as a central recommendation, an expansion of that very system. The Commission Report thus serves only to reinforce the misconception that substantially more Federal spending will improve America’s surface transportation system.

The views of Transportation Secretary Mary Peters are reinforced by Robert Poole, director of transportation at the Reason Foundation, a libertarian think tank:

*...The toll concession model is profoundly different. It says limited-access highways are businesses, which can and should be developed and run by investor-owned companies. Those companies charge users directly, in proportion to their use. **And they make decisions on the size, nature, and location of highways based on return on investment.** [emphasis added]. But because highways, like electricity and natural gas, have elements of monopoly and are also vested with various public interests, they are generally subjected to some form of public oversight (in this case, via enforcement of public-interest provisions included in the concession agreements). Thus, under the toll concession model, highways are an investor-owned network utility, like other network utilities.*

Since the adoption of the automobile by Americans a century ago, government roads have been considered a “public good” regardless of political viewpoint. [But] Unlike many public goods, the available capacity of roadways at any given moment is severely limited particularly during peak periods, and—as Secretary Peters and Robert Poole would point out—in the absence of road tolling and/or “congestion charges,” then scarce roadway capacity is rationed “first-come, first-served” through congestion and delays.

Roads have many impacts, good and bad, well beyond their commercial potential:

-  Providing an armature for transportation and commerce
-  Impacting land use and community character
-  Driving sprawl and private development patterns
-  Generating massive GHG emissions and energy use
-  Primary source of many other environmental problems

It is obvious if a \$5.00 toll were imposed each way on Highway 12 through Jamieson Canyon during peak periods, for example, traffic would flow much more smoothly and delays would mostly disappear. There is no doubt that such “clean” policy solutions to congestion would work, but are not generally acceptable to motorists and voters. Motorists would say that they’ve “already paid for the roads” through gasoline and other taxes, and instituting tolls on existing roads is a double charge.

While implementing tolls for the sole purpose of reducing congestion and placing public roadways in the hands of strictly private interests are much too narrow public policy goals except to those with strong libertarian views, increasing user fees on driving makes much economic and environmental sense. As transportation analyst Todd Litman points out in his October 2006 report *Smart Transportation Investments: Reevaluating the Role of Highway Expansion for Improving Urban Transportation*:

Such projects are only cost effective if they can be funded by peak-period users. Even based on proponents’ optimistic projections, highway expansion projects would cost \$200 to \$400 annually per urban commuter. When faced with such tolls motorists often prefer to shift route, mode or destination, so such projects cannot recover their costs. As a result, they would require funding from people who do not directly benefit, which is inefficient and inequitable. Described differently, traffic congestion results from market distortions that underprice driving and stimulate sprawl, resulting in economically excessive motor vehicle travel (“Market Principles,” VTPI, 2006). Under such circumstances, expanding highways cannot reduce long term congestion, and would increase other transport problems such as downstream congestion, parking demand, accidents, pollution emissions, sprawl, and inadequate mobility for non-drivers.

Alternative strategies can reduce traffic congestion and provide other benefits. Advanced modeling indicates that the most cost effective solution to traffic congestion reduction includes a combination of transit improvements, road pricing and smart growth land use policies. This is most efficient and equitable overall because it reflects market principles, including viable consumer options, cost-based pricing and more neutral public policies.

Unlike many public goods, the available capacity of roadways at any given moment is severely limited particularly during peak periods, and—as Secretary Peters and Robert Poole would point out—in the absence of road tolling and/or “congestion charges,” then scarce roadway capacity is rationed on a first-come, first-served basis through congestion and delays.

This is not to suggest that driving is bad or that highways should never be improved. However, when all impacts and options are considered, highway expansion is significantly more costly than advocates claim and provides less overall benefit than many alternative policies and programs.²⁷

Litman’s analysis raises several issues regarding future pricing of motor vehicle usage:

- ✚ Should per mile charges for road maintenance and construction be considered?

- ✦ Should bridge tolls across the Carquinez Straits be increased to improve intercity and regional rail service along the I-80 corridor and on “feeders” such as the Napa Valley Corridor?
- ✦ What about “charging admission” to the Napa Valley at all entry roads? A \$10 charge would generate over \$100 million annually; rebating 50% would be over \$400 annually per local resident, offsetting tolls paid except for local commuters not using alternatives to single-occupant automobiles.
- ✦ Should converting insurance charges from a fixed to variable cost be considered, e.g., charge by the mile? According to Litman, existing vehicle insurance at current prices and VMT is about \$0.08/mile. Another \$0.04-\$0.05 per mile would be needed to cover medical costs of accidents currently paid for by health insurance, not auto insurance according to Litman. Overall traffic would decline about 10%-15%.
- ✦ Returning paid parking to dense areas such as downtown Napa—where new garage spaces cost \$30,000+ each—should be considered. Also look at eliminating minimum parking mandates, particularly in commercial areas.
- ✦ “Carbon Tax Shift” - Should taxes on GHG emissions be added to gasoline and other motor fuels, with the resulting revenues shifted to reduce other taxes? (Carbon taxes have been endorsed by Al Gore).

Sustainable Mobility for the Napa Valley. During 2007 and early 2008, the Napa County Transportation Planning Agency (NCTPA) has been developing a new Strategic Transportation Plan for Napa County covering through 2035. NCTPA literature emphasizes the following critical issues directly impacted by the transportation system: (1) Maintain the agricultural character of the County; (2) Address Napa’s jobs/housing balance’ (3) Examine reducing congestion and promotion of better air quality by providing alternatives to single-occupant auto trips; (4) Minimize impacts on valuable habitat and productive farmland; and (5) Explore creative solutions for critical goods movement.

Based on the input received from a 14-member Citizens Advisory Committee and numerous stakeholder interviews, a series of tentative transportation strategies meeting the above-listed concerns have been developed.

For every passenger mile on transit, recent research shows that 2.1-2.2 personal vehicle VMT is replaced.

Personal motor vehicles are not going to disappear any time soon. However, as discussed in the previous section, transportation pricing strategies can support a wide range of sustainability policies in addition to the relatively narrow objective of reducing congestion. But obtaining sustainable mobility also goes well beyond pricing and economic tools. And while this paper argues that modern, comprehensive public transit built around rail is the key to sustainable mobility for the Napa Valley, “sustainable mobility” means also all existing and future alternatives to “drive alone,” e.g., walking, bicycles, ride-sharing, car-sharing, guaranteed ride home, paratransit, jitney services, taxi, public transportation and telecommuting.

Stakeholder and general public input obtained by NCTPA has generally been consistent in one area: the need for “walkability.” Whether walkability means “safe routes to school,” alternatives for seniors, well-located services, visiting the Napa Valley car-free, or changing the local culture regarding walking and bicycling, the central principle applied to bipedal species such as human beings is clear:

“Walkability” is the glue holding together all human activity, even if one is walking through our vast expanses of “drivable sub-urbanism.

Equally important, public transportation should mean “integrated community mobility” – that is, all transit modes connect at stops and facilities located near major trip destinations of both residents and visitors, near community services, that there’s a common information access point on the Internet or dialing 511, and a common “smart card” to pay for fares on any transit service, in addition to cash. Transportation is expensive in terms of both dollars and time, whether provided by personal vehicles, public transit, walking or bicycling.

Most of the proposed strategies in the NCTPA draft *Strategic Transportation Plan* are consistent with the concept of “sustainable mobility” for the Napa Valley. The benefits of sustainable mobility include:

- ✦ Freedom of mobility for those who cannot drive
- ✦ Freedom of mobility for those who can, but choose not to drive
- ✦ Provide a template for reinforcing sustainable “walkable urbanism” as previously mentioned, in existing communities and developing new walkable neighborhoods as needed. This means mixed use development around transit
- ✦ Divert demand for residential and commercial development away from the Agricultural Preserve, and reinforce the agricultural and other rural character of the Napa Valley and Napa County as a whole
- ✦ Increased prosperity and access to jobs and services for everyone, not just those who can afford a personal vehicle
- ✦ Easy, sustainable access to employees for employers
- ✦ Freedom from foreign oil and other polluting energy sources
- ✦ Gradual, sustained reductions in greenhouse gas (GHG) emissions
- ✦ Freedom from congestion and traffic

Figure ES-3. Proposed NCTPA Transportation “Supply Strategies” as February 2008

Description		Would the rail proposal discussed in the following section support strategy?
SUPPLY STRATEGIES		
Key Strategy A	Increase Transit Service and Ridership	Strongly Support – Rail is proven to attract 34% to 43% more passengers given same capacity offered as buses³²
Key Strategy B	Maintain Critical Street and Road Infrastructure	Support - Some pressure would be taken off road system as trips diverted
Key Strategy C	Invest in Strategic Road System Expansion in South County	Support - Could reduce some capital costs for capacity expansion based on diversion from personal vehicles
Strategy D	Encourage Development of Roundabouts	Perhaps – roundabouts in Oakville, Rutherford and other locations would increase safety of pedestrian travel to/from possible rail stops
Strategy E	Promote Freight Rail in South County	Strongly Support
Strategy F	Promote Energy Efficient and Environmentally Benign Systems	Strongly Support – For every passenger mile on transit, recent research shows that 2.1-2.2 personal vehicle VMT is replaced³³
Strategy G	Improve Road Safety	Support – Diversion of trips
Strategy H	Maintain Options for Future Rail	Strongly Support – Sooner than Later!
Strategy I	Provide Information Systems	Strongly Support – provide easy to understand transit trunk-line
Strategy J	Maintain Options for Water Transportation	Support – proposal station location in downtown Napa next to Napa River

Figure ES-4. Draft NCTPA Transportation “Demand Strategies” as February 2008

Description		Would the rail proposal discussed in the following section support strategy?
DEMAND STRATEGIES		
Key Strategy L	Workforce Housing Production Near Jobs	Strongly Support – Rail between Napa and Vallejo would provide “armature” that workforce housing can be built around while minimizing new traffic generation, e.g., up to 50% reduction
Key Strategy M	Promote City/Town Centers to Be Easily Navigated by Foot and Bicycle	Strongly Support – Rail between Napa and Valley would provide “armature” that existing “walkable urban” areas (e.g., downtowns) can be reinforced and new neighborhoods developed as needed ³³
Key Strategy N	Encourage Car-Free Tourism	VERY STRONGLY SUPPORT! – Rail option from Vallejo Ferry Terminal would attract far more visitor trips than any possible bus system, perhaps 4-5 times
Key Strategy O	Address Transportation Needs of a Growing Senior Population	Strongly Support – Rail stations would be focus of senior-oriented service and easy to use for costly longer trips, particularly if “low floor” level boarding provided
Key Strategy P	Encourage Alternatives for Commuting and Mid-Day Work Trips	Strongly Support – Rail generally attracts 34% to 43% higher patronage for a given level of capacity provided
Key Strategy Q	Promote Safe Non-Auto Routes to School, and After School Programs	Support – Applies particularly to schools and colleges near proposed rail stations
Strategy R	Change the Culture of Bicycling and Walking in Napa	Support – Trains provide more room to carry bicycles than buses, and would connect various “islands” of “walkable urbanism” around stations
Strategy S	Promote Well-Located Health and Social Service Delivery to Minimize Travel	Support – To the extent services not already in a given community are within easy walking distance in another
Strategy T	Discourage Single-Occupant Vehicles by Parking Disincentives	Strongly Support – Required parking can be minimized near stations, and an attractive transit service would provide alternatives to paid parking in the densest areas near stations

Sustainability, Drivability, Walkability and Rail. Contrary to much work produced by academics, some recent research from U.C. Davis bears a strong resemblance to reality. In general order, when people travel they tend to “like” walking, jogging and bicycling first, personal vehicles a close second, rail third, and buses a distant fourth. See Figure ES-5 for a survey of “travel liking” variables.

