



SMART's Impact on Air Quality

White Paper No. 7

Transportation – and primarily automobile transportation – not only accounts for 60 percent of all the greenhouse gas emissions produced in Marin and Sonoma counties, but most of the smog and soot air pollution as well. In fact, it's fair to say that pollution from cars is one of the bigger threats to our health and quality of life in the North Bay. SMART, while creating a new alternative for travel in the Highway 101 corridor, will have a beneficial impact on the quality of our air.

As noted in SMART's Final Environmental Impact Report, by replacing more than 5,000 vehicle trips per day with rides on rail cars powered by modern clean-diesel fuels, SMART will prevent more than 30 million pounds of greenhouse gases from entering our air each year. That's equivalent to removing 50,000 cars *completely off our roads* in the first 20 years of the train's operation, according to the U.S. Environmental Protection Agency.

Those benefits don't include the thousands of walking and bicycling trips forecast to be taken on SMART's adjacent 70-mile bike and pedestrian trail. Nor do they take into account the transformative ability of SMART to become the backbone of a complete alternative transportation system that links thousands of residents to a network of buses, shuttles and ferries. (For further discussion of SMART's ability to change the region's transportation habits, see White Paper No. 2.)

A reduction in greenhouse gases, however, is not the sum total of the air quality benefit that the train will provide. It also will also reduce a variety of hazardous pollutants, from ozone to particulate matter, produced by our auto-dependent lifestyle. While greenhouse gases have received increased attention in recent years, "smog" is what comes to mind when most people think of bad air. The stuff that hangs like a pall over some areas on particularly still days is actually ozone, which is not emitted directly into the air. Instead, ozone is formed in the atmosphere by complex chemical reactions between nitrogen oxides and reactive organic gases (ROG) in the presence of sunlight. Ozone formation is greatest on warm, windless, sunny days. Because of the reaction time involved, peak ozone concentrations can often occur far downwind

from where the precursor emissions were generated. Therefore, ozone is a regional pollutant that often impacts a large area.

Ozone can irritate the eyes and aggravate respiratory disease, hasten the aging of lung tissue and reduce the body's ability to resist colds and other infections. Unfortunately, it is projected that global climate change will likely make the ozone formation problem much worse.

Motor vehicles are the largest source of ozone precursors. In our region, transportation control measures (TCMs) – designed to reduce motor vehicle use – have been an important part of the strategy for reducing ozone precursors. The Bay Area Ozone Strategy includes a list of twenty TCMs, including such items as voluntary employer-based trip-reduction programs, the expansion of carpool and express bus lanes and improved bus, ferry and rail service.

This is where SMART comes in. By removing cars from the road, SMART further reduces ozone precursors from the atmosphere of the North Bay.

On a more localized level, particulate matter also is an air-quality concern, because it can enter the body and become lodged in the lungs. Particulate matter can include a large range of solid and liquid particles, including smoke, dust and aerosols.

SMART's clean diesel trains will use modern, ultra-low sulfur diesel fuel. By reducing the sulfur content in diesel fuel *from 500 parts per million to 15 parts per million*, these new fuels allow the use of pollution-control technology that includes catalyzed diesel particulate filters, which greatly reduce particulate emissions. Combined with fewer cars on the road as drivers switch to riding the train, SMART will make a significant reduction in particulate matter in the air near the rail and Highway 101 corridor. By getting drivers out of cars and onto trains using clean diesel fuel, SMART will reduce particulate matter by approximately 80 pounds per day.

Clean diesel engines also reduce nitrogen oxide emissions, further reducing ozone formation.

SMART is evaluating the availability and prospects for the use of diesel-electric hybrid train engines, a newly emerging technology. The SMART Board has been clear in its desire to make the train as clean and green as it can possibly be. (For information about SMART's trains, see White Paper No. 6 -- "SMART's Clean Diesel Trains.")

The power and promise of the SMART train and pathway project, however, lies not in its use of cleaner fuels, but its ability to take thousands of cars off the road each and every day.

For more information about SMART, go to www.sonomamarintrain.org or call SMART's information lines in Marin, 415-419-3510, or Sonoma, 707-583-2323.