

# **Successes and Challenges in the Resale of Alternative Fuel Vehicles**

**July 2001—March 2002**

*Dorfman & O'Neal, Inc.  
Washington, D.C.*



**NREL**

**National Renewable Energy Laboratory**

1617 Cole Boulevard  
Golden, Colorado 80401-3393

NREL is a U.S. Department of Energy Laboratory  
Operated by Midwest Research Institute • Battelle • Bechtel

Contract No. DE-AC36-99-GO10337

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NREL Technical Monitor: Margo Melendez

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# Executive Summary

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## Background on Auctions

Auctions provide an exceptionally rapid, effective, and efficient market for the transfer of property between buyers and sellers at reasonable prices. The first automobile auction in the United States was successful because used cars were in reasonably constant supply, were uniformly packaged, and were easily graded for quality. Also, the auction had sufficient volume to significantly lower the handling and transaction costs for wholesalers and dealers.

To this day, the automobile auction industry conducts business primarily with registered wholesalers and dealers. Except for the U.S. General Services Administration (GSA) auctions and some consignment auctions, nearly all automobile auctions are closed to the public.

The auction system represents a near-perfect market, validated by the lack of statistical price differences in value of specific model cars between various regions of the country. However, specialty cars may be subject to arbitrage—the buyer purchases the vehicle believing that it can be sold immediately at a profit in another region.

A variety of vehicle pricing services are available to serve the consumer and the wholesale automobile industry. Each has a different philosophy for collecting, analyzing, and reporting data. *The Automobile Lease Guide (ALG)* is clearly the authority on vehicle residual values.

Auction companies continue to apply automated technologies to lower transaction costs. Automated technologies are the only way to track the increasing number of transactions in the growing industry. Nevertheless, people-to-people relationships remain critical to the success of all auction companies.

Our assessment is that everyone in the secondary automobile market is aware of alternative fuel vehicles (AFVs) and is interested to watch how the wholesale market for these vehicles may develop. However, none of the industry representatives we interviewed appears to be willing to take a leadership role in this market.

Exact figures are not publicly available, but the GSA is probably the largest reseller of bi-fuel and dedicated compressed natural gas vehicles. These vehicles number in the hundreds; the total number of vehicles disposed by GSA each year is more than 20,000. GSA representatives have stated that bi-fuel vehicles are selling at approximately 80% of *Black Book* national average and dedicated vehicles are selling at 60% of *Black Book* national average compared to gasoline-only vehicles.

## **Focus Group Comments**

The current inventory of natural gas and propane vehicles available to the resale market largely comprise outdated aftermarket conversions that have outlived their useful lives and have little resale value. The number of original equipment manufacturer natural gas and propane vehicles in the resale market has not reached “critical mass” worthy of the automotive industry’s attention.

Another requirement for establishing a viable AFV resale market is to track vehicle mileage, condition, and resale prices. Unfortunately this information is not centrally cataloged. None of the auction associations or reporting guides track AFV resale data, and GSA considers this fleet information to be proprietary.

The funds GSA obtains from reselling government owned vehicles are critical to GSA’s purchase of new vehicles and financial stability. GSA was sufficiently concerned about poor resale values that it created a new Remarketing Division. This division’s job is to coordinate the national remarketing program for conventional vehicles and AFVs.

Because of the comparatively low volumes of AFVs produced by manufacturers and the small numbers requested by lessees, the major leasing companies cannot provide any significant data on AFV use. The private sales of AFVs to or between individuals are hardest to document because the AFV resale market is decentralized. There is currently no methodology to track these transactions. The transactions are therefore inaccessible to the publishers of resale guides.

## **Conclusions and Recommendations**

AFVs cannot reasonably be remarketed within the framework of the traditional automobile resale auction, primarily because they are not in reasonably constant supply and the market demand for AFVs varies dramatically by region.

The study produces six specific recommendations as next steps:

1. Develop a comprehensive list of potential AFV buyers and sellers.
2. Foster a closer working relationship between the Clean Cities Program and GSA’s Remarketing Division.
3. Establish a task force to construct an online AFV resale Web site.
4. Establish a task force to develop methodology for recording and disseminating AFV resale transactions.
5. Develop strategies to extend AFV rebate programs to include used AFVs.
6. Develop strategies to promote the wider introduction of HOV-1 and green curb programs for new and used AFVs.

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## Introduction

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This report provides the outcome of Dorfman & O'Neal's effort to examine the resale market for automobiles as it relates to the resale of late-model, original equipment manufacture (OEM), alternative fuel vehicles (AFVs). During the course of our study, we conducted basic literary research, one-on-one interviews with industry managers and employees, and four focus groups of AFV owners and stakeholders.

A recurring theme throughout the course of the study was the need to integrate the transfer of AFVs into the wholesale automobile auction system—the way most conventional vehicles change hands. Clearly, most AFV stakeholders had no knowledge of the wholesale automobile auction process. Therefore, we first introduce the reader to the beginnings, development, and future of this industry.

Following the background on the wholesale automobile auction process, we summarize the results of four Alternative Fuel Vehicle Focus Group meetings that were held in late Spring and early Summer 2001 in Los Angeles, Denver, Providence, and Philadelphia.

In the final section, we discuss the conclusions and recommendations of our research.





## History of Automobile Auctions

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### *A. History of Auctions*

Auctions provide an exceptionally rapid, effective, and efficient market for the transfer of property between buyers and sellers at reasonable prices. All auctions are either regularly scheduled or preceded by a public announcement of the auction time and place.

Sellers have a limited period to bring their products to the auction location. Prospective buyers also have a limited time to evaluate the property being sold. At the appointed time and place, the auctioneer, who is usually the agent of the seller, conducts the auction. Prospective buyers bid progressively higher prices for the property until the auctioneer is satisfied that the highest price has been offered. Following the auction, buyers are responsible to pay for and remove the property from the auction location. The auctioneer is paid a fee or percentage of the sale, depending on the rules of the auction.

The first recorded auctions, for the sale and purchase of slaves, took place in Greece between 850 BC and 480 BC (*Encyclopedia Britannica*). Although the worldwide slave trade was the impetus for the development of auctions, the industrial revolution and the growth of trade between the American colonies and Europe provided the stimulus to expand greatly the types of products that could be successfully auctioned.

In the United States, farm products are probably the most typically auctioned items. Commodities and stock exchanges are examples of other types of auction processes that operate very efficiently without a clearly visible auctioneer.

### *B. Beginnings of a Service Industry*

In the late 1930s, a few entrepreneurs realized that if auctions could be used to sell cattle, horses, machinery, and other goods, they certainly could be used to sell cars. The first automobile auction in the United States was held in March 1938. It was the brainchild of J.M. "Martin" Rawls, co-owner of Rawls Auto Sales in Columbia, South Carolina (Bunch, 4).