Figure ES-5. Short-Distance Travel Liking Variables, S.F. Bay Area (abridged)

Mode	Strongly Dislike	Dislike	Neutral	Like	Strongly like	TOTAL Neutral+
Walk/jog/Bicycle	4.0%	4.9%	24.4%	48.8%	17.9%	91.1%
Personal Vehicle	2.5%	9.2%	30.2%	47.6%	10.5%	88.3%
Rail	11.9%	17.0%	39.8%	28.3%	3.1%	71.2%
Bus	28.6%	34.8%	28.3%	7.6%	0.7%	36.6%

Source: Mokhtarian & Ory 2005. *When is getting there half the fun? Modeling the liking for travel.*
<http://repositories.cdlib.org/postprints/549>

That people like driving nearly as much as walking is not news. But unlike walking, jogging or bicycling, most people also know the act of driving is currently unsustainable. Developing “sustainable mobility” is strongly focused on mitigating the negative impacts of “sub-urban drivability” and development of alternatives acceptable to most people such as transit, walking and bicycling. While buses are a favorite sustainable mobility strategy among some transportation bureaucrats and some “social justice” advocates, they are severely limited in their likely success. Those who cannot afford to drive or cannot drive for other reasons constitute most VINE riders, for example.

Rail is strongly preferable to buses for many reasons:

- ✚ Figure 7 shows that 71% are “neutral” or more positive to rail, compared to 63.4% who “dislike” or “strongly dislike” the bus.
- ✚ Research on occupancies on trains and buses shows that given the same overall capacity offered, overall vehicle occupancies are 34% to 43% higher⁴¹. This is confirmed by historical analysis that independently found similar percentages.
- ✚ According to the public interest think-tank Reconnecting America, the six million U.S. households located within 0.5 mile of existing rail stations on average own 0.9 fewer automobiles saving 50-60 billion annual VMT, compared to than households more than 0.5 miles away. These figures correspond closely with estimates of reduced travel by personal vehicle attributable to the presence of rail transit by Bailey, Mokhtarian and Little.
- ✚ Rail has a much wider influence area than buses, due to demonstrated willingness to walk much farther than to bus stops, and up to 10.9 daily VMT reduced per household located within 0.75 miles of rail stations, versus only 3.3 daily VMT reduced per household located within 0.25 miles of bus stops.

Increasing Napa County’s per capita transit usage rates to the same level as East Contra Costa County would require quadrupling current expenditures on fixed route bus service to over \$20 million annually, and at least \$25 million annually including supplemental paratransit. The required fleet of 100+ full-sized buses, smaller buses and vans would require additional capital investment of around \$30-\$40 million for vehicles–100% renewed every 10-12 years–and \$20-\$25 million for expanded operation/maintenance facilities, since the current VINE facility on Soscol Avenue near WalMart is much too small for such a large fleet.

A rail strategy focusing on upgrading existing trackage is a much stronger and more cost-effective strategy than buses in the long term, particularly when it is considered **that rail stations could quickly become the armature around which existing Napa Valley “walkable urbanism” is reinforced and new walkable communities can be developed.** Rail is conducive to focusing development exactly because of its **fixed** nature, which is of particular importance to developers and businesses that crave predictability and stability in transportation and other services from local government.

Figure ES-6. Patronage Estimates based on Bailey, Mokhtarian and Little, 2008

Mode	Daily VMT Reduced	VMT Factor	Daily Transit Passenger Miles	Estimated Average Trip Length [@]	Estimated Daily Transit Boardings	Annual Boardings/ Capita
Rail	139,891	2.2	63,586	8.0 miles	7,950#	17.5
+ Existing Bus ⁴⁸	21,000	2.2	9,633	3.6 miles	2,700	5.9
Total	160,891	2.2	73,219	6.9 miles	10,650	23.4
Bus Only	81,840	2.2	37,200	5.4 miles%	6,900	15.2
Ratio of Total Rail/Bus to Bus Only Patronage					1.54	
[@] Proposed rail route is 18 miles from Vallejo Ferry Terminal to Wine Country Ave. Average trip lengths tend to be slightly less than 50% of line length. # plus 1,000 local Vallejo riders % allowing for more “corridor” trips						

Based on the calculations above, after residents had adapted to the new transit service, a combined bus/rail system could reduce daily VMT estimated in 2002 in Napa County by 6.2% In contrast, an expanded local bus system with roughly tripled service would reduce daily VMT by only 3.1%. Bus service could be expanded to match the performance of the combined rail/bus option, but this would require increasing existing VINE fixed route bus service by five- or six-fold.

The rail patronage estimate is consistent with the 2003 Napa/Solano passenger/freight study previously cited, MTC’s regional rail study⁵⁰ estimating 3,000+ daily passengers crossing the Napa/Solano County line (about 4,900 with 30-minute service using +0.62 elasticity for frequency, and allowing for trips within Napa County or within Vallejo). See also Setty and Demery, 2005: *Preliminary Patronage Forecast for a Napa/Solano Rail Transit Network, 2005*.

Recent research suggests that new housing in transit-oriented development (TOD) can produce up to 50% less personal vehicle traffic than locations away from transit⁵². Based on author estimates, most new housing built in Napa County by 2030 could be constructed around transit stations—assuming that a high quality transit service is actually in operation. ABAG estimates about 1% annual growth in Napa County, about the historical rate and a level that would produce 10,000-12,000 new housing units by 2030. **ABAG growth rate projections have been revised downward from previous years and now is generally consistent with local plans.** There is a sufficiently large supply of vacant land near suitable station sites to accommodate 60%-80% of this growth. This potential of an additional 4,600 to 7,400 new housing units near transit stations could reduce projected traffic growth between 61,000 and 88,000 daily vehicle miles traveled (VMT).

Sustainable Transit for Sustainable Mobility. The proposed "first stage" regional rail route would run 18 miles between North Napa and the Vallejo Ferry Terminal on existing railroad tracks. A total of 15 stations would be constructed, as illustrated in

Figure ES-7. As previously mentioned, the proposed line would carry about 7,000-8,000 daily passengers by 2015, assuming service every 30 minutes from early morning to late evening. Coordinated local bus connections would be provided at most stations. At the Vallejo Ferry Terminal, connections with the Vallejo-San Francisco ferry and regional bus routes to BART, Benicia, and Central Contra Costa County would be provided. Other regional bus connections would be provided in American Canyon, at the Napa Transit Center, and at the North Napa terminal. Projected operating expenses are \$8-10 million annually, based on contracting with the short line Napa Valley Railroad that also operates the Napa Valley Wine Train.

Construction costs are estimated at \$80–\$90 million, primarily for track upgrades, station construction, improvements to eliminate interference with existing Wine Train schedules, the 0.75 mile track extension to the Vallejo Ferry Terminal, and a fleet of a half-dozen 2-unit self-propelled low emission diesel multiple units (DMUs) similar to those operating between Oceanside and Escondido in San Diego County. See Figure 12 for a map of the proposed route. The Napa River Flood Control Project has funded many railroad capital improvements, including grade separations at Imola Avenue and over Highway 29, and relocation and expansion over the downtown Napa flood channel.

Recent Low Cost U.S. Regional & Commuter Rail Projects				
Nashville, TN	Music City Star (used cars)	31 miles	\$41 million	\$1.3 million/mile
Albuquerque, NM	RailRunner	48 miles	\$135 million	\$2.8 million/mile
Austin, TX	Capitol Metrorail	32 miles	\$120 million	\$3.8 million/mile
Portland, OR	Wash Co Commuter Rail	14.7 miles	\$117 million	\$8.0 million/mile

Estimated purchase price of the railroad currently owned by Union Pacific and stretching east to Suisun City through Jamieson Canyon is about \$70-\$80 million at 2008 valuations, including the worth of the now much shrunken freight operation after closure of Napa Pipe. Purchase of the railroad would be the first step in projection implementation.

Figure ES-7 also illustrates potential streetcar routes within the Vallejo and American Canyon area. Most of these routes would use existing railroad tracks, which are now in threat of abandonment or no longer used for freight traffic, or would parallel the proposed Vallejo-Napa regional rail line. Local streetcars within Vallejo can also serve as the focus of existing and future sustainable development.

Phase Two extensions could include Regional Rail extensions to St. Helena from North Napa (assuming political acceptance), and from American Canyon to Fairfield-Suisun City via the Jamieson Canyon route. Further extension across the Carquinez Strait connecting to West Contra Costa County should also be considered, but would be an order of magnitude more expensive, e.g., several hundred million versus tens of millions for Phase One and Phase Two projects. Local streetcar operations in downtown Napa should also be considered, but is beyond the scope of paper. The author will also be putting together a proposal for local streetcar services in Vallejo, Napa, St. Helena and Calistoga during the next few months.

Figure ES-7. Next Page



Figure ES-8. Napa Area Detail.

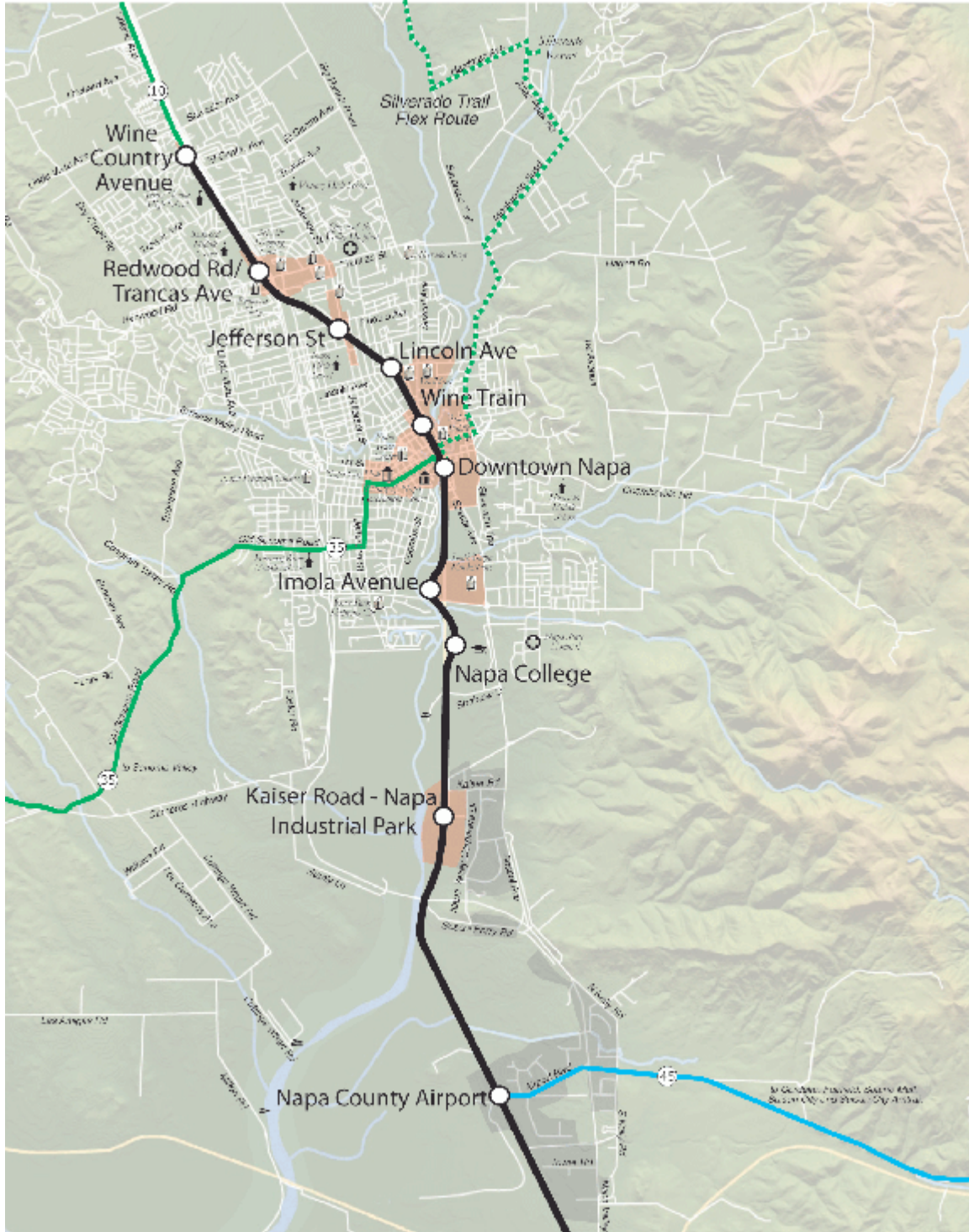


Figure ES-9. Vallejo Area Detail (red lines are proposed local streetcar routes).



