

The Southwest Region Fleet Transportation (SWRFT) is a regional organization comprised of Garrison Mobile Equipment fleets located at seven Marine Corps Installations in California. These installations include Marine Corps Base Camp Pendleton, Marine Corps Recruit Depot San Diego; Marine Corps Air Station Miramar, San Diego; Marine Corps Air Station, Camp Pendleton, San Diego; Marine Corps Air Ground Combat Center, Twentynine Palms; Marine Corps Logistics Base, Barstow; and Mountain Warfare Training Center, Bridgeport. The Fleet Managers at each of these locations comprise a team that is dedicated to reduce oil based fuel usage. The driving factors behind this united effort are to reduce air pollutants, reduce other transportation waste streams, reduce our dependence on foreign oil, and increase the efficiency of each vehicle operated to support our mission. The goal of meeting these factors requires the SWRFT Team to identify, understand, and employ cutting edge technology and products along with proven alternative fueled vehicles which give them the best opportunity for success. The SWRFT Team has been quite successful in employing the innovative techniques and products described below, and achieving their goal of reducing pollutants.

Alternative Fuel Vehicles (AFVs) are designed to use a fuel other than, or combined with, petroleum based fuel. The goal of employing AFVs is reducing the overall production and emission to the environment of hazardous greenhouse gases and particulate pollutants. To obtain a significant reduction in nitrous oxide, carbon monoxide, and methane; the team employs a variety of vehicles that use alternative fuels such as compressed natural gas (CNG), electricity, and bio-diesel. The vehicle power plant technology includes internal combustion engines, electric motors, and a combination of both known as a hybrid. Following is a list of the AFVs currently employed by the SWRFT:

Compressed Natural Gas (CNG)	- 542
Electric	- 293
Gasoline/Electric Hybrid	- 21
Flex Fuel Ethanol (E-85)	- 367 (Pending CARB approval, currently no E-85 fuel available in Ca.)

Other products and management techniques that the SWRFT Team currently employs to reduce pollution and increase vehicle efficiency include the following:

- Biodiesel Fuel (B20) – By requiring the use of B20 biodiesel is all equipment that uses diesel fuel, the Team has reduce the consumption of it's petroleum diesel fuel by 20%. B20 biodiesel consists of 80% ultra low sulfur diesel and 20% renewal energy source such as soybean oil. This fuel blend has little effect on horsepower, fuel economy, and engine performance. Therefore, the 20% non-petroleum product effectively results in a 20% reduction in diesel engine emissions and particulate matter generation. This is a significant reduction in pollutants as the SWRFT has 817 diesel engine vehicles and consumes 1.3 million gallons of biodiesel a year.
- On-Board integrated wireless location and performance monitoring device – This device attaches to the vehicle's computer monitoring engine performance and speed while using GPS technology to monitor location. This information is collected 24 hours a day, 7 days a week, and is transmitted wirelessly via cellular transmission to a collection point that is readily accessible via a web-based interface. Monitoring engine performance has allowed the Team to quickly identify and repair a vehicle's engine that is not performing properly and emitting excessive pollutants. Monitoring the vehicle's speed has provided a tool to improve driving habits, reduce excessive speeds, and reduce fuel consumption and associated hazardous emissions. Location monitoring has reduced unnecessary trips and improved route planning which also results in efficient fuel consumption and reduction of pollutants. A 27% reduction in

excessive speed reports indicates a significant reduction in higher speeds and the associated inefficient fuel consumption, also resulting in fewer emissions.

- Vehicle cabin video/audio monitoring device – This device attaches to the vehicle’s windshield and is used to monitor both the area ahead of the vehicle and the vehicle’s cabin area. The device continuously observes via video and audio the activity ahead of and within the vehicle. When the device receives a force (front, back, left, or right) that exceeds a specified level, a 30 second event is captured and saved. At designated times; the captured events are downloaded to a central location for review. These events are used to coach vehicle operators to improve their vehicle operating habits, behaviors, and techniques. By improving operator habits and reducing aggressive driving behaviors, the fleets are able to improve fuel consumption efficiency and reduce premature tire wear. A 33% reduction in captured events indicates a prominent reduction in aggressive driving that directly results in increase fuel efficiency and a reduced generation of pollutants.
- Tire pressure monitoring devices – Team members have ensured these devices are mounted on the medium and heavy duty vehicles and provide an easy means for vehicle operators to monitor and maintain proper air pressure in tires. Under inflated tires result in increased friction and heat between the road and the tire. This increases fuel consumption and tire wear resulting in increased emissions and waste tire cores.
- Retread tires – Tires that are properly maintained during their life with little wear or damage to the core can have the tread restored, and the tire can be put back into service for another life span. Ensuring this technology is applied where ever possible; the Team members are greatly reducing the waste tire volume.
- Wind deflector – The SWRFT Team members of grasped every opportunity to install devices on trucks and trailers that divert the air around and over the equipment as it is operated, reducing the resistance cause by that wind. Reducing this resistance again increases fuel efficiency and reduces emissions.
- Road Ahead – Hydrogen Fuel Cell and Hydrogen Internal Combustion Engine (ICE) Vehicles – Our efforts are to exploit hydrogen fuel cell technology and the increased use of hydrogen as a fuel. Hydrogen fuel cells and Hydrogen ICE drastically reduce hydro-carbon emissions while retaining a comparable level of vehicle performance. Marine Corps Base Camp Pendleton is finishing the construction of a hydrogen fuel station (natural gas reformer) which supports the State of California’s desire to create a hydrogen highway along the Interstate 5 corridor. This facility will fuel prototype fuel cell and ICE vehicles that the Base will begin testing and utilizing in daily fleet operations in the Spring of 2008. The H2 station has the potential to fuel commercial and private hydrogen fuel cell/ICE vehicles in the future.