Used cars were in short supply in the South during the depression. Many dealers went north to find cars, towing them back through the mountains. The Rawls Auto Auction, and other auctions that soon followed, provided a more efficient way to sell these cars.

Wholesalers and dealers could schedule a meeting at a set place to transact business. Rawls Auto Auction charged \$5.00 for every car sold and \$2.50 for each one not sold (Bunch, 5). Soon Rawls was auctioning more than 150 cars per week. The Rawls Auto Auction was successful because used cars were in reasonably constant supply, uniformly packaged, and easily graded. Moreover, the auction had sufficient volume to significantly lower handling and transaction costs for wholesalers and dealers.

To this day, the automobile auction industry conducts business primarily with registered wholesalers and dealers. Except for U.S. General Services Administration (GSA) auctions and some consignment auctions, nearly all automobile auctions are closed to the public.

Many of the biggest names in the automobile auction industry started in the late 1940s when the end of World War II created high demand for new cars and dealers needed an efficient way to dispose of trade-ins and slow-moving cars. The original (and now world's largest) automobile auction, Manheim Auto Auction in Manheim, Pennsylvania, was founded in 1947. The National Auto Auction Association estimated that by 1950 more than 100,000 cars were being auctioned annually (Bunch, 7). Although independently owned auction houses dominated the auction industry through the 1950s and 1960s, many of these business owners recognized the need for a national organization to represent the industry. The National Auto Auction Association, founded in 1954, developed for its members industry-specific insurance programs, and recommended standards of ethics, promotional materials, training programs, and marketing programs.

### ***C. Industry Growth Forces Modernization***

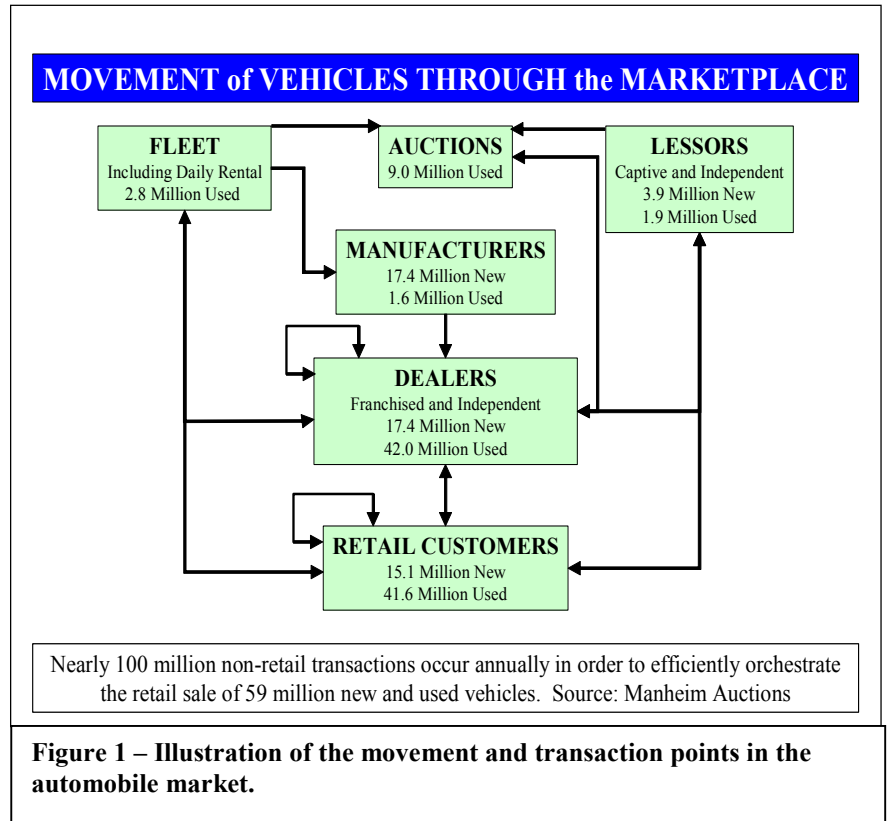
The 1960s were a period of strong growth for the automobile auction industry as automobile manufacturers began using auctions to dispose of “buy-back” rental and company cars at auctions open only to franchised dealers. These sales were initially small, but the auctions were highly successful and represented a major new market for the industry. Manheim Auto Auctions seized this new opportunity by purchasing the National Auto Dealers Exchange in New Jersey (Bunch, 13) in 1965. The age of chain-owned automobile auctions had dawned. Manheim, now owned by Cox Enterprises, Inc., became the largest automobile auction house. Manheim now operates 116 automobile auctions worldwide, employs more than 34,000 people, and sells more than 6 million vehicles annually (Webb).

Consumers in the 1970s and 1980s increasingly preferred to lease rather than purchase automobiles. Consumer leasing accelerated in the late 1980s. Two- and three-year lease programs created large volumes of vehicles in excellent condition that needed to be sold as they came “off lease.” The leasing companies, banks, savings and loans, credit unions, and finance companies that held the leases on these cars needed an efficient way to dispose of this expanding inventory. Consigning these cars through auctions was a logical solution.

The automobile manufacturers also contributed to the explosive growth of the lease resale market with “nearly new” cars coming from captive national rental fleets. At the same time, engineering improvements by automobile manufacturers increased vehicle life expectancy, slowing the scrappage rate of used cars and increasing used car sales through auction houses.

One common method for measuring the efficiency of the automobile marketplace is to calculate the average number of wholesale transactions required for a car to reach the retail market. Tom Webb, chief economist at Manheim Auctions, reports that, on average, there are about 1.6 wholesale transactions for each retail transaction in the marketplace (Webb). Figure 1 shows the movement of vehicles through the marketplace and illustrates where transactions take place.

The National Auto Auction Association reported in 1997 that the volume of cars auctioned in North America almost equaled the number of new cars sold, with a market value in excess of \$70 billion (Bradsher). The automobile auction industry responded to this increase by expanding and modernizing facilities to meet the needs of the increasingly sophisticated group of buyers (Figure 2).



At the Manheim Auction located in Manheim, Pennsylvania, 15,000 automobiles can change hands each Friday. The speed of the auctions is remarkable. Most vehicles are sold in seconds. The seller is identified through a series of hand gestures and other signals while the auctioneer rattles off prices (Bradsher). The business is built largely on trust. Before bidding begins, buyers typically examine for less than a minute a vehicle on which they plan to bid. “When a seller disposes of even a few defective vehicles, it is widely talked about within weeks, and buyers simply refuse to bid on the seller’s cars, or bid low” (Bradsher).



**Figure 2 - Lanes at a Manheim Auto Auction**  
Source: Manheim Auto Auctions web page.

George E. Hoffer, an economist at Virginia Commonwealth University who specializes in automotive retailing, observes that used car auctions are very cost efficient, with auction fees typically amounting to just a few

hundred dollars per vehicle. The auction system also represents a near-perfect market, validated by the lack of statistical price differences in value of specific model cars between various regions of the country.