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A Modern, Comprehensive Public Transit Network: The Key to Sustainable Mobility for the Napa Valley

May 2008

By Michael D. Setty

1. Introduction

The Brundtland Commission, created by the United Nations in 1983 and led by the former Norwegian Prime Minister Gro Harlem Brundtland, defined “sustainable development” as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹

In the Napa Valley, this means reducing our proportionate share of the negative impacts on climate change, energy depletion and numerous other environmental problems. An increasing number of local businesses are “going green” in areas such as “LEED” green building standards, incorporating “green” sustainable practices into how their business operates, and other efforts to reduce environmental impacts and energy intensity. Non-profits are increasingly active in sustainability efforts, such as the Gasser Foundation’s “Sustainable Napa Valley” initiatives². Napa Valley vintners and growers are also at the forefront of sustainable farming practices and innovations³. Local government and schools have also established sustainability initiatives including the St. Helena Climate Protection Task Force⁴, Napa Valley College⁵, and the County-wide sustainability goals adopted by the former Napa County League of Governments⁶ (a forum recently handed to the Napa County Transportation Planning Agency – NCTPA). Local governments and businesses also sponsor the visitor-oriented “Napa Valley Car Free” website⁷:

Our principal goal for this website is to provide pre-trip traveler information to our visitors to the Napa Valley so they can plan their trip using viable transportation alternatives to driving a car. Like our motto, we want our visitors to the Napa Valley to “take a vacation from their car.” Our message is: Come and visit our beautiful valley, but please leave your car at home.

Managing our traffic congestion problems (and the resulting negative air quality impacts) is very important to those of us who live, work, and play in the Napa Valley. Traffic congestion cannot be solved by merely adding more roadway capacity. We need to get people to change their travel choices, including when and how they travel.

According to the Association of Bay Area Governments (ABAG), in 2002 Napa County contributed about 1.7% of the Bay Area’s annual 85.4 million tons of greenhouse gas (GHG) emissions, about the same proportion as our population share within the Bay Area Air Quality Management District (BAAQMD)^{8,9}. Of the estimated 1.4 million annual tons of GHG produced by Napa County, about 52% came from transportation including about 33% from personal vehicles. In 2002 a daily average of 153,000 gallons of motor vehicle fuel was sold in Napa County, and 2.6 million daily vehicle miles traveled (VMT) occurred within the County. About 11 tons of GHG were emitted annually for each Napa County resident, of which an estimated 3.6 tons (33%) were from personal vehicles, an annual total of about 460,000 tons of CO₂. On average, personal vehicle travel during

2002 averaged 20.3 daily VMT per resident, slightly less than the BAAQMD-wide average of 20.8 daily VMT per resident.

2. Sustainability vs. Traffic Projections

In 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05¹⁰, which sets targets for reduction of California’s greenhouse gas (GHG) emissions as follows:

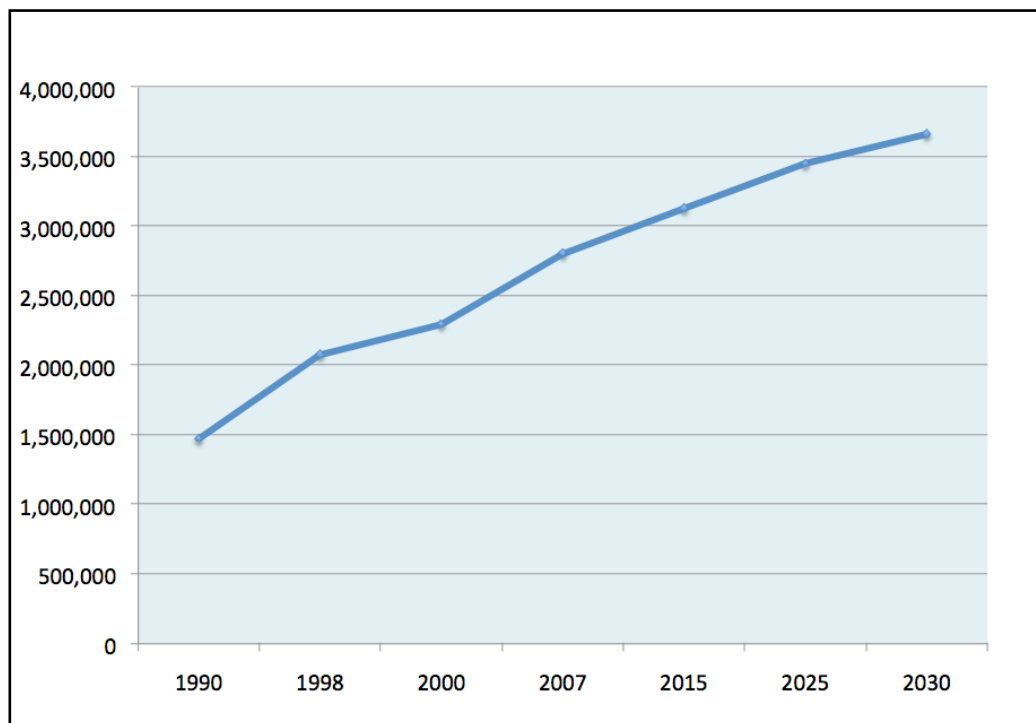
- ✚ Reduce California’s GHG emissions to 2000 levels by 2010;
- ✚ A reduction of GHG emissions to 1990 levels by 2020;
- ✚ And, a reduction of GHG emissions to 80% below 1990 levels by 2050.

In 2002 a daily average of 153,000 gallons of motor vehicle fuel was sold in Napa County, and 2.6 million daily vehicle miles traveled (VMT) occurred within the County. About 11 tons of GHG were emitted annually for each Napa County resident, of which an estimated 3.6 tons (33%) were from personal vehicles, an annual total of about 460,000 tons of CO₂.

By 2030, Napa County’s population is expected to grow to about 155,000, an increase of about 18%-20% from 2000¹¹.

Between December 2000 and July 2006, Napa County’s non-farm employment grew 10% while overall Bay Area employment declined by 10%¹². The same source projects that the number of jobs in Napa County will grow from 66,800 in 2000 to 89,000 in 2030, up 33% compared to about 18%-20% population growth. Based on this, the Metropolitan Transportation Commission (MTC) and ABAG have a very strong basis for projecting an increase in daily VMT within Napa County from 2.3 million VMT during 2000 to an estimated 3.7 million VMT by 2030. This is an increase of 61%, which

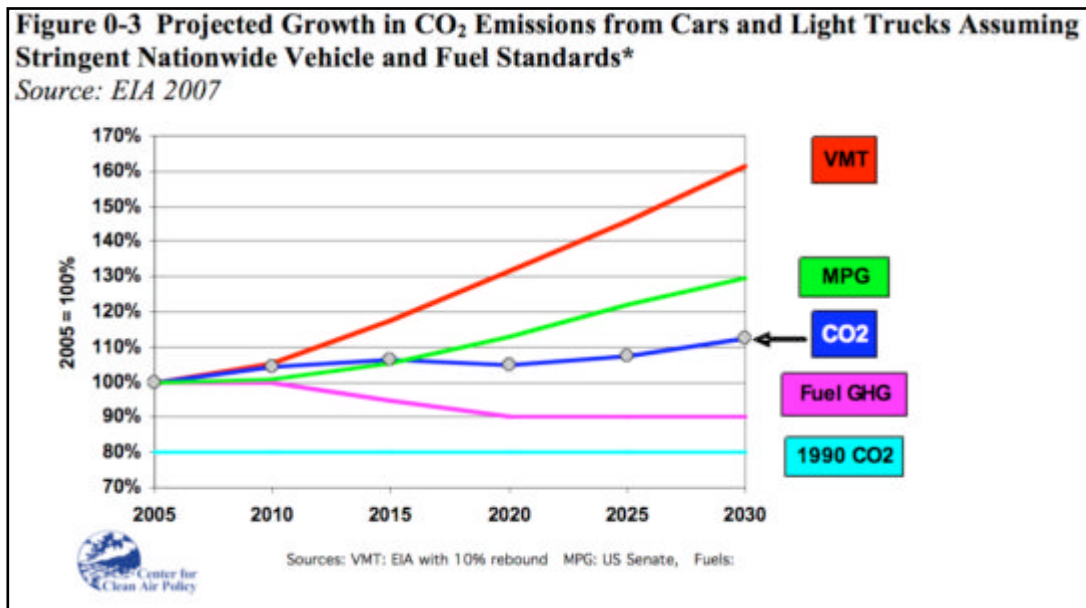
Figure 1. Napa County VMT Growth, 1990 Actual – 2030 Projected



compares to the estimated population increase of 18%- 20% and a 29% increase in per capita travel from 18.5 to 23.8 daily VMT. Apart from climate change concerns, this projected VMT growth has major implications for workforce housing needs, growing congestion, and projected needs for new roadway capacity.

Even with the new Federal “CAFÉ”¹³ mandates increasing required automobile fuel efficiency from 27.5 to 35+ mpg (and an overall fleet average of about 27-28 mpg by 2030) Napa County’s projected growth in VMT will increase personal transportation-related greenhouse gas emissions by about 20%-25% compared to 2000 VMT levels; annual GHG emissions from Napa County’s personal vehicles would total about 480,000 tons, a slight net increase from the 2002 GHG emissions estimate.

Figure 2.



A reduction in personal transportation emissions in Napa County to 1990 levels by 2020, let alone 2030, appears problematic. In 1990 Napa County averaged 1.48 million daily VMT, emitting about 265,000 tons of CO₂ assuming a vehicle fleet average of 20 mpg at that time. Given the projected 2030 daily VMT that is 248% higher than 1990 VMT levels, reducing Napa County’s personal vehicle-related GHG would require either an increase to 50+ mpg, or a 40%-50% reduction in daily VMT based on the new Federal CAFÉ mpg requirements and the overall vehicle fleet mpg average in 2030.

A study by the California Lung Association released in March 2008¹⁴ estimates that currently the existing California motor vehicle fleet emits 150 million tons of GHG annually, but that total vehicle emissions would decline to only 140 million tons annually by 2030 under current programs such as CAFÉ and vehicle turnover. The Lung Association study estimates that up to 110 million tons of GHG could be eliminated if all motor vehicles within the state were converted to zero-emission vehicles and the cleanest gasoline vehicles, e.g., “pluggable hybrids.” This projected GHG emissions reduction could be met only if 100% of the electric power substituted for gasoline came from 100% non-carbon based sources such as hydroelectric, solar, wind or nuclear power or from biofuels that did not generate significant CO₂ emissions.

Expectations have risen about the potential for hybrid and “pluggable hybrid” vehicles to dramatically reduce gasoline consumption and related GHG emissions, an example being the technical progress assumed in the Lung Association study. The Oak Ridge National Laboratory (ORNL) also recently released a study of the impact of such

Given the projected 2030 daily VMT that is 248% higher than 1990 VMT levels, reducing Napa County’s personal vehicle-related GHG would require either an increase to 50+ mpg, or a 40%-50% reduction in daily VMT based on the new Federal CAFÉ mpg requirements and the overall vehicle fleet mpg average in 2030.

vehicles on the nation’s electric power grid, assuming pluggable hybrid market penetration of 25% by 2020¹⁵. With such still relatively low market penetration, projected declines in GHG emissions from personal vehicles would fall far short of adopted targets, even if all substitute power came from GHG-free electricity generation.

