

Final Report

**I-79 Fleet Manager Perspectives
On Natural Gas for Use as a
Transportation Fuel**

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Executive Summary

The objective of the Interstate 79 (I-79) Corridor Project is to increase the use of natural gas as an alternative transportation fuel in the region adjacent to I-79 between Charleston, West Virginia, and Pittsburgh, Pennsylvania. The project is a joint effort between Equitable Gas, Hope Gas, the West Virginia Development Office, West Virginia University, O'Green Compressor Company and the Department of Energy's National Energy Technology Laboratory (NETL). The project is funded by the Gas Research Institute and the Department of Energy's Clean Cities Program.

The project has three major components: new technology, infrastructure development, and market assessment. The new technology component is the introduction of the O'Green Compressor, with performance results analyzed by West Virginia University. Equitable Gas will do infrastructure development by adding two new refueling sites. The market assessment will be conducted by the NETL and is the subject of this report.

In order to provide natural gas stakeholders with useful market information that will serve to increase the use of natural gas within the I-79 corridor, the focus of the market component is to gather demographic data, fleet specific data, and a new type of data for the I-79 natural gas stakeholders, psychographic data. The collection and analysis of this information will provide new insight into fleet manager perspectives on the use of natural gas as an alternative transportation fuel. This new knowledge can be used by natural gas suppliers, after-market conversion companies, and original equipment manufacturers (OEMs) to develop an effective marketing strategy to increase the use of natural gas within the I-79 corridor.

Fleet managers from Western Pennsylvania and West Virginia were the targeted group for this market analysis. Data was collected by surveying fleet managers within the targeted region. A commercially available psychographic marketing tool, RISC Ameriscan, was used to gather information on fleet manager attitudes, interests and opinions. Fleet managers were asked to complete the survey associated with two, one-day fleet manager workshops held in May 1999, in Pennsylvania and West Virginia. A total of 147 responses were obtained.

The survey data yield some interesting information about the I-79 fleet managers related to demographic, fleet specific, and psychographic data. Generally, the I-79 fleet managers are overwhelmingly male (89% male, 11% female), and most are between the ages of 35 and 49. The fleet managers are quite educated with more than 60% having college degrees.

The fleet size for both Western Pennsylvania and West Virginia ranges from less than 20 to nearly 2500 vehicles, with a median size of 28. In Western Pennsylvania, there are a notable number of large fleets and almost equal numbers of small and mid-size fleets. By contrast, more than half the fleets in West Virginia contain 20 vehicles or less. As expected, traditional fuels (gasoline and diesel) are the overwhelming fuel choice for fleets along I-79. However, a significant fraction (about 45%) of the fleets state that they

have one or more bi-fueled and/or dedicated natural gas-fueled vehicles (NGVs). Fleet managers do not project the use of NGVs to measurably increase in the future. And all of those fleets that currently have no NGVs indicate that they do not plan on adding any NGVs.

Five distinct market segments can be established based on the demographic information. These market segments cover a broad range from those fleets with no NGVs and no plans to add any, to those that employ NGVs and plan to increase their use. These market segments are described below:

I-79 Fleet Manager Market Segments

Segment I	Fleets with no NGVs, and no plans to use NGVs in the future.	59%
Segment II	NGVs are currently used, but plans are to decrease use.	6%
Segment III	Bi-fueled vehicles in the fleet, but are not operating on natural gas much of the time.	see note
Segment IV	Fleets with NGVs that expect to maintain current usage. No plans to add more NGVs.	25%
Segment V	Fleets with one or more NGVs with plans to add additional NGVs. Role models for natural gas use as a transportation fuel.	10%

Note: Segment III is a cross-section of Segments II, IV, and V. The actual size of this market segment could not be calculated directly from the data obtained in the survey.

The psychographic data survey results reveal that the majority of I-79 fleet managers fall into the Ameriscan territories C3, C4, D2 and E. Some people in this group thrive on emotional intensity and exhilarating experiences. Others prefer the status quo. The glue that holds this group together is that they are all primarily motivated by pleasure and security.

NGVs have historically been marketed with messages that focus on social consciousness and financial gain. However, these items are not strong motivators for the majority of I-79 fleet managers. To best appeal to fleet managers in the C3, C4, D2, and E grouping, a marketing campaign should focus on pleasure and security.

Rather than emphasizing natural gas as a clean, domestic fuel, fleet managers need to be reassured that NGVs have a proven track record and that natural gas has a historical use as a safe and cost-effective fuel. This will appeal to their need for security.

Likewise, describing a possible financial gain in a way that presents an added inconvenience (additional expense for the vehicle, possibly inconvenient refueling, added mechanical knowledge) for a possible return over a period of time (lower fuel cost, longer engine life, and in some cases possible cost recovery in tax incentives) will not be effective. Instead, it is critical to describe the immediate gains from using NGVs (short-term payback, as an example). This will appeal to this group's need for instant gratification. And since this group responds well to statistics and facts, it would be most effective to describe this gain in quantitative terms such as calculations of payback period.