Although Hoffer's observations are true for most cars at the auction, specialty cars may be subject to arbitrage—the buyer purchases a vehicle believing it can be immediately resold at a higher profit in another market (Hoffer). For example, used pickup trucks may be especially popular in Colorado but less so in the Northeast. A pickup truck purchased in the Northeast for \$11,000, plus \$195 in auction fees, may be sold for \$13,500 in Colorado. Even with shipping costs, this vehicle will still net the dealer a handsome profit (Bradsher). These opportunities often close quickly, however, as others recognize and react to these market opportunities (Hoffer).

#### ***D. Standardization of Residual Values***

What is an automobile worth? Dealers, wholesalers, banks, leasing companies, and consumers all want to answer that question before buying or selling an automobile. At the consumer level, automobile dealers post prices on vehicles, fully expecting that negotiation will reduce the final price paid. The final price depends on the negotiating position, knowledge, and skills of the salesperson and the buyer. For new car sales, the final price will also reflect manufacturers' incentives to the dealerships to sell specific vehicle models.

The first rule about vehicle pricing is that no standard prices are available. The price for a vehicle remains the result of the negotiation between what the seller is asking and what the buyer is willing to pay. This rule applies to every transaction during the life of a vehicle except possibly for the transfer of a new vehicle from the manufacturer to the dealer. To estimate the value of a vehicle, sellers and buyers need a guide to establish a reasonable range for negotiation.

In the early 1900s, a few automobile dealers realized the need for a pricing guide that provided a fair estimate of the value of any vehicle. These dealers began compiling lists of automobile prices and then periodically published the data within the dealership or to a group of cooperating dealers in a region. These lists gained credibility as fair and accurate reflections of current vehicle values as more and more dealers used them for pricing guidance. Pricing services are available from *Kelley Blue Book*, *Black Book National Auto Research*, the *National Automobile Dealers Association Official Used Car Guide*<sup>®</sup> *Company*, *Galves Auto Price List*, *Edmunds.com*, and others. These companies and their products report on the value of automobiles in the current marketplace.

The pricing guides are used for retail pricing, private party sales, wholesale pricing, and trade-in pricing.

**Retail** – Retail prices in the price guides reflect the average dealer asking price or transactions price for new and used cars for the nation or for a defined region. Typical services are the *Kelley Blue Book*, *Black Book*, and *National Automobile Dealers Association* (commonly referred to as *N.A.D.A.*).

**Private Party** – These transactions are usually between the high and low values assigned in the retail pricing guides.

**Wholesale** – Pricing services at the wholesale level provide dealers and other wholesale buyers and sellers with pricing from the wholesale auctions. These price guides are both national and regional in scope. Prices can reflect the winning bid prices or may be adjusted to include transportation, inspection, and auction fees. Prices that reflect these adjustments are the best approximation of the wholesale cost of a used car. *N.A.D.A.* and the regional *Black Book* are the best examples of this type of pricing service.

**Trade-in** – Pricing services also evaluate trade-in values of used cars as reported by retail dealerships. Some of the pricing guides consider wholesale and trade-in values to be the same. Others separate the values based on wholesale as being ready for auction or dealer ready and trade-in as being not ready for a dealer or wholesale auction. *Galves* and the regional *Black Book* are good examples of pricing services that distinguish between wholesale and trade-in values.

Each pricing guide has a different philosophy for collecting, analyzing, and reporting data.

*Kelley Blue Book* obtains its data from auction houses and dealerships that voluntarily report sales data.

*Black Book* advertises itself as the only guidebook to “quickly reflect the latest wholesale prices direct from the auction lanes” (*About Black Book*). *Black Book* sends survey staff to the auctions to make firsthand evaluations of the vehicles run in the auction lanes. They record the accepted bid for each vehicle, mileage, and trim levels along with an evaluation of the vehicle’s condition (extra clean, clean, average, or rough). Before publication, *Black Book’s* staff adjusts the values to consider models offered versus model demand, attendance at the auction, and other factors that affect the published price.

*Galves Auto Price List* is a regional guide that focuses exclusively on trade-in values in the Northeastern United States. Its market niche is the independent wholesaler that purchases vehicles from one dealer’s lot and sells them directly to another dealer.

We have mentioned a only a few of the many pricing guides available to the retail and wholesale automobile business. Each guide has its supporters and detractors. A single dealer, bank, or wholesaler may use several pricing guides during the normal course of business. Essentially, the users trust the evaluation of the guides in some circumstances and not in others.

A key point made clear by pricing guide employees interviewed during this study is that current values cannot be developed for a vehicle type or trim level if only small numbers of that vehicle are moving through the wholesale auto market. Generally, this is the situation with AFVs. Except for flexible fuel vehicles (FFVs) (those running on a mixture of ethanol and gasoline), too few have been moved to be evaluated by any pricing guides.

However, there is evidence that the pricing guides attempt to provide book values on low volume cars that do not have an active market. For example, only 313 Audi Quatro Coupes were sold in the United States in 1991 (*Automotive News*), yet *Kelley Blue Book, Eastern Region* provided a value for this vehicle in April 1992. Similarly, *Kelley* provided a retail value for the Audi 80 in April 1992 when only 1,772 vehicles had been sold in the prior year (*Automotive News*). Clearly, the pricing guides attempt to reflect the current market. However, the guides can obviously also provide estimates of market values for vehicles in the absence of an active market and in the absence of significant market volumes.

The pricing guides discussed so far provide evaluations of the current value of vehicles. The value of vehicles frequently changes and most guidebooks are published weekly to keep pace with the market changes and meet the demands of users. These guides are helpful for benchmarking the value of a vehicle in the short term. However, leasing, banking, and finance companies need to estimate prospectively a vehicle's market worth in 18 to 60 months. These companies turn to guides that attempt to predict the value of a vehicle at a point in the future.

The *Automotive Leasing Guide Company (ALG)*, based in Santa Barbara, California, has been predicting wholesale automobile auction values of automobiles at lease end since the 1960s (Adelson). The *ALG* is clearly the authority on vehicle residual values. "The finance divisions of Ford and General Motors use it exclusively to predict residual values, an all important figure indicating a vehicle's worth after the lease lapses in two to five years" (Adelson). The *ALG* is clearly the standard for predicting the future residual value of vehicles.

Like the current market price guides, the *ALG* does not list any AFVs that operate as bi-fuel, dedicated natural gas, or propane vehicles. The *ALG* has been commissioned by manufacturers to create a case by case, internal residual value for its own use as a guideline. The forecasts are based on assumptions given to *ALG* by the manufacturer and the result is not published or distributed (Cerruti). FFVs appear in the guide because they have been produced in large numbers and are leased in large numbers to consumers and fleets. However, such vehicles are not identified separately from their pure gasoline counterparts. The only alternative fuel-like vehicles listed in the *ALG* are the Honda Insight and the Toyota Prius (Nathanson).