However, battery technical improvements are not proceeding nearly as quickly as many have hoped and many startup companies have hyped. The maker of the Prius hybrid, Toyota, has expressed doubts about lithium-ion batteries for hybrids, questioning “...battery cost, availability, performance and packaging.”¹⁶ Such technological setbacks lengthen the time for significant fuel consumption and GHG emission reductions, since replacing the entire U.S. personal vehicle fleet is expected to take at least 15 years.

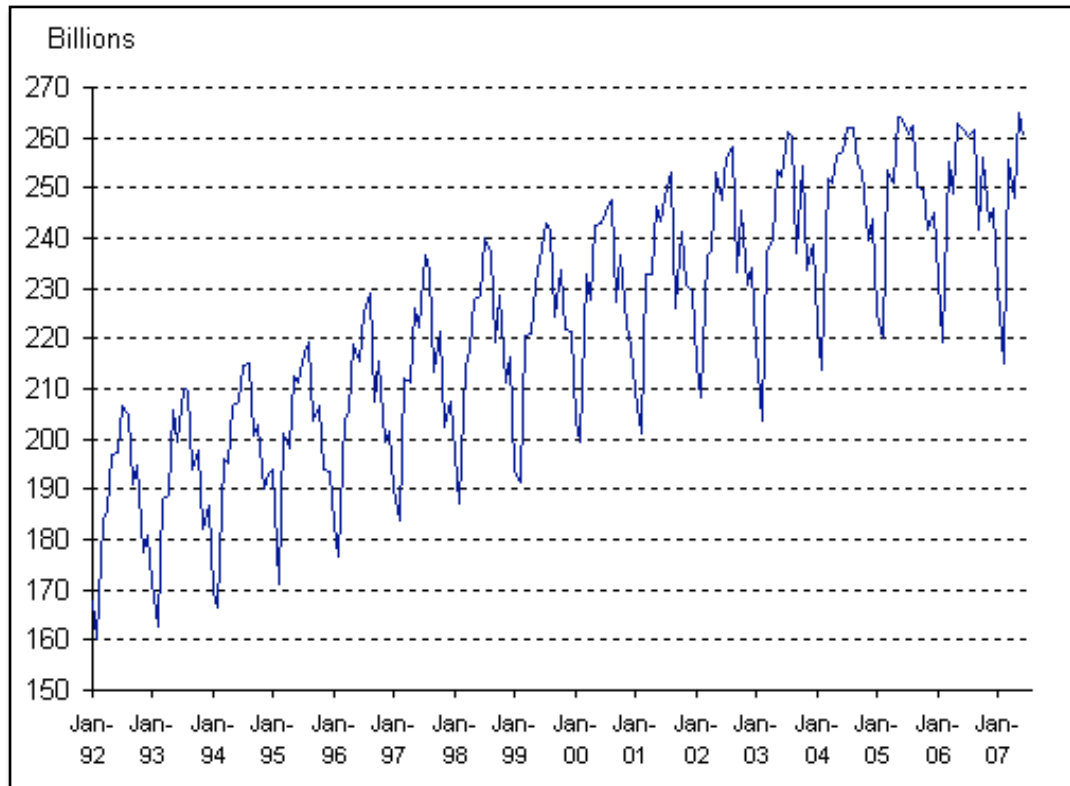
3. High Gasoline Prices and Oil Depletion

Given that “technological fixes” are unlikely to solve the GHG emissions problem, there are some indications that the issue could be partially moot. Recent trends showing small declines in national VMT in 2006 and 2007, and the prospect of worldwide “peak oil” followed by a steady decline in worldwide oil production, suggests that the level of daily travel projected by MTC and Caltrans for 2030 may not occur. According to the Federal Highway Administration (FHWA), total vehicle miles traveled in June 2007 declined - 1.2% compared to June 2005¹⁷.

As shown in Figure 3, total VMT in the U.S. began to slow dramatically in 2003 and 2004, and there has been essentially no VMT growth since 2005 due to dramatically increasing gasoline prices, and despite the addition of more than 2 million U.S. residents each year. In early March 2008, world oil prices soared to nearly \$113 per barrel, reflecting a decline in the U.S. dollar against other currencies, commodity market speculation, and an increasing number of experts say reflects the looming prospect of “peak oil,” e.g., reaching maximum worldwide oil production followed by steady declines in oil production. It is possible that “peak traffic” has met “peak oil.” In a 2003 article in the *Oil & Gas Journal*¹⁸, the Association for the Study of Peak Oil (ASPO) predicted that conventional oil production would peak by 2010:

There is urgency, the agencies believe, to “make the world aware that the party is over,” in the words of Kjell Aleklett, professor of physics in the Department of Radiation Sciences at Uppsala University. Aleklett started the Uppsala Hydrocarbon Depletion Group in January 2002. “The depletion of oil, which furnishes 40% of traded energy and 90% of transport fuel, should by all means be a sensitive subject for all governments as well as for you as an individual. It heralds for mankind a discontinuity of historic proportions,” he warned.

Figure 3. United States VMT Trends, 1992-2007 - "Peak Traffic?"



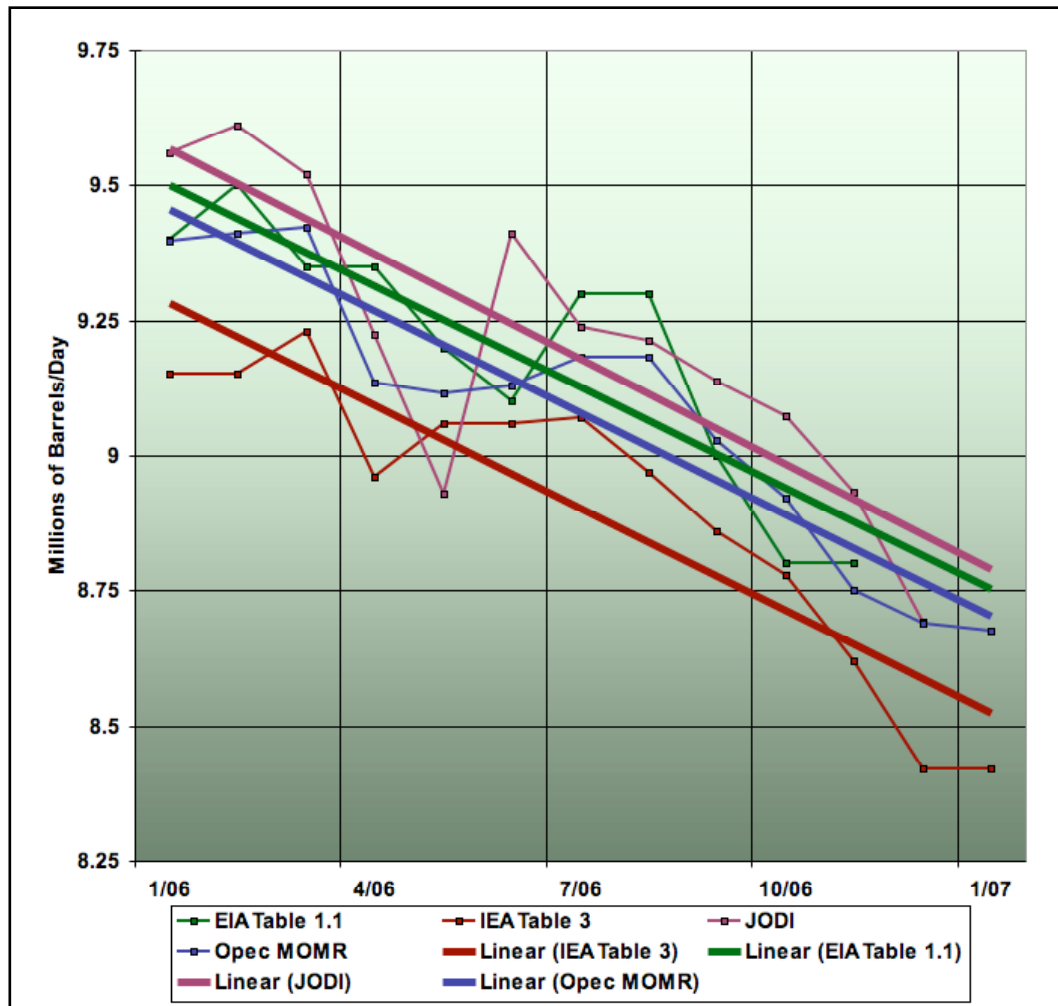
The quote continues:

Kenneth Deffeyes, a colleague of [oil depletion theorist] M. King Hubbert at the Shell Oil Co. research laboratory in Houston [in the 1950's to 1970's], explained the implications of "discontinuity": "After the peak, the world's production of crude oil will fall, never to rise again. The world will not run out of energy, but developing alternative energy sources on a large scale will take at least 10 years. In the meantime, there will be chaos in the oil industry, in governments, and national economies." Hubbert is known for his prediction in 1956—later proven correct—that US oil production would peak in 1970.

In his 2006 book *Twilight in the Desert: The Coming Saudi Oil Shock and the World Economy*, energy industry investment banker Matthew Simmons¹⁹ argues that oil production from Saudi Arabia would "...peak in the near future, if it had not done so already," according to Wikipedia. In a recent article, Simmons states:

My opinion is that it's increasingly likely that we actually set an all-time record in May 2005 of 74,252,000 barrels per day. And for the first three months of 2007, we're almost a million barrels per day behind that, and we're dropping fast. If that record still holds a year from now, I'll bet someone ten-to-one that we set peak oil in May 2005 and it's now past tense.²⁰

Figure 4. Saudi Arabia Oil Production Trends, 2000-2007



According to a March 2007 article in *The Oil Drum*²¹, a website discussing the petroleum industry and peak oil issues, Saudi oil production declined by 8% during 2006. Figure 3 illustrates one of this article’s graphics of Saudi production trends since 2000 based on four different sources. The author of *The Oil Drum* article points out:

The resulting graph is extremely striking, I think. The four different sources all estimate Saudi production slightly differently - they fluctuate in different ways month to month, and disagree over the absolute level (that last may be differences in exactly what is defined as oil). However, the regressions make clear that all four sources are in strong agreement about the nature of the decline. The slopes of the lines are very similar.

The implied decline rate through the year is 8% ± 0.1%. (Note that the year on year decline from 2005 to 2006 will only be about half that, as the decline only began at the beginning of 2006). As far as I know, there are no known accidents or problems that would explain any restrictions on oil supply, and the Saudis themselves have maintained publicly that their production is unproblematic and they intend to increase it.

In other words, perhaps concerns about increasing GHG emissions from transportation sources may be partly “moot” because we may have greatly reduced liquid fuel to fuel those emissions. Matt Simmons, the Texas oil industry investment banker with more than 30 years in business, questions the veracity of the Saudis:

Well, if I had to bet, I would bet somebody about four-to-one that they're producing every barrel that they can produce. The idea that no one wants their oil is really stupid. And they're also going to spend close to \$70 billion on some unbelievably hairy projects.²²

4. Market-Oriented Strategies to Reduce Congestion?

While many increasingly worry about GHG emissions and the negative impacts on climate change, or are increasingly concerned about the specter of “peak oil,” others including the transportation leadership within the Bush Administration, worry about traffic congestion and the introduction of the private sector into the provision of highways and roads. In a minority report dissenting the recommendations of the National Surface Transportation Policy and Revenue Commission to substantially increase transportation funding and spending, Bush Administration Transportation Secretary Mary Peters stated:

We believe, however, that a failure to properly align supply and demand, not a failure to generate sufficient tax revenues, is the essential policy failure. When consumer demand determines supply, it will engender funding sufficient to meet the demand. The problem is not how to raise a certain level of revenue, but rather how to develop a policy framework that will unleash efficient capital investments, empower consumers, reduce congestion, stimulate technology improvements, improve America's quality of life, and support the increased productivity of American businesses.

