

Propane Fleet Case Study  
Knox County Community Actions  
Committee (TN)

THE SOUTHEAST REGIONAL  
**ALTERNATIVE FUELS**  
MARKET INITIATIVES PROGRAM



## Overview

Since 2004, the Knox County Community Actions Committee (CAC) has added 22 propane bi-fuel Ford F-450 17-passenger cut away chassis vehicles to their existing fleet. By initiating this project, CAC hoped to save money on fuel and help the environment.

## Program Participation

CAC was supported in this project by funding from CMAQ. CAC received 6-8 unique CMAQ grants for different amounts in addition to purchasing the vehicles through FTA Section 5310.

## Project Motivation and Implementation

CAC's enthusiasm for this project came from their desire to establish fuel cost savings, lower emissions, and become more proactive in the transit market; they wanted to be on the cutting edge of new vehicle technology.

Knox County Fleet Management, who controlled the LPG fueling station, assisted CAC in this project along with ETCleanFuels executive director Jonathan Overly; Overly provided consultation services via payback scenarios, emissions analysis, and grant writing.

Implementing this project was a multi-step process for CAC. First, the Committee put the 22 vehicles out for bid prior to receiving them. Knox County then assisted with installing the LPG fueling station. CAC also had to be trained to refuel and operate the LPG vehicles.

Since 2004, CAC has worked with three different companies on this project. The first company eventually became defunct, which led CAC to company two; problems with deploying LPG-dedicated vehicles and other issues related to company two led CAC to switch the focus of this project to bi-fuel vehicles and a third company. Currently, all bi-fuel vehicles in CAC's fleet are not running on propane due to a variety of issues.

CAC encountered a good number of barriers with this project. These included lack of support during vehicle malfunctions, vehicle overheating, decrease in mileage, fear of vehicle failure, lack of refueling options, labor and repair costs, fuel tanks not being designed for hills, lack of replacement tanks, and quantity of vehicle malfunctions.

## Fleet Facts

### Organization:

Knox County Community Actions Committee (TN)

### Director, CAC Transit and Mobile Meals Kitchen:

Karen Estes

### Industry Type:

Government

### Conversions Began:

2004

### Propane Vehicles Converted:

22 LPG bi-fuel Ford F450 17 passenger cut away chassis

### Estimated Petroleum Displacement:

40,000 – 50,000 gallons

## Results

The biggest reward CAC gained from this project was experience dealing with alternative fuels. CAC trusts that bi-fuel systems are generally good for fleets even if they had a bad experience themselves; CAC believes they made progress for others in the future. Transit Director Karen Estes says, "We think it's crucial that we seek alternative methods. We may have been ahead of the game too soon."

CAC estimates they saved 40-50 thousand gallons of petroleum during the 10 years the project was active. Their emissions reductions were consistent with those claimed by the vehicle companies; CAC decided not to perform any further data gathering or research. In terms of cost savings, CAC unfortunately lost money on the project due to higher purchase prices and vehicle maintenance issues. While the propane fuel pricing itself was beneficial compared to gas/diesel prices, this could not make up for all the other costs CAC incurred.

While CAC struggled with cost savings and return on investment through this project, Estes does believe deploying propane vehicles boosted their public image. She notes that Knox County also considered propane vehicles since fuel pumps were already put in on CAC's behalf. Estes feels that CAC's project gave Knox County a chance to evaluate what they could use.

## Lessons Learned and Next Steps

The hardest part of the process for CAC was writing the specifications for the vehicles. They had to evaluate the different fuel options and evaluate Knoxville's terrain and hills. Propane was the only fuel tested to respond well to the hills and valleys that are present in Knoxville.

Estes says that before switching to any alternative fuel, be sure to check out all the different types of systems and how many facilities can support the system you're interested in. Also, she recommends locating locally available support, buying from companies that supply parts in America, and keeping your options open; be sure to keep the gas/diesel system intact in case you need to revert back to the old system.

When asked about CAC's future plans for reducing petroleum use, Estes replied, "We will continue to look for options. As we find alternatives that have been proven, tested, and will meet our needs, we will look at ways to purchase them. Anything to help the environment is also in our best interest. I think in the last 10 years, natural gas and propane are a lot more available than they were. The industry is getting there."

For more information on this and other alternative fuel and advanced technology vehicle programs contact Kristy Keel-Blackmon, Project Facilitator at the East Tennessee Clean Fuels Coalition, by phone: 865.974.9665 or via email at [kristy@etcleanfuels.org](mailto:kristy@etcleanfuels.org). The East Tennessee Clean Fuels Coalition is a designated Clean Cities Coalition by the U.S. Department of Energy.



**CAC** Knoxville - Knox County  
Community Action Committee  
*Helping People. Changing Lives.*

For specific information regarding the Knox County project, contact Karen Estes, Director, by phone: 865.524.0319 or via email at [Karen.estes@cactrans.org](mailto:Karen.estes@cactrans.org).