## Automobile Auctions in the 21<sup>st</sup> Century

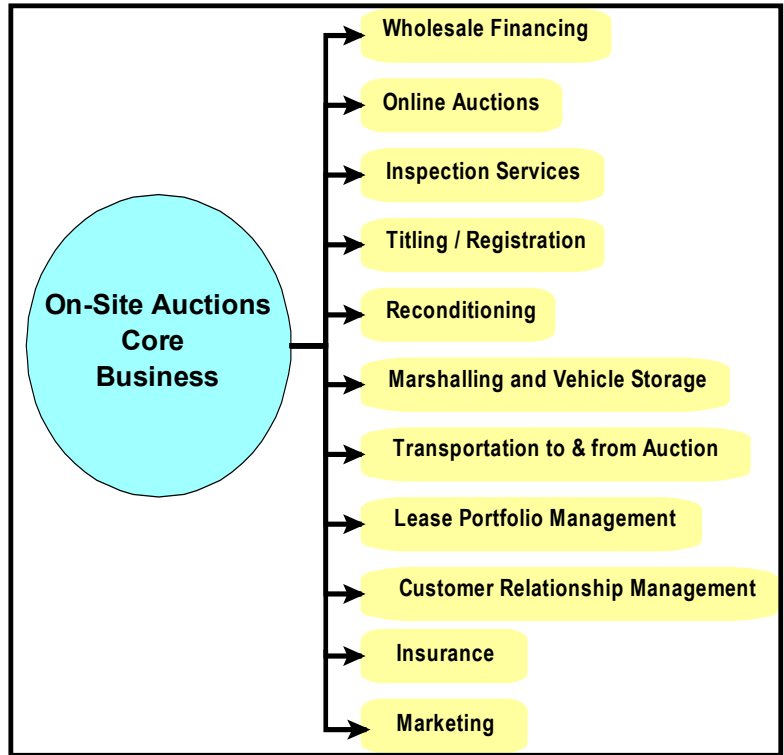
### A. Innovation

Manheim’s Tom Webb observes that, “Professional, dedicated remarketers are constantly looking for ways to increase the efficiency of vehicle inspection, reconditioning, title processing, etc. Furthermore, technology advances not only are bringing new efficiencies to the process, but are even making vehicles available for viewing and/or selling continuously throughout the process.”

Auction companies have grown by adding a host of ancillary businesses (Figure 3) built up around the core auction process. “Both sellers and buyers are attempting to outsource activities that are not within their core competencies and are looking for ‘one-stop shopping’ for all their re-marketing needs” (Webb). However, the core business of the auction, providing an efficient market for the transfer of goods, remains a very efficient process despite its labor-intensive characteristics.

Auction companies continue to apply automated technologies to lower transaction costs. Every stage in the auction process, from check-in to shipment, is supported by computer databases and transaction monitoring. This automation provides all the record keeping for every aspect of the auction. This data repository can be used to evaluate the transaction costs at an auction. The data can also be used to supply the various pricing guides with wholesale pricing information. Nevertheless, people-to-people relationships remain critical to the success of all auction companies.

As the auction has by necessity become more automated, the data repository has been used to provide the auction customers with more information. The flexibility of the



**Figure 3 – Examples of ancillary services and profit centers related to the wholesale auction industry.** Source: Manheim 2001 Used Car Market Report



**Lane at an Adesa Auction**

Source: Adesa Corporation web page.



Internet has enabled additional value added services in the auction industry. These services include advance booking of lanes and run numbers by sellers, pre-auction lists of available vehicles for buyers (Appendix), complete historical information on a customer's purchases and sales, after-auction lists of sales prices on vehicles, and sales of vehicles directly from dealer lots to registered users of the system. Some entrepreneurs are betting that they can transform the industry with new extended services.

Business-to-business Internet transactions are clearly bringing a higher level of efficiency to the business community and may transform the wholesale auction business in the next decade. However, it is more difficult to create a relationship of trust and honesty between the buyer and seller in such situations without person-to-person contact. Only positive experiences can cultivate this trust.

Auction companies and third party vendors are creating various online applications for conducting auctions over the Internet at specific sites or from the buyer's office computers. Auction Broadcasting Company, LLC, has developed a system using On-Line Ringman<sup>sm</sup> software that allows buyers to sit in a theater-like room and make bids by computer. Similar to video conferencing, the bidders view as many as six lanes of cars throughout the ABC network of auctions and purchase cars in real time.

AUTODAQ has taken a different approach by providing complete auction services directly over the Internet. It provides customers with searchable records of used car inventory and includes detailed information and third party inspection reports on each vehicle. This information is much more detailed than that available to the bidder at an on-site auction. The customer can post a bid or decide to purchase a vehicle for the price asked. Once the bid or purchase is made, AUTODAQ ships the vehicle and gives the purchaser two days to accept it.

Manheim Auctions reports that online sales at all wholesale auctions reached \$771 million in 1999 with 52,171 units sold. Manheim established its Cyberlot in 1996 with \$146,000 in sales with 62 units sold. Manheim, who also provides Cyberlot services to other auction houses, reported sales of \$1.4 billion in 2000, with 91,897 units sold (Webb). Although this represents tremendous growth in just 5 years, most of the 9 million cars auctioned each year are still auctioned the old fashioned way—with a wink or a nod from the buyer to the auctioneer. To the established auction companies, the Internet is another way to reach traditional dealer customers ... or, more pragmatically, a necessary burden in the age of the dot.com world.

Retail consumers have moved to the Internet to research new and used vehicles. Just like dealers, however, the public is slow to purchase vehicles over the Internet. They first want to test drive and inspect the vehicles. A partial solution to this issue is the use of a third party inspection service. One such company is LemonBusters, which provides online purchasers with professional vehicle inspection services nationwide at reasonable prices. LemonBusters runs a complete diagnostic test series and provides an inspection report. The cost of this service is less than \$200.

A common theme of Internet auctions is that the seller is trying to assure the purchaser that the vehicle will look and perform as advertised. Dealers and individuals using Internet auctions use a lot of text to describe the vehicles. Many include detailed photographs and some include third party inspection reports.

### ***B. Industry View on Alternative Fuel Vehicles in the Resale Market***

We interviewed a large cross section of industry leaders during our research. Many requested that their views on AFVs be quoted anonymously or used only as background.

Our assessment is that everyone in the secondary automobile market is aware of AFVs and is interested to see how the wholesale market for these vehicles may develop. However, none of the industry representatives we interviewed appear to be willing to take a leadership role in this market. These leaders consistently stated that the wholesale used car marketplace has no interest in AFVs until a critical mass is achieved.

Similarly, the leasing industry has little interest in AFVs. Leasing companies, banks, and finance companies rarely lease vehicles to fleet or private customers on a closed-end lease<sup>1</sup> without a listing in *ALG*. Leasing companies have leased bi-fuel and dedicated natural gas and propane vehicles to customers on open-end leases<sup>2</sup>. In current practice, if a vehicle is not listed in the current or residual pricing guides, the ability to obtain satisfactory price performance in the secondary market is limited.