The broad policy failures we experience in these areas today are further exacerbated by a Federal-centric funding and regulatory structure that stifles creativity and innovation at the State and local levels. Yet a majority of our colleagues on the Commission urge as a central recommendation, an expansion of that very system. The Commission Report thus serves only to reinforce the misconception that substantially more Federal spending will improve America's surface transportation system.²³

The views of Transportation Secretary Mary Peters are reinforced by Robert Poole, director of transportation at the Reason Foundation, a libertarian think tank:

...As applied to highways, the 20th-century paradigm for limited-access highways was what Peter Samuel has called the tax-and-grant model. Levy fuel taxes on highway users, amass the money in a central fund, and use some kind of politicized central planning to parcel it out among numerous contending projects. It's basically the same model at the state level and at the federal level.

*The toll concession model is profoundly different. It says limited-access highways are businesses, which can and should be developed and run by investor-owned companies. Those companies charge users directly, in proportion to their use. **And they make decisions on the size, nature,***

and location of highways based on return on investment. [emphasis added]. *But because highways, like electricity and natural gas, have elements of monopoly and are also vested with various public interests, they are generally subjected to some form of public oversight (in this case, via enforcement of public-interest provisions included in the concession agreements). Thus, under the toll concession model, highways are an investor-owned network utility, like other network utilities.*

Transportation Secretary Mary Peters largely accepts the toll concession paradigm as what we should be shifting to for 21st-century highways. That-and not slavish adherence to an ideological "no new taxes" mantra-accounts for the thoughtful dissent she and two other national commission members authored. And it's also the underlying reason she's been getting beaten up in the media and in Congress in recent weeks.²⁴

Peters and Poole are also theoretically correct that, under normal market conditions, "When consumer demand determines supply, it will engender funding sufficient to meet the demand." Few people will also disagree with Secretary Peters that the U.S. transportation system should "...develop a policy framework that will unleash efficient capital investments, empower consumers, reduce congestion, stimulate technology improvements, improve America's quality of life, and support the increased productivity of American businesses." Poole compares limited access highways to "natural monopolies" such as electricity and natural gas, so require some form of public oversight through enforcement of public-interest provisions in the concession agreements.

Roads have many impacts, good and bad, well beyond their commercial potential:

- ✚ Providing an armature for transportation and commerce
- ✚ Impacting land use and community character
- ✚ Driving sprawl and private development patterns
- ✚ Generating massive GHG emissions and energy use
- ✚ Primary source of many other environmental problems

Since the adoption of the automobile by Americans a century ago, provision by government of roadways has been seen as a "public good" regardless of political viewpoint. According to Wikipedia:

*Paul Samuelson is usually credited as the first economist to develop the theory of public goods. In his classic 1954 paper *The Pure Theory of Public Expenditure*²⁶ he defined a public good, or as he called it in the paper a "collective consumption good", as follows:*

...[goods] which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtractions from any other individual's consumption of that good..

This is the property that has become known as Non-rivalness. In addition a pure public good exhibits a second property called Non-excludability: that is, it is impossible to exclude any individuals from consuming the good.²⁵

Unlike many public goods, the available capacity of roadways at any given moment is severely limited particularly during peak periods, and—as Secretary Peters and Robert Poole would point out—in the absence of road tolling and/or “congestion charges,” then scarce roadway capacity is rationed on a first-come, first-served basis through congestion and delays. It is obvious if a \$5.00 toll were imposed each way on Highway 12 through Jamieson Canyon during peak periods, for example, traffic would flow much more smoothly and delays would mostly disappear. There is no doubt that such “clean” policy solutions to congestion would work, but are not generally acceptable to motorists and voters. Motorists would say that they’ve “already paid for the roads” through gasoline and other taxes, and instituting tolls on existing roads is a double charge.

New toll roads in Orange County, Texas, Florida and elsewhere have generally experienced little public resistance. However, new roadways of any kind are often opposed due to potential environmental damage or suburban sprawl. Recently, Governor Schwarzenegger replaced his brother in law, Bobby Shriver and actor Clint Eastwood as State Park Commissioners in the wake of their vote against the proposed 16-mile Foothill South toll road extension through a nature reserve and San Onofre State Beach in Orange County.²⁶ Though specifically denied by Schwarzenegger, many people believe Shriver and Eastwood were terminated (sic) due to the governor’s desire to placate Orange County interests that strongly support the road.

While “reducing congestion” and facilitating development are apparently the main concerns of the political/development establishment in Orange County, **on this kind of issue most Californians—including Napa Valley residents—probably would side with Clint Eastwood against Schwarzenegger and Orange County.** In other words, most people seem likely to see beyond the narrow privatization, facilitating development, and “reducing congestion” agenda of Mary Peters, Robert Poole, Peter Samuel and those of similar views.

While implementing tolls for the sole purpose of reducing congestion and placing public roadways in the hands of strictly private interests are much too narrow public policy goals except to those with strong libertarian views, increasing user fees on driving makes much economic and environmental sense. As transportation analyst Todd Litman points out in his October 2006 report *Smart Transportation Investments: Reevaluating the Role of Highway Expansion for Improving Urban Transportation*:

Unlike many public goods, the available capacity of roadways at any given moment is severely limited particularly during peak periods, and—as Secretary Peters and Robert Poole would point out—in the absence of road tolling and/or “congestion charges,” then scarce roadway capacity is rationed on a first-come, first-served basis through congestion and delays.

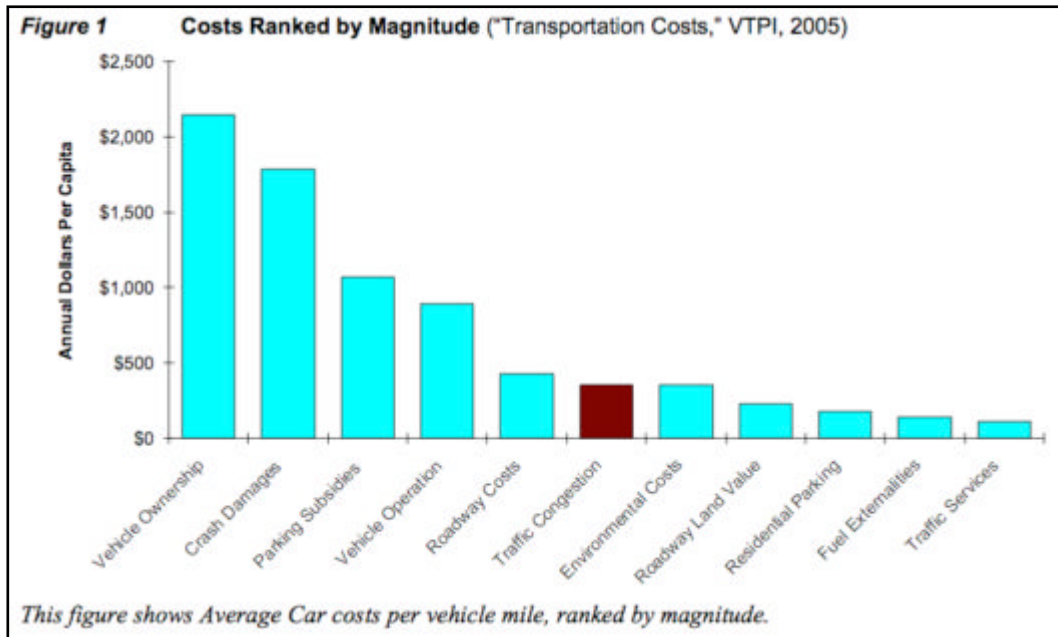
Such projects are only cost effective if they can be funded by peak-period users. Even based on proponents’ optimistic projections, highway expansion projects would cost \$200 to \$400 annually per urban commuter. When faced with such tolls motorists often prefer to shift route, mode or destination, so such projects cannot recover their costs. As a result, they would require funding from people who do not directly benefits, which is inefficient and inequitable. Described differently, traffic congestion results from market distortions that underprice driving and stimulate sprawl, resulting in economically excessive motor vehicle travel (“Market Principles,” VTPI, 2006). Under such circumstances, expanding

highways cannot reduce long term congestion, and would increase other transport problems such as downstream congestion, parking demand, accidents, pollution emissions, sprawl, and inadequate mobility for non-drivers.

Alternative strategies can reduce traffic congestion and provide other benefits. Advanced modeling indicates that the most cost effective solution to traffic congestion reduction includes a combination of transit improvements, road pricing and smart growth land use policies. This is most efficient and equitable overall because it reflects market principles, including viable consumer options, cost-based pricing and more neutral public policies.

This is not to suggest that driving is bad or that highways should never be improved. However, when all impacts and options are considered, highway expansion is significantly more costly than advocates claim and provides less overall benefit than many alternative policies and programs.²⁷

Figure 5. Litman's Estimates of Motor Vehicle Expenses and Externalities



Litman's analysis raises several issues regarding future pricing of motor vehicle usage:

- ✚ Should per mile charges for road maintenance and construction be considered? What rates would generate how much revenue per year? This will be an increasingly critical issue as traditional gasoline tax revenues decline with CAFÉ and shifts to non-carbon based fuel, e.g., pluggable electric hybrids.
- ✚ Should bridge tolls across the Carquinez Straits be increased to improve intercity and regional rail service along the I-80 corridor and on "feeders" such as the Napa Valley Corridor? An additional \$1.00 toll would generate about \$35-\$36 million annually.

- ✦ What about “charging admission” to the Napa Valley at all entry roads? A \$10 charge would generate over \$100 million annually; rebating 50% would be over \$400 annually per local resident, offsetting tolls paid except for local commuters not using alternatives to single-occupant automobiles.
- ✦ Should converting insurance charges from a fixed to variable cost be considered, e.g., charge by the mile? According to Litman, existing vehicle insurance at current prices and VMT is about \$0.08/mile. Another \$0.04-\$0.05 per mile would be needed to cover medical costs of accidents currently paid for by health insurance, not auto insurance according to Litman. Overall traffic would decline about 10%-15%.
- ✦ Returning paid parking to dense areas such as downtown Napa—where new garage spaces cost \$30,000+ each—should be considered. Also look at eliminating minimum parking mandates, particularly in commercial areas.²⁸
- ✦ “Carbon Tax Shift” - Should taxes on GHG emissions be added to gasoline and other motor fuels, with the resulting revenues shifted to reduce other taxes?²⁹ (Carbon taxes have been endorsed by Al Gore).

5. Sustainable Mobility for the Napa Valley

During 2007 and early 2008, the Napa County Transportation Planning Agency (NCTPA) has been developing a new Strategic Transportation Plan for Napa County covering through 2035. Most known stakeholder groups in the Napa Valley have been queried regarding their concerns regarding transportation and the intersection with broad, well-known objectives such as preserving agriculture that have decades of proven public support. NCTPA literature emphasizes the following critical issues directly impacted by the transportation system³⁰: (1) Maintain the agricultural character of the County; (2) Address Napa’s jobs/housing balance’ (3) Examine reducing congestion and promotion of better air quality by providing alternatives to single-occupant auto trips; (4) Minimize impacts on valuable habitat and productive farmland; and (5) Explore creative solutions for critical goods movement.

For every passenger mile on transit, recent research shows that 2.1-2.2 personal vehicle VMT is replaced³³

Based on the input received from a 14-member Citizens Advisory Committee and numerous stakeholder interviews, a series of tentative transportation strategies meeting the above-listed concerns have been developed as shown in Figure 6a and 6b.

These strategies have been expanded with more detail, reorganized and refined as of April 30, 2008. The essential thrust of these proposed strategies remain the same, however. Bus Rapid Transit (BRT) is also now suggested as a possible strategy. All but potential “Supply Side” Strategies C and K in Table 6b below can be considered to support or strongly support sustainability in general and “sustainable mobility” in particular.

Personal motor vehicles are not going to disappear any time soon. However, as discussed in the previous section, transportation pricing strategies can support a wide range of sustainability policies in addition to the relatively narrow objectives of reducing congestion and privatizing provision of new roadway capacity. But obtaining

Figure 6a. Proposed NCTPA Transportation “Supply Strategies” as February 2008³¹

Description		Would the rail proposal discussed in the following section support strategy?
SUPPLY STRATEGIES		
Key Strategy A	Increase Transit Service and Ridership	Strongly Support – Rail is proven to attract 34% to 43% more passengers given same capacity offered as buses³²
Key Strategy B	Maintain Critical Street and Road Infrastructure	Support - Some pressure would be taken off road system as trips diverted
Key Strategy C	Invest in Strategic Road System Expansion in South County	Support - Could reduce some capital costs for capacity expansion based on diversion from personal vehicles
Strategy D	Encourage Development of Roundabouts	Perhaps – roundabouts in Oakville, Rutherford and other locations would increase safety of pedestrian travel to/from possible rail stops
Strategy E	Promote Freight Rail in South County	Strongly Support
Strategy F	Promote Energy Efficient and Environmentally Benign Systems	Strongly Support – For every passenger mile on transit, recent research shows that 2.1-2.2 personal vehicle VMT is replaced³³
Strategy G	Improve Road Safety	Support – Diversion of trips
Strategy H	Maintain Options for Future Rail	Strongly Support – Sooner than Later!
Strategy I	Provide Information Systems	Strongly Support – provide easy to understand transit trunk-line
Strategy J	Maintain Options for Water Transportation	Support – proposal station location in downtown Napa next to Napa River

sustainable mobility also goes well beyond pricing and economic tools. And while this paper argues that modern, comprehensive public transit built around rail is the key to sustainable mobility for the Napa Valley, “sustainable mobility” means also all existing and future alternatives to “drive alone,” e.g., walking, bicycles, ride-sharing, car-sharing, guaranteed ride home, paratransit, jitney services, taxi, public transportation and telecommuting.

Stakeholder and general public input obtained by NCTPA has generally been consistent in one area: the need for “walkability.” Whether walkability means “safe routes to school,” alternatives for seniors, well-located services, visiting the Napa Valley car-free, or changing the local culture regarding walking and bicycling, the central principle applied to bipedal species such as human beings is clear:

“Walkability” is the glue holding together all human activity, even if one is walking through our vast expanses of “drivable sub-urbanism.”³⁶

Figure 6b. Draft NCTPA Transportation “Demand Strategies” as February 2008³²

Description		Would the rail proposal discussed in the following section support strategy?
DEMAND STRATEGIES		
Key Strategy L	Workforce Housing Production Near Jobs	Strongly Support – Rail between Napa and Vallejo would provide “armature” that workforce housing can be built around while minimizing new traffic generation, e.g., up to 50% reduction
Key Strategy M	Promote City/Town Centers to Be Easily Navigated by Foot and Bicycle	Strongly Support – Rail between Napa and Valley would provide “armature” that existing “walkable urban” areas (e.g., downtowns) can be reinforced and new neighborhoods developed as needed ³³
Key Strategy N	Encourage Car-Free Tourism	VERY STRONGLY SUPPORT! – Rail option from Vallejo Ferry Terminal would attract far more visitor trips than any possible bus system, perhaps 4-5 times
Key Strategy O	Address Transportation Needs of a Growing Senior Population	Strongly Support – Rail stations would be focus of senior-oriented service and easy to use for costly longer trips, particularly if “low floor” level boarding provided
Key Strategy P	Encourage Alternatives for Commuting and Mid-Day Work Trips	Strongly Support – Rail generally attracts 34% to 43% higher patronage for a given level of capacity provided ³⁴
Key Strategy Q	Promote Safe Non-Auto Routes to School, and After School Programs	Support – Applies particularly to schools and colleges near proposed rail stations
Strategy R	Change the Culture of Bicycling and Walking in Napa	Support – Trains provide more room to carry bicycles than buses, and would connect various “islands” of “walkable urbanism” around stations
Strategy S	Promote Well-Located Health and Social Service Delivery to Minimize Travel	Support – To the extent services not already in a given community are within easy walking distance in another
Strategy T	Discourage Single-Occupant Vehicles by Parking Disincentives	Strongly Support – Required parking can be minimized near stations, and an attractive transit service would provide alternatives to paid parking in the densest areas near stations ³⁵

Equally important, public transportation should mean “integrated community mobility” – that is, all transit modes connect at stops and facilities located near major trip destinations of both residents and visitors, near community services, that there’s a common information access point on the Internet or dialing 511, and a common “smart card” to pay for fares on any transit service, in addition to cash. Transportation is expensive in terms of both dollars and time, whether provided by personal vehicles, public transit, walking or bicycling.

Most of the proposed strategies in the NCTPA draft *Strategic Transportation Plan* are consistent with the concept of “sustainable mobility” for the Napa Valley. The benefits of sustainable mobility include:

- ✦ Freedom of mobility for those who cannot drive
- ✦ Freedom of mobility for those who can, but choose not to drive
- ✦ Provide a template for reinforcing sustainable “walkable urbanism” as previously mentioned, in existing communities and developing new walkable neighborhoods as needed. This means mixed use development around transit stations including workforce housing mixed with suitable retail and commercial uses, and public services within areas friendly to walking and bicycling, not just personal vehicles.³⁰
- ✦ Divert demand for residential and commercial development away from the Agricultural Preserve, and reinforce the agricultural and other rural character of the Napa Valley and Napa County as a whole
- ✦ Increased prosperity and access to jobs and services for everyone, not just those who can afford a personal vehicle
- ✦ Easy, sustainable access to employees for employers
- ✦ Freedom from foreign oil and other polluting energy sources
- ✦ Gradual, sustained reductions in greenhouse gas (GHG) emissions
- ✦ Freedom from congestion and traffic

6. Sustainability, Drivability, Walkability and Rail

Contrary to much of the work produced by academics, some recent research from U.C. Davis bears a strong resemblance to reality. In general order, when people travel they tend to “like” walking, jogging and bicycling first, personal vehicles a close second, rail third, and buses a distant fourth. See Figure 7 for a survey of “travel liking” variables.

Figure 7. Short-Distance Travel Liking Variables, S.F. Bay Area (abridged)

Mode	Strongly Dislike	Dislike	Neutral	Like	Strongly like	TOTAL Neutral+
Walk/jog/Bicycle	4.0%	4.9%	24.4%	48.8%	17.9%	91.1%
Personal Vehicle	2.5%	9.2%	30.2%	47.6%	10.5%	88.3%
Rail	11.9%	17.0%	39.8%	28.3%	3.1%	71.2%
Bus	28.6%	34.8%	28.3%	7.6%	0.7%	36.6%

Source: Mokhtarian & Ory 2005. *When is getting there half the fun? Modeling the liking for travel.* <http://repositories.cdlib.org/postprints/549>

That people like driving nearly as much as walking is not news. But unlike walking, jogging or bicycling, most people are also aware that the act of driving is currently unsustainable, given its negatives such as congestion, air pollution, global greenhouse gas emissions, accidents, noise, parking shortages, and so forth. As discussed earlier in

this paper, developing “sustainable mobility” is strongly focused on mitigating the negative impacts of “sub-urban drivability” and development of alternatives acceptable to most people such as transit, walking and bicycling.

While buses are a favorite sustainable mobility strategy among some transportation bureaucrats and some “social justice” advocates³⁷, they are severely limited in their likely success when nearly two-thirds of the public “dislike” or “strongly dislike” buses. Those who cannot afford to drive or cannot drive for other reasons are the vast majority of VINE riders, for example. Local transit patronage in Napa County is only about 6 annual boardings per capita, well below other suburban areas such as East Contra Costa County³⁸. The spectrum of transit services offered by Vallejo is also a case in point: local Vallejo Transit routes are used almost exclusively by the “transit dependent,” the express bus route to BART has a slight majority of “choice” riders, while virtually all Vallejo Baylink ferry users have automobiles available but choose to ride the ferry to San Francisco despite relatively high fares, and the fact that Baylink’s supplemental express buses are usually 10 minutes faster in each direction³⁹.

Most of the proposed NCTPA transportation strategies correctly focus on various means of improving walkability as well as bicycling, strongly supporting sustainable mobility. Most strategies also would help mitigate the negative impacts of driving with first priority given to walkability while still accommodating personal vehicles. NCTPA also gives “key” priority to increasing transit service and patronage, focusing on expansion of bus service. Currently, annual operating costs for VINE services including fixed route, paratransit, and taxi subsidy programs is about \$6 million for about 850,000 annual passengers or \$7.00 per boarding; nearly \$5 million is spent annually for 820,000 annual fixed route passengers, or about \$6.00 per boarding ride.⁴⁰ The NCTPA strategy listing discusses increasing bus frequencies to every 30 minutes on most routes, which at current transit productivity levels would cost about \$6.00 to \$7.00 per additional passenger boarding, even for short-distance bus trips within Napa.

Rail is strongly preferable to buses for many reasons:

- ✚ Figure 7 shows that 71% are “neutral” or more positive to rail, compared to 63.4% who “dislike” or “strongly dislike” the bus.
- ✚ Research on occupancies on trains and buses shows that given the same overall capacity offered, overall vehicle occupancies are 34% to 43% higher⁴¹. This is confirmed by historical analysis⁴² that independently found similar percentages.
- ✚ According to the public interest think-tank Reconnecting America, the six million U.S. households located within 0.5 mile of existing rail stations on average own 0.9 fewer automobiles saving 50-60 billion annual VMT, compared to than households more than 0.5 miles away.⁴³ These figures correspond closely with estimates of reduced travel by personal vehicle attributable to the presence of rail transit by Bailey, Mokhtarian and Little⁴⁴.
- ✚ Rail has a much wider influence area than buses, due to demonstrated willingness to walk much farther than to bus stops, and up to 10.9 daily VMT reduced per household located within 0.75 miles of rail stations, versus only 3.3 daily VMT reduced per household located within 0.25 miles of bus stops⁴⁵.

Increasing Napa County’s per capita transit usage rates to the same level as East Contra Costa County would require quadrupling current expenditures on fixed route bus service to over \$20 million annually, and at least \$25 million annually including supplemental paratransit. The required fleet of 100+ full-sized buses, smaller buses and vans would require additional capital investment of around \$30-\$40 million for vehicles–100% renewed every 10-12 years–and \$20-\$25 million for expanded operation/maintenance facilities, since the current VINE facility on Soscol Avenue near WalMart is much too small for such a large fleet.

A rail strategy focusing on upgrading existing trackage is a much stronger and more cost-effective strategy than buses in the long term, particularly when it is considered **that rail stations could quickly become the armature around which existing Napa Valley “walkable urbanism” is reinforced and new walkable communities can be developed.** Rail is conducive to coordinated development exactly because of its **fixed** nature. Applying Figure 8 to Napa and American Canyon (excluding Up Valley and other rural Napa County residents) based on the 2000 U.S. Census:

For rail: If the weighted average distance to rail stations is 0.75 mile for the 83,000 persons (31,000 households) in 2000, then the “transformed availability metric” would be 0.6 for rail in this particular case. Therefore, if the metric at 1.0 equals a 10.9 daily VMT reduction per household, then the following equation applies:

$10.9 \text{ reduced daily VMT} \times 0.6 \times 31,000 \text{ households} =$ $202,740 \text{ reduced daily VMT}$
--

The highly flawed (but still useful for reference) *Napa/Solano Passenger/Freight Study (2003)*⁴⁶ estimated “elasticity” for rail service frequency of +0.62 or -0.62, meaning for every 1.0% increase or decrease in service frequency, patronage would increase or decrease by 0.62%. Since on average most rail transit systems operate every 15 minutes, but the Napa Valley rail strategy proposed in this paper would initially operate every 30 minutes, this estimate is reduced to 139,891 daily VMT (50% reduction in frequency = 31% patronage reduction using +0.62/-0.62).