### **Flexible Fuel Vehicles Operating on Gasoline and Ethanol**

FFVs capable of running on a mixture of gasoline and ethanol are in the market in large numbers. The automobile manufacturers have assembled more than 2 million of these light duty vehicles. These vehicles are leased in large numbers and are priced in *ALG* but are not identified as FFVs. The view from the pricing guides and major auction houses are that these vehicles are treated almost the same as their gasoline counterparts in the wholesale market.

Some dealers bid lower on vehicles identified with environmental logos. Others do not bid on these vehicles at all. One industry observer thinks these dealers had bad experiences with methanol FFVs in the early 1990s and that their long memories continue to suppress the market.

Pete Flynn of Manheim Auctions observed that FFVs offered for sale by GSA receive comparable prices to the gasoline model of the same vehicle (Flynn). He also noted that the GSA vehicles tend to have less mileage and in theory should garner higher prices but do not. Others in industry affirmed this view. The typical view is that ethanol FFVs are purchased at auction at a discount of \$100-\$200 compared to their gasoline counterparts.

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<sup>1</sup> In a closed-end lease the leasing company takes the vehicle back from the user at the end of the lease. The leasing company is then responsible for disposal of the vehicle.

<sup>2</sup> In an open-end lease the lessee retains ownership of the vehicle at the conclusion of the lease.

Clearly, the resale value of ethanol FFVs is not a deterrent to vehicle purchase or operation. The incremental cost of these vehicles at purchase and the incremental cost at sale add little to the life cycle cost of ownership.

### **Bi-Fuel and Dedicated Compressed Natural Gas Vehicles**

Wholesale auctions have rarely disposed of bi-fuel or dedicated gaseous AFVs. No pricing data have been gathered on these vehicles and there are no “rules of thumb” on how to value them in the absence of pricing data.

Most of these vehicles enter the secondary market through private sales that are not documented by the pricing guides. The vehicles available for resale have until recently been aftermarket conversions. Owners of such vehicles have largely kept them for the full useful lives of the vehicles. Where sale or disposal was conducted, the natural gas system was removed, primarily to eliminate liability. But also, fleets had the option, within the U.S. Environmental Protection Agency’s Memorandum 1A<sup>3</sup> guidance, to install some compressed natural gas equipment, such as tanks, into later model vehicles.

Exact figures are not publicly available, but GSA is probably the largest reseller of bi-fuel and dedicated compressed natural gas vehicles. These vehicles number in the hundreds; the total number of vehicles disposed by GSA each year is more than 20,000. GSA representatives have stated that bi-fuel vehicles are selling at approximately 80% of *Black Book* national average and dedicated vehicles are selling at 60% of *Black Book* national average compared to gasoline-only vehicles.

Manheim’s Pete Flynn has worked with GSA to market these AFVs. The marketing has included extensive efforts to reach out to state regulators, state fleet operators, state surplus buyers, and environmental groups. He has focused on the positive attributes of the GSA cars such as their contributions to clean air, their low mileage, and their good condition.

In contrast to the GSA experience, EV Rental has claimed that its resale program for dedicated compressed natural gas vehicles is meeting its financial objectives (O’Day). EV Rental advertises its used cars on its Internet site. Unlike GSA, EV Rental keeps its cars in service and earning revenue until they are sold. By advertising on its Web site, EV Rental keeps advertising costs low. Since environmental customers already visit the site, there is little incentive to advertise further.

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<sup>3</sup>The U.S. Environmental Protection Agency’s Memorandum 1A provides guidance on converting gasoline vehicles to use natural gas or propane without running afoul of Clean Air Act emissions control system tampering regulations.

### **Bi-Fuel Vehicles Operating on Gasoline and Propane**

Little information is available in the wholesale market for light duty bi-fuel vehicles operating on gasoline and propane. Many agricultural vehicles use gasoline and propane, or even propane, exclusively. However, these are not described as light duty vehicles and are not changing hands through the automotive markets. Both Ford Motor Company and General Motors have introduced bi-fuel propane light and medium duty vehicles. However, these vehicles have only recently entered the market and will not appear in the aftermarket for a few more years.

## **Focus Group Meetings**

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### ***A. Introduction***

A primary objective of the U.S. Department of Energy (DOE) grant to Dorfman & O'Neal was to quantitatively document the AFV resale market. However, it quickly became apparent that information on such transactions is not readily available. As a result, the scope of the project changed.

To help bridge the deficiency of information on AFV resales, four regional focus group meetings were organized and conducted between April and June 2001. Individuals and organizations most affected by or interested in the AFV resale market were invited to participate in the hope that anecdotal information could be gathered to assess the current state of the market and to provide recommendations on its future facilitation. What follows in this section of the report is a compilation of information, observations, opinions, and recommendations that were gathered during these meetings. To create an environment for a candid exchange of information, participants were assured that their individual remarks would not be attributable. Therefore, their remarks are reported in aggregate and organized into general themes that arose at each of the four sessions.

### ***B. Alternative Fuel Vehicle Resale Comments and Observations***

It is misleading to draw too many conclusions from information available about the population of more than 2 million OEM AFVs currently on the road in the United States. Most are FFVs that are operated almost exclusively on gasoline, are sold interchangeably with gasoline vehicles in the used car market, and command generally comparable prices. On the other hand, the current inventory of natural gas and propane vehicles available to the resale market comprises largely outdated aftermarket conversions that often have outlived their useful lives and have little resale value. It would therefore be inappropriate to compare and contrast the resale experiences of these conversions with the OEM FFVs, or to draw any conclusions about their relative residual values.

Most of the current OEM dedicated natural gas, bi-fuel natural gas, and propane vehicles were not introduced until the mid to late 1990s. Production levels are low. As a result, relatively few high-quality, low-mileage natural gas and propane OEM vehicles have made their way to the resale market. The commercial AFV market has therefore failed to reach a "critical mass" worthy of the automobile auction industry's attention.

Another requirement for establishing a viable AFV resale market is to track vehicle mileage, condition, and resale prices. Unfortunately, this information is not centrally cataloged. None of the auction associations or reporting guides track AFV resale data, and GSA considers this information to be proprietary.

There is anecdotal evidence of middlemen who have identified markets in which they purchase AFVs at low cost and sell them at significant profit. California is one such market. The drivers of this dedicated AFV resale market in southern California include high occupancy vehicle (HOV) lane access, free parking in downtown Los Angeles, and significant rebates from the South Coast Air Quality Management District that also apply to used dedicated vehicles. Bi-fuel vehicles are not eligible for the same benefits (LA Focus Group).