For buses, it is estimated that about 90% of households would be within 0.25 mile of a bus stop, resulting in an assumption that the average distance to a bus stop is 0.15 mile (800 feet). Applying Figure 8 to buses:

$3.3 \text{ reduced daily VMT} \times 0.6 \times 31,000 \text{ households} =$ $81,840 \text{ reduced daily VMT}$
--

Figure 8 can also be used to indirectly estimate likely transit patronage, rail or bus. As previously mentioned, the study by Bailey, Mokhtarian and Little estimated that on an overall basis due to transit’s impact on land use and other factors, each daily passenger mile traveled on transit reduced daily VMT by 2.1-2.2 times⁴⁷. This is the basis for the calculations in Figure 9 below.

Figure 8. Rail and Bus Availability Adjustment Curves

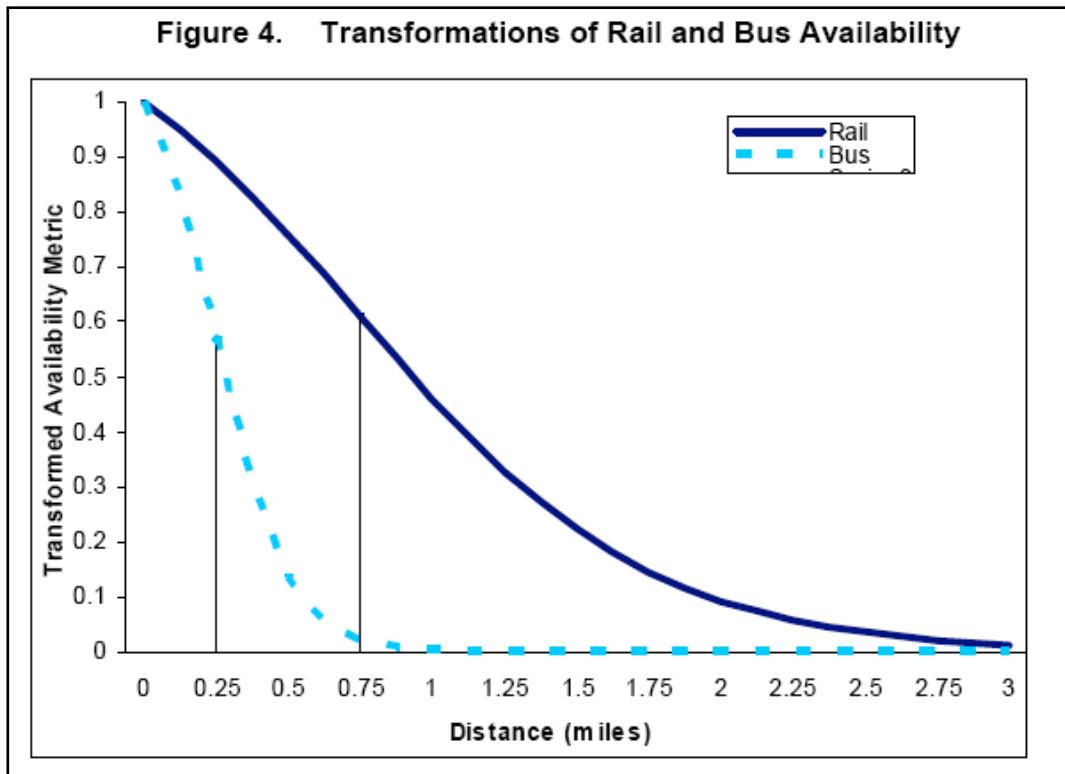


Figure 9. Patronage Estimates based on Bailey, Mokhtarian and Little, 2008

Mode	Daily VMT Reduced	VMT Factor	Daily Transit Passenger Miles	Estimated Average Trip Length [@]	Estimated Daily Transit Boardings	Annual Boardings/ Capita
Rail	139,891	2.2	63,586	8.0 miles	7,950#	17.5
+ Existing Bus ⁴⁸	21,000	2.2	9,633	3.6 miles	2,700	5.9
Total	160,891	2.2	73,219	6.9 miles	10,650	23.4
Bus Only	81,840	2.2	37,200	5.4 miles%	6,900	15.2
Ratio of Total Rail/Bus to Bus Only Patronage					1.54	
@ Proposed rail route is 18 miles from Vallejo Ferry Terminal to Wine Country Ave. Average trip lengths tend to be slightly less than 50% of line length. # plus 1,000 local Vallejo riders % allowing for more "corridor" trips						

Based on the calculations above, after residents had adapted to the new transit service, a combined bus/rail system could reduce daily VMT estimated in 2002 in Napa County by 6.2% (referring back to Figure 1). In contrast, an expanded local bus system with roughly tripled service would reduce daily VMT by only 3.1%. Bus service could be expanded to match the performance of the combined rail/bus option, but this would require increasing existing VINE fixed route bus service by five- or six-fold.

The rail patronage estimate is consistent with the 2003 Napa/Solano passenger/freight study previously cited, MTC's regional rail study⁵⁰ estimating 3,000+ daily passengers crossing the Napa/Solano County line (about 4,900 with 30-minute service using +0.62 elasticity for frequency, and allowing for trips within Napa County or within Vallejo).

See also Setty and Demery, 2005: *Preliminary Patronage Forecast for a Napa/Solano Rail Transit Network, 2005*⁵¹.

Recent research suggests that new housing in transit-oriented development (TOD) can produce up to 50% less personal vehicle traffic than locations away from transit⁵². Based on author estimates, most new housing built in Napa County by 2030 could be constructed around transit stations—assuming that a high quality transit service is actually in operation. Association of Bay Area Governments (ABAG) estimates about 1% annual growth in Napa County, about the historical rate and a level that would produce 10,000-12,000 new housing units by 2030. **The ABAG growth rate projection have been revised downward from previous years and now is generally consistent with local plans.** There is a sufficiently large supply of vacant land near suitable station sites to accommodate 70%-80% of this growth, including:

- ✦ Redwood/Trancas area, perhaps 500+/- units
- ✦ Along Jefferson Street 0.5 mile north and south of the railroad tracks, including locations such as the Caltrans yard, low density commercial development. Perhaps 500+/- housing units.
- ✦ Relocation of the City of Napa Corporation Yard to Kaiser Road area would open up potential for 300+/- housing units
- ✦ Downtown Napa could yield 500-1,000 “upper story” housing units.
- ✦ About 800-900 units are planned in the Soscol Avenue redevelopment area focusing on the Gasser and Fairgrounds properties.
- ✦ The 150-acre Napa Pipe property could yield 1,500-3,200 units depending on the final allowed development density.
- ✦ American Canyon’s potential is around 500-1,000 units, focusing on that community’s proposed downtown.

This potential of an additional 4,600 to 7,400 new housing units could reduce projected traffic growth between 61,000 and 88,000 daily vehicle miles traveled (VMT). When added to existing housing within 0.5 mile of potential rail stations, a Vallejo Ferry Terminal to North Napa rail line would significantly exceed the minimum number of existing and planned housing units required by MTC before considering proposals for new transit trunklines⁵³.

7. Sustainable Transit for Sustainable Mobility

Phase One Regional Rail

The proposed “first stage” regional rail route would run 18 miles between North Napa and the Vallejo Ferry Terminal on existing railroad tracks. A total of 15 stations would be constructed, as illustrated in Figures 10, 11, and 12. As previously mentioned, the proposed line would carry about 7,000-8,000 daily passengers by 2015, assuming service every 30 minutes from early morning to late evening. Coordinated local bus connections would be provided at most stations. At the Vallejo Ferry Terminal, connections with the Vallejo-San Francisco ferry and regional bus routes to BART,

Benicia, and Central Contra Costa County would be provided. Other regional bus connections would be provided in American Canyon, at the Napa Transit Center, and at the North Napa terminal. Projected operating expenses are \$8-10 million annually, based on contracting with the short line Napa Valley Railroad that also operates the Napa Valley Wine Train; this is consistent with the \$11 million annual operating expenses projected for Sprinter service operated by the North [San Diego] County Transit District⁵⁴.

Construction costs are estimated at \$80–\$90 million, primarily for track upgrades, station construction, improvements to eliminate interference with existing Wine Train schedules, the 0.75 mile track extension to the Vallejo Ferry Terminal, and a fleet of a half-dozen 2-unit self-propelled low emission diesel multiple units (DMUs) similar to those operating between Oceanside and Escondido in San Diego County. See Figure 12 for a map of the proposed route. The Napa River Flood Control Project has funded many railroad capital improvements, including grade separations at Imola Avenue and over Highway 29, and the relocation and expansion of the railroad over the downtown Napa flood channel.

Recent Low Cost U.S. Regional & Commuter Rail Projects ⁵⁵				
Nashville, TN	Music City Star (used cars)	31 miles	\$41 million	\$1.3 million/mile
Albuquerque, NM	RailRunner	48 miles	\$135 million	\$2.8 million/mile
Austin, TX	Capitol Metrorail	32 miles	\$120 million	\$3.8 million/mile
Portland, OR	Wash Co Commuter Rail	14.7 miles	\$117 million	\$8.0 million/mile

Estimated purchase price of the railroad currently owned by Union Pacific and stretching east to Suisun City through Jamieson Canyon is about \$70-\$80 million at 2008 valuations, including the worth of the now much shrunken freight operation after closure of Napa Pipe. Purchase of the railroad would be the first step in projection implementation.

Figure 11 also illustrates potential streetcar routes within the Vallejo and American Canyon area. Most of these routes would use existing railroad tracks, which are now in threat of abandonment or no longer used for freight traffic, or would parallel the proposed Vallejo-Napa regional rail line. Local streetcars within Vallejo can also serve as the focus of existing and future sustainable development.

Phase Two extensions could include Regional Rail extensions to St. Helena from North Napa (assuming political acceptance), and from American Canyon to Fairfield-Suisun City via the Jamieson Canyon route. Further extension across the Carquinez Strait connecting to West Contra Costa County should also be considered, but would be an order of magnitude more expensive, e.g., several hundred million versus tens of millions for Phase One and Phase Two projects.

Local streetcar operations in downtown Napa should also be considered, but is beyond the scope of paper. The author will also be putting together a proposal for local streetcar services in Vallejo, Napa, St. Helena and Calistoga during the next few months.

Figure 9. Proposed Vallejo Ferry Terminal-North Napa Regional Rail Route (next page).



Figure 10. Napa Area Detail.

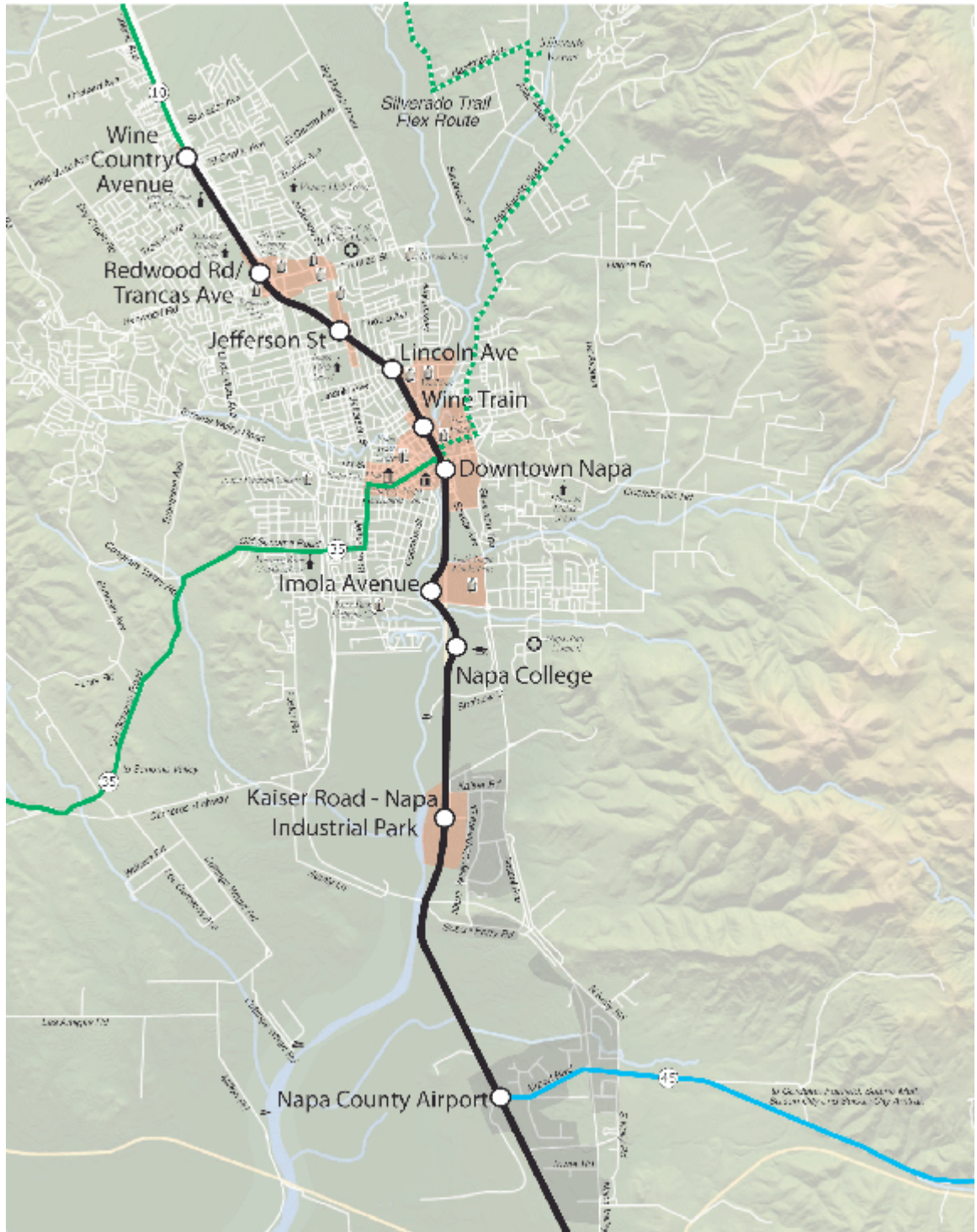


Figure 11. Vallejo Area Detail (red lines are proposed local streetcar routes).



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Supporting Materials

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The Coming Parking Nightmare in Downtown Napa

Michael D. Setty

Wednesday, March 19, 2008

This last Saturday I saw things to come while trying to find a parking space near my favorite downtown Chinese restaurant during the [Napa Valley] Mustard Festival at Copia, despite the fact the event was being held almost a half-mile away. I circled the area more than once, finally finding an open parking space nearly four blocks distant. Cars were everywhere but with few people on downtown streets except in the Oxbow district.

The downtown Napa parking situation is likely to get far worse before it gets better, given the rapid pace of downtown development. I think this will occur despite the additional millions being invested by the City and County in a fourth parking garage and some private parking investment. No sane movie theater manager offers cheap admission on Friday or Saturday night, but the equivalent is happening 365 days per year in most U.S. cities, including downtown Napa. The most convenient locations along the curb in front of stores on 1st Street, or in front of the Courthouse, are given away free to those clever enough to quickly grab these spaces and evade the "parking nazis" (sic). With that 4th garage, taxpayers will be giving away free the use of \$30,000 spaces to County workers and those with County business again to those clever enough to grab open spaces before the competition. Ironically, adjacent businesses have paid \$30,000 for space in the garage for their use.

This is a huge waste. Dr. Donald Shoup of UCLA, the leading academic authority on parking, says that off-street parking mandates collectively cost business anywhere from \$135 to \$340 billion annually. Dr. Shoup estimates a collective loss of more than \$1 million per year in L.A.'s Westwood Village (adjacent to UCLA) in time and wasted fuel due to drivers circulating around the block looking for open spaces. The fact that 99% of U.S. vehicle trips have "free" parking also encourages excessive driving with all the negative congestion and environmental consequences.

Dr. Shoup's solution is to bring back parking meters and other parking charges, but in a manner radically different from the traditional City approach of pocketing parking revenues into the General Fund. Shoup's first insight is to apply proven capitalist principles in a manner that any businessperson or citizen can understand. That is, like movie theaters and airlines, charge for, and vary rates based on, times and locations of peak demand. Perhaps in a low demand part of downtown one would pay \$0.25 per hour, while at First & Main in front of the Opera House, at peak times the going rate is \$2.00 per hour. Dr. Shoup's key goal is pricing that ensures 15% of spaces are open at all times, the level generally seen by parking experts as adequate.

Dr. Shoup's second brilliant insight is that implementing new paid parking districts is much more acceptable to the local neighborhoods if those neighborhoods get all, or at least the lion's share, of the benefit from new parking revenues. In downtown Napa, this may mean covering existing expenses for the current three garages and other programs now paid from non-downtown sources (e.g., the Trolley means other local buses are less frequent). New revenues would allow sidewalk improvements, regular cleaning, upgraded security, improved Trolley service, and other downtown amenities. An increasingly upscale clientele is now landing in downtown Napa. If one is spending \$100 on lunch for two, or \$500 on clothing and shoes or a case of wine, what's another \$2.00 in the meter if visiting downtown is now more convenient?

The High Cost of Free Parking

Donald Shoup

Friday, June 3, 2005

Paving an entire state for a parking lot sounds outrageous. But because there are at least three parking spaces for each of the 230 million vehicles in the United States, the total space devoted to parking in America amounts to an area about the size of Connecticut.

Parking is free to the driver for most vehicle trips. Free, but not cheap. According to evaluations by Mark Delucchi of the University of California at Davis, we spend about as much to subsidize off-street parking as we do on Medicare or national defense. The additional driving encouraged by free parking also increases traffic congestion, air pollution and accidents. To fuel this extra driving, we import more oil, and pay for it with borrowed money.

Why do we have so much free parking? The short answer is that most cities require plentiful off-street parking for all new buildings. These off-street parking requirements often produce a surplus of available spaces, even during the peak shopping season. A 1999 study by the Urban Land Institute found that parking lots at 43 percent of shopping malls were never more than 85 percent occupied even the week before Christmas.

San Francisco differs from most cities by putting a cap on the number of parking spaces downtown. For a convention center, Los Angeles requires, as a minimum, 50 times more parking spaces than San Francisco allows as the maximum. As a result, Moscone Center anchors a pedestrian-friendly redevelopment area, while the L.A. Convention Center is surrounded by an ocean of parking spaces.

Even in San Francisco, however, 93 percent of all curb spaces are free, and the metered curb spaces are priced well below off-street rates. One survey found that the average price of downtown curb parking is only 20 percent of the price of adjacent off-street parking. This underpricing creates a problem, because drivers cruising in search of cheap curb parking add to traffic congestion and air pollution. Studies of cruising in downtowns have found that up to 74 percent of traffic was searching for parking, and the average time to find a curb space ranged up to 14 minutes.

Cruising is a common problem in San Francisco. A study on West Portal Avenue conducted by Robert Saltzman of San Francisco State University found that average cruising time to find a curb space was 3.2 minutes. For one driver, this does not seem like much time, but when you add up all the cruising by everyone who parked in the area during a day, it can add up. A similar study in Westwood Village in Los Angeles showed that over a year, cruising generated nearly 1 million excess vehicle miles of travel -- equivalent to 38 trips around the Earth.

City planners have tried to prevent cruising by requiring every new building to provide off-street parking, but everyone pays for this parking in countless, unseen ways. Most cities require commercial buildings to provide a parking lot larger than the floor area, and for restaurants the parking lots are often at least three times the size of the dining area. The cost of these parking spaces has to turn up somewhere, usually as higher prices for everything we buy. Even those who walk, bike or ride public transit pay for parking indirectly.

What can cities do to reduce the high cost of free parking? Here are two recommendations:

-- First, cities should charge the right price for curb parking, so that about 15 percent of spaces are vacant. That way, drivers will always be able to find one or two open curb spaces per block, and no one will cruise. We can call this the Goldilocks price. If no curb spaces are vacant, the price is too low, and if many spaces are vacant, the price is too high. If about 15 percent of the spaces are vacant, the price is just right. Parking is like gasoline: Cars use it, so drivers should pay for it.

-- Second, cities should return all the increased meter revenue to the metered districts. The parking revenues can pay to clean and repair the sidewalks, light the streets, remove graffiti, plant trees, provide security and put utility wires underground in the metered districts. These public improvements will attract even more customers, some of whom will walk from the surrounding neighborhoods.

These policies have helped to turn the Old Pasadena district in Southern California from a skid row to the region's premier shopping destination. Parking meters provide \$1.2 million a year for public improvements in the area, and customers can always find a convenient place to park.

"The only reason meters went into Old Pasadena in the first place was because the city agreed all the money would stay in Old Pasadena" said Marilyn Buchanan, chair of the district's parking advisory committee. "We've come a long way. This might seem silly to some people, but if not for our parking meters, it's hard to imagine that we'd have the kind of success we're enjoying. They've made a huge difference. At first it was a struggle to get people to agree with the meters. But when we figured out that the money would stay here, that the money would be used to improve the amenities, it was an easy sell."

How can San Francisco return meter revenue to the neighborhoods that generate it without shortchanging the rest of the city? It can give any increases in parking meter revenue to the neighborhoods that want to raise meter rates or extend meter hours. This way, the city won't lose any existing meter revenue, but neighborhoods will have a reason to support charging market rates for curb parking.

No one wants to pay for curb parking -- that will never change -- but if cities spend the revenue to pay for public services next to the parked cars, many people will begin to see the advantages of charging for curb parking. The potential revenue is enormous in San Francisco, which, according to the Department of Parking and Traffic, has more cars per square mile than any other city in the nation. If the city shares the increased parking revenue with the metered areas -- so that drivers can always find a convenient place to park at their destination -- market-rate prices for curb parking look like a good idea for neighborhoods, the economy and the environment.

Donald Shoup is a professor of urban planning at UCLA and author of "The High Cost of Free Parking," published in March by the American Planning Association. More information is available at www.bol.ucla.edu/~shoup.

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Summary of Recent Low Cost U.S. Regional Rail Projects

	Length in Miles	Capital Cost	Capital Cost/Mile	Service	Service Frequency	Estimated Weekday Ridership	Estimated Operating Expenses	Notes
Nashville - East Corridor Music City Star	31.0	\$41,000,000	\$1,322,581	Peak Only	2-3 trips each peak	1,400	\$3,500,000	Light freight traffic; used equipment from Chicago; cost does not include ROW purchase
Albuquerque - RailRunner	48.0	\$85,000,000	\$1,770,833	All Day	2-3 trips each peak; 1 midday trip	2,500	\$10,000,000	Light freight traffic; extension to Santa Fe now under construction; ROW purchase from BN Santa Fe: \$50 million
Austin - Capital Metro Rail	32.0	\$120,000,000	\$3,750,000	Peak Only	30 min	2,000	\$6,000,000	Light freight traffic
Portland - Washington Co. Commuter Rail	14.7	\$117,300,000	\$7,979,592	Peak Only	30 min	4,000	\$5,000,000	Light freight traffic
Salt Lake City - FrontRunner	44.0	\$611,700,000	\$13,902,273	All Day Mon Sat	30 min All Day 5-12am	5,900	\$15,500,000	175 miles of UP trackage purchased in 2002; cost includes ROW purchase
Oceanside - Escondido - Sprinter	22.0	\$477,000,000	\$21,681,818	All Day	30 min wkdy, 60 min wknd	11,600	\$11,000,000	Includes ROW purchase and 1.5 miles of elevated trackage

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M.V. Zinfandel at the Kennedy Park bend with the old State Hospital in the background.