The auction system rarely provides more than one week for buyers to view vehicles, and until recently the availability of AFVs at GSA's public auctions was not published in advance. In some cases, buyers have been surprised to learn that their recently purchased cars can also operate on natural gas.

Our focus group participants could not identify any wholesale auctions where dedicated or bi-fuel AFVs were accepted for dealer auctions. However, some auction houses under contract to GSA have auctioned dedicated and bi-fueled AFVs. A repeated comment was that GSA lost potential revenue by failing to adequately advertise the availability of used AFVs at its auctions. Focus group participants also recommended that the availability of these vehicles be advertised three to four months in advance.

FFVs suffer little depreciation in value and sell for prices comparable to gasoline vehicles. The fact that the FFV can run on E85 is rarely disclosed to the wholesale or retail purchaser (Denver Focus Group).

Most potential customers for used AFVs are not wholesalers, and need time in advance of the auction to examine a vehicle and line up financing. This requirement does not work well within the traditional resale model employed by the automobile auction industry. A major challenge to AFV resales is therefore to find a way to accommodate the needs of the AFV retail customers within the framework of the traditional way of selling used vehicles at auction.

### ***C. Federal Government Experience***

GSA has been the largest purchaser of AFVs since the Energy Policy Act of 1992 (EPAct) was enacted. Consequently, the disposition of these vehicles is of great concern to GSA. Typically, GSA holds sedans for 3 years or 36,000 miles, whichever comes first (Philadelphia Focus Group). Light duty trucks and vans are held for 6 years or 60,000 miles. This past year, however, GSA decided to extend the utilization cycle of these vehicles by 12 months. The reasons provided for this policy change include the modest use of these vehicles (low mileage) and an ongoing internal GSA review establishing more profitable ways to dispose of them.

In certain areas, AFVs are resold for a higher value than in others, depending on the benefits available and local market conditions. One GSA employee stated that in his region, the government can lose 5% of the value for an FFV, 10%-15% on a bi-fuel vehicle, and 20%-40% on a dedicated AFV. He felt the biggest impediments to higher resale values were the lack of infrastructure and lack of knowledge regarding fueling site locations.

GSA is required to remarket its vehicles through public auctions, so in addition to state agencies, local municipalities, and wholesalers, the public may have the opportunity to purchase these vehicles. The federal government's inadequate public education and outreach programs for AFVs hinder GSA's efforts to market the vehicles.

GSA's decision to delay its AFV resale for FY 2002 means that \$20 million worth of AFVs will be in the GSA fleet for at least 4 years, and a correspondingly small number of new AFVs will be purchased (Philadelphia Focus Group). Because GSA receives no Congressional appropriations for its fleet leasing program, funds received from the resale of used vehicles are critical to its financial stability and its ability to purchase new vehicles. GSA was sufficiently concerned about poor resale values that it created a new Remarketing Division to coordinate the national remarketing program for conventional vehicles and AFVs. A Web site is now available to give consumers a "one-stop shopping experience" and will list auction locations and times. Previously, such marketing was handled regionally, with little uniformity among the regions (Philadelphia Focus Group).

There have been isolated instances of AFVs achieving good resale values. A California GSA fleet manager acknowledged that when vehicles are specifically marketed to organizations where infrastructure is readily available, a dedicated AFV can sell for its anticipated value. In his opinion, the market otherwise is too immature to deal with the auction process.

#### ***D. Private Sector Experience***

Unfortunately, because of the comparatively low volumes of AFVs produced by manufacturers and the small numbers requested by lessees, the major leasing companies cannot provide significant information on leasing programs or resale values. When a customer decides to lease an AFV, the process is difficult because reliable residual values are not available in *ALG* (LA Focus Group). The idea of leasing AFVs is new enough that few, if any, have appeared on the secondary market.

OEMs such as Honda and Ford have only recently established programs to lease vehicles to customers. Currently, Honda sells its dedicated CNG Honda Civic GX to EV Rental, a car rental agency affiliated with Budget Rent A Car. American Honda Finance Company worked with the publishers of *ALG* to create an internal residual value for its own use that is acceptable to all parties. This value is not published by *ALG* (Cerruti). Honda also leases the GX to individuals through its dealerships and Honda Finance, but the vehicles are assigned lower residual values and therefore produce leases less favorable than those of comparable gasoline models (LA Focus Group).

Ford, through its Th!nk division, is offering “Green Leases” through Ford Motor Credit (Philadelphia Focus Group). The program, announced in May 2001, pegs the residual value of the Th!nk City vehicle to the value of the electric Ford Ranger pickup truck. The Th!nk Neighbor vehicle is a completely new category, and no method for determining a residual value has yet been applied. The residual values are guaranteed by Th!nk, not by Ford Motor Credit (Philadelphia Focus Group).

The consensus is that establishing AFV residual values for 3 to 4 years in the future is difficult. Subsidies provided by the states and the federal government on new vehicles today may change unpredictably during the lease period because of programmatic or funding source changes. This unpredictability is not easily integrated into the models that predict future residual values. Leasing companies are reluctant to assume that these incentives will continue, and since the incentives are critical to future valuations, they remain reluctant to add AFVs to their portfolios.

### ***E. Rental Car Companies***

The only rental car company currently offering AFVs nationally is Budget/EV Rental, based in Los Angeles, California. Its first purchases of vehicles are now beginning to hit the resale market. A strong resale value on these cars is important to EV Rental, since its business model relies on a good resale price to purchase new replacement vehicles (LA Focus Group). The difficulty of leasing AFVs through conventional methods necessitated developing relationships with OEMs, most notably with Honda. EV Rental and Honda worked together to determine a residual value that would be acceptable for publication by *ALG*. EV Rental is using innovative marketing strategies to find buyers for its used AFVs. Current marketing efforts include Internet advertising (on third party Web sites as well as its own), offering Clean Cities coordinators a finder’s fee, using Honda’s AFV consultants, and notifying Honda’s authorized AFV dealerships. The company averages three inquiries a day, and as of June 2001 sold through these channels six Civic GXs and four Insights. Eight of these vehicles were sold in California, one in Pennsylvania, and one in Arizona (LA Focus Group).

Unlike GSA, EV Rental ensures a constant revenue stream by keeping the vehicles in the rental fleet until they are sold. The company arranges appointments with customers to view the vehicles and take them for test drives. Since most of the available vehicles are in California, potential customers in other states are at a disadvantage because they cannot easily inspect them. In all cases, the initial asking price is the *Kelley Blue Book* value for the Civic LX (comparable gasoline model). Negotiations continue from there (LA Focus Group).

### ***F. Individual Sales***

The private sales of AFVs to or between individuals are hardest to document because the AFV resale market is decentralized. There is no current methodology to track these transactions. The transactions are therefore not accessible to the publishers of resale guides and a valuable source of information goes unrecorded.



The private AFV sales phenomenon is largest in California for a number of reasons. The state has stringent emissions requirements that are almost always met by AFVs. In addition, substantial benefits are accorded those who purchase and drive new and used AFVs (LA Focus Group). These benefits are discussed more fully in the next section.

A representative from ENRG Fuel (formerly Pickens Fuel) detailed his involvement in a number of private sales during the LA Focus Group Meeting. He considers himself an intermediary, hooking up buyers and sellers, and allowing them to negotiate their own prices. Sales are completed through the services of a licensed automobile broker.

A critical concern regarding individual AFV sales is the lack of consumer education (Providence Focus Group). The average car buyer is aware neither of the availability of AFVs nor of the advantages and incentives for driving them. Consumers who are environmentally oriented form another potential customer base, but little has been done to attract this group (Philadelphia Focus Group). Even when an organized effort is made to market to environmental activists, sellers find that environmental concerns do not override the need for fueling infrastructure convenience (Providence Focus Group).

### ***G. Subsidies***

AFV subsidies are available to consumers in a number of forms. Most are monetary subsidies, but a growing number are provided as benefits to owners and drivers. The federal government offers several kinds of subsidies, including an income tax deduction and rebates distributed through a DOE program. Arizona had a very generous AFV rebate program. Despite the controversies that arose over its eligibility loopholes, the program successfully demonstrated how a large demand for AFVs can be created through rebate incentives that reduce AFV purchase costs. Rebate incentives should be extended as well to used AFVs to stimulate the resale market.

California offers those who drive dedicated AFVs access to the state's HOV lanes, and a \$3,000 Mobile Source Air Pollution in the community rebate funded through license registration fees (LA Focus Group). Most individuals who purchase used AFVs in Los Angeles are motivated by the time savings of HOV access. A Los Angeles commuter will reduce commuting time by at least 15 minutes a day. Additional driving time reductions are possible because the HOV lane restrictions are in effect 24 hours per day. For lawyers and other professionals, the time savings provide more work time and more recreational time. The 24-hour access can also benefit tradesmen, courier services, and the average driver.

Virginia and Arizona also provide AFV single-occupant access to HOV lanes. Several Virginia AFV commuters reported that their commuting times have been reduced by more than one hour per day through HOV access.

Colorado offers a rebate to those who purchase new AFVs, but is still uncertain whether that rebate may be extended to used AFV purchases (Denver Focus Group).

The ineligibility of used AFVs for rebate money is a roadblock to a more dynamic used AFV marketplace. Most programs only offer rebates for new or untitled AFVs, leaving a prospective secondary buyer with no monetary incentive to purchase a used AFV.

## Conclusions and Recommendations

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### Conclusions

Ironically, to understand how a traditional auction works and what drives its success is to understand why AFVs cannot reasonably be remarketed within its framework, at least for now. The traditional method of operating automobile resale auctions is simply an impractical way to resell AFVs in today's marketplace because:

- AFVs are not in reasonably constant supply. Supplies of OEM natural gas and propane AFVs are not plentiful enough to stock the insatiable appetite of typical automobile auctions. FFVs are the only AFVs in plentiful supply, but these are, for all practical purposes, gasoline vehicles in disguise.
- The few natural gas and propane vehicles that are available for resale are typically high mileage, late model conversions with little remaining useful life and little residual value. Only recently did OEM natural gas and propane vehicles (both bi-fuel and dedicated) begin appearing on the resale market. Since production volumes were small to begin with, the available resale quantities of such vehicles remain inconsequential, especially to traditional automobile resellers who are accustomed to working in large volumes with constantly replenished supplies. In contrast, the largest number of natural gas vehicles comes from GSA, where "large" quantity is defined as a few hundred units.
- The market demand for AFVs is not uniform. There are significant differences in demand by region. Demand is strongest where adequate infrastructure has been developed or where the incentives for purchase are strongest. The incentives that generate the most positive response in the AFV resale market are rebate incentives for used AFVs and single-driver access to HOV lanes. These demand patterns contrast with Hoffer's characterization of the traditional automobile resale market, "the near perfect market, validated by the lack of statistical price differences in value of specific model cars between various regions."
- Wholesalers, the predominant buyers of used automobiles, generally have little knowledge of AFVs and even less understanding of potential buyers.
- Those most interested in buying AFVs have no access to traditional auctions. Furthermore, potential buyers have rarely engaged in other business transactions with the wholesalers who buy from the auction sites.

This does not mean that automobile resellers will always dismiss the AFV resale market, only that given the current market conditions, they are inclined to stay on the sidelines. Resellers will become active players when they independently determine that AFVs represent viable business opportunities.

If the automobile resale hierarchy is unmotivated by the present AFV resale market opportunities, a bridge strategy must be developed to address the current AFV resale market needs. The strategy, however, should not disenfranchise the traditional players. Rather, the door must be left open for their future participation and provide ongoing encouragement about opportunities that will continue to be open to them.

Our research has identified key program elements to the successful remarketing of AFVs:

1. **Location** – Some consumers are interested in buying used AFVs. The challenge is finding them. They are not located everywhere, but rather in markets with adequate infrastructure, or where financial or other incentives are available.
2. **Time** – Potential buyers are typically end users who do not carry large lines of credit and are uncomfortable with impulse purchases. They need ample notification of the pending availability of vehicles, time to inspect the vehicles or research their use, and time to line up financing.
3. **Convenience** – Easy access to the auction site, acceptable methods of payment (credit cards), and provisions for the efficient transport of vehicles to their new owners are all important considerations.
4. **Reputation** – Consumers must have confidence in the business transactions, be convinced that the parties are reputable, and understand that reasonable recourses are available to resolve disputes.

A bridge strategy must include a user-friendly Web site from which AFV resale transactions can originate. The chosen Web site must be readily accessible to all potentially interested stakeholder groups, unlike the restricted sites for automotive wholesalers or the interest group sites that attract more limited audiences. Ideally, the auction Web site will have extensive automobile auction experience, can accommodate simple online registrations, can facilitate payments through either credit card or certified check, and can provide consumer protection against fraud or improper practices.

eBay stands out as an excellent candidate because of its experience and success in handling online automobile auctions, its accessibility and reputation, and its ability to customize site operations. For example, specialized sites can be constructed within eBay to accommodate specific types or models of vehicles. Auctions can be categorized based on regional considerations or auction duration. Customers can post a bid or decide to purchase a vehicle at the asking price. The auction can be set up to last for a week or longer, providing customers with ample opportunity to research their purchases and arrange financing, if necessary. List servers can be developed to alert potential customers of vehicle availability and provide real-time updates on bid prices during the auction.

A Web site also has the capability of cataloging information about the resale vehicles, including such considerations as vehicle identification number, mileage, condition, and sales price. Gathering these data is critical to the long-term success of new and resale AFV markets.

Using an established Web site for AFV resale auctions has its advantages. Limited resources are required to create and expand the network of potential AFV buyers and sellers. Establishing a new Web site is much more labor intensive and has no assurance that it will become a well-trafficked destination.

A central depository of information must be established. Current Web sites offered by AFV proponents do not have the capabilities to gather the required information, or the objectivity to have data authenticated for automotive industry use. The AFV market will never achieve its potential until realistic residual values, which will not be established until AFV sales data are available to industry-recognized publications, are established for AFVs. Facilitating AFV resale information into industry-accepted publications is essential to the future health and growth of the AFV industry.

Establishing links to AFV advocacy sites from a primary Web site is both appropriate and beneficial. Efficient communication of AFV resale opportunities is an essential component of a robust program.

Developing, frequently refining, and updating a network of buyers and sellers is also critical to the success of any AFV resale effort. Those in the best position to develop this list are the stakeholders of DOE's Clean Cities Program.

Clean Cities stakeholders include government officials, fuel providers, fleet operators, OEMs, environmentalists, and authorized AFV dealers. They have a personal interest in purchasing used AFVs or know others who do. Since these stakeholders represent the focal point of the current marketplace for used AFVs, ample communication with them about resale opportunities is imperative. It is also appropriate to reach out to EPA-regulated fleets because they are required to purchase AFVs and want to do so as economically as possible.

A communications plan that identifies all key interested parties is one major element of a successful AFV resale program; a database of AFV populations is also essential. It is less important to know how many OEM AFVs have been assembled than to identify who is operating them, where they are, and when they are likely to enter the resale market. This information is often more readily available from local dealers than from the automobile manufacturers.

The Clean Cities Program must be enlisted to help create a national server list of all interested parties to AFV resale interactions. A logical place to start a contact list is with the stakeholder groups since they include many potential buyers and sellers. Many of these lists have already been collected in some form by individual Clean Cities organizations. AFV dealers are in the best position to help identify what has been sold to whom. Selling dealers are in the best position to identify major fleets in which vehicles are coming off lease, or to determine the frequency of their replacement cycles. Also, these dealers may be interested in purchasing high-quality used AFVs. Clean Cities organizations are in the best position to garner this information from their stakeholder dealers because of their established relationships.

A key beneficiary of all this information and the communication it generates is GSA's remarketing program, which holds a significant portion of the available AFV resale inventory. Although federal regulations may dictate how GSA resale auctions are conducted, within guidelines, every effort must be made to coordinate these opportunities with the key Clean Cities stakeholders. GSA initially reported weak sales for bi-fuel and dedicated natural gas vehicles, producing selling prices 20%–40% less than comparably equipped gasoline models, but other evidence suggests that GSA can command strong resale values if the vehicles are marketed to the appropriate end users. Early notification to Clean Cities stakeholders and EPA-regulated fleets of pending GSA AFV sales can ensure a much more robust resale.

### **Recommendations**

The study has produced six specific recommendations as next steps in efforts to energize the AFV resale market:

1. Establish a Clean Cities task force to coordinate the development of a comprehensive national list server of potential buyers and sellers of used AFVs. The starting point is an aggregation of all Clean Cities stakeholder lists and lists of EPA-regulated fleet contacts. Other interested parties, most notably AFV new car dealers and their customers, must be added. OEMs, AFV dealers, government officials, fuel providers, and trade association representatives should be invited to participate.
2. Foster a closer working relationship between the GSA Remarketing Division and the Clean Cities Program stakeholders and EPA-regulated fleets. GSA may not participate directly in an AFV resale Web site, but the Clean Cities organization can definitely ensure greater participation in GSA AFV resale auctions. To facilitate a more efficient coordination between GSA and Clean Cities, we propose to organize a special meeting of GSA remarketing officials and Clean Cities stakeholders to determine how best to accomplish these objectives.
3. Establish a task force to construct an AFV page at the eBay or a comparable Web site. IT professionals, leasing companies, major fleets, rental car companies, wholesalers, dealers, OEMs, and trade association officials should be invited to participate with the Web site officials in developing the site's operating parameters.
4. Establish a task force to develop data collection methodology for recording AFV resale transactions. To ensure that all relevant data are collected and shared with key automotive industry experts and publications, representatives from the automobile industry's vehicle pricing services, leasing companies, IT professionals, and Web site representatives should be invited to participate.

5. Develop strategies to review all current and proposed AFV rebate programs in an effort to extend program eligibility to purchasers of used AFVs.
6. Develop strategies to promote the wider introduction of HOV-1 and green curb programs that provide additional nonmonetary incentives for the use of new and used AFVs. To the extent possible, expansion of any HOV program should be restricted to dedicated AFVs.

## Appendix – Sample Auction Run List

### *ABC Western Michigan Pre-Sale Catalog*

Current Catalog for Auction on 11-30-2001

<u>Run</u>	<u>Year</u>	<u>Make</u>	<u>Model</u>	<u>Ext. Color</u>	<u>Int. Color</u>	<u>Int. Type</u>	<u>Mileage</u>	<u>VIN</u>
<a href="#">700</a>	1998	TRUCK - CHEV	SUBURBAN	BURG	TAN	L	73,247	1GNFK16R4WJ358518
<a href="#">701</a>	1997	PLYMOUTH	BREEZE	PURPL	GRAY	C	84,307	1P3EJ46C7VN565528
<a href="#">702</a>	1999	TRUCK-FORD	EXPEDITION	SILVE	GRAY	C	38,880	1FMRU1763XLA09565
<a href="#">703</a>	1995	MERCEDES	S CLASS	BLACK	GRAY	L	91,748	WDBGA51E7SA262340
<a href="#">704</a>	1998	TRUCK-JEEP	CHEROKEE	PURPL	GRAY	C	58,849	1J4FJ68S2WL143341
<a href="#">705</a>	1998	TRUCK-FORD	WINDSTAR	GRAY	GRAY	C	29,250	2FMZA51U4WBE43144
<a href="#">706</a>	1999	TRUCK-FORD	EXPEDITION	GOLD	TAN	L	40,495	1FMPU18L6XLA26579
<a href="#">707</a>	1999	CHEVROLET	CORVETTE	RED	BLACK	L	39,660	1G1YY12G8X5100123
<a href="#">708</a>	1999	LINCOLN	NAVIGATOR	BLACK	GRAY	L	44,144	5LMPU28LXXLJ06616
<a href="#">709</a>	1997	BMW	Z3	RED	BLACK	L	47,410	4USCJ3329VLC06221
<a href="#">710</a>	1998	TRUCK-FORD	EXPLORER	BEIGE	TAN	C	42,142	1FMZU34X3WZA57572
<a href="#">711</a>	1999	TRUCK-FORD	F150	WHITE	GRAY	C	21,814	1FTRX17L4XNA48008
<a href="#">712</a>	1999	MERCEDES	E CLASS	SILVE	BLACK	L	39,782	WDBJF65H5XA749271

Source: Auction Broadcasting Company, LLC, Website, <http://presale.ashburn.auctionsolutions.com/abcwmi/>



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