Considering this group's desire for pleasure, the use of NGVs must be presented in a way that does not imply added inconvenience. Refueling, maintenance, and performance must be shown to be comparable to traditional gasoline-fueled vehicles.

Survey results confirm that the fleet managers in the C3, C4, D2, and E grouping have the same concerns and issues as the entire population polled in the survey. Refueling convenience, operating and maintenance costs, safety, performance, and range all ranked as most important issues with respect to operating natural gas-fueled vehicles.

Rebate programs and/or subsidies for alternative-fueled vehicles are not expected to make a noticeable impact on market penetration since financial incentives ranked low. However, the effect of incentives on reducing the cost of owning and operating NGVs should not be overlooked, since fleet managers cite cost as a top factor in making the decision to employ NGVs. Likewise, fleets do not appear concerned about government mandates that require the addition of alternative-fueled vehicles to their fleets.

In addition to a marketing campaign, the survey results suggest other actions that industry stakeholders might undertake to improve natural gas use along the I-79 corridor. These include educational outreach (workshops, training, etc.), infrastructure development, reduced cost of natural gas vehicles, and increased availability of originally equipped NGVs.

Background: The I-79 Corridor Project

The objective of the I-79 Corridor Project is to increase the use of natural gas as an alternative transportation fuel in the region adjacent to I-79 between the Cities of Charleston, West Virginia, and Pittsburgh, Pennsylvania. The Project is funded by the Gas Research Institute and the Department of Energy's Clean Cities Program, and is a joint effort between Equitable Gas, Hope Gas, the West Virginia Development Office, West Virginia University, O'Green Compressor Company and the Department of Energy's National Energy Technology Laboratory (NETL). The I-79 Corridor Project is an example of how government and the private sector can partner to harness their expertise for the good of the region.

The I-79 Corridor Project consists of three major components:

1. new technology,
2. infrastructure development, and
3. market assessment

The new technology component includes the purchase, installation, operation, and evaluation of a novel compressor, the O'Green compressor. Its design has the potential to improve system reliability, while substantially lowering capital cost, operating cost, and maintenance cost for open-access and on-site refueling stations. The hydraulic compressor has been mainly used for scuba equipment air supplies, but has not been used in natural gas refueling station applications. West Virginia University will conduct technical research to compare the hydraulic compression system to conventional compressor types that use different drive systems.

The infrastructure development component will see the addition of two new natural gas refueling stations in the I-79 corridor. The proposed sites for the refueling stations have been carefully selected for their individual viability and to complete the existing chain of refueling stations. The end result will be an Interstate Clean Cities corridor approximately 220 miles long that will be a success story and a model for national alternative fuel vehicle strategic initiatives. The project plan is for Equitable Gas Company to install both refueling stations and supply fuel to one site, with Hope Gas providing fuel to the other.

The market assessment component collects fleet specific data and demographic information, and adds a clever dimension to the natural gas vehicle market knowledge in the form of a psychographic assessment of stakeholders. The psychographic assessment will yield quantitative research data of the human characteristics (attitudes, interests, opinion, and perceptions) of the fleet managers that may have bearing on their response to the use and acceptance of natural gas-fueled vehicles (NGVs). Understanding these characteristics in combination with fleet specific and demographic data will help to identify and explain the market, assist strategic marketing, and minimize risk. This analysis is expected to provide stakeholders (i.e. Clean City/State Organizations) with a framework for an effective marketing campaign that will lead to increased purchase and

operation of NGVs along the I-79 corridor. The Department of Energy's National Energy Technology Laboratory (NETL) is the lead for this market analysis task.

The increased use of natural gas along the I-79 corridor requires a combination of several factors: vehicle life cycle cost reductions, infrastructure expansion, increased vehicle marketability and availability, and emission reductions. This project takes advantage of the synergy of the three components described above (technology, infrastructure, and market) to permit these enhancements to occur simultaneously.

Objective: Developing New Market Knowledge

The objective of this market assessment is to collect and analyze market data in three categories: *demographic*, *fleet specific*, and *psychographic*. *Demographic data* capture personal attributes of the fleet managers, such as age and educational background. *Fleet specific data* characterize the structural and operational aspects of each fleet such as fleet size and location, vehicle types, range of travel, fuel use, etc. *Psychographic data* are a quantitative measure of the attitudes, interests, opinions, and perceptions of the fleet managers that may have bearing on their acceptance and use of natural gas. (See Appendix A for a brief overview of psychographics.)

It is the psychographic component of this market analysis that makes this assessment unique. This new market knowledge, combined with conventional fleet market data, may assist in identifying the strategic issues and barriers to the use of natural gas as a transportation fuel. Having this information is critical to developing a successful marketing campaign. Therefore, a concerted effort was undertaken to obtain all three types of market data from fleets operating along the I-79 corridor, and the combined results have been analyzed. By understanding what is driving the decisions of the fleet managers, a targeted marketing strategy can be formulated that will most effectively appeal to select market segments.

Approach: Market Assessment Task

This task was comprised of three major phases:

1. development of survey materials
2. selection of respondents and execution of surveys, and
3. analysis and reporting.

Development of Survey Materials

The survey developed for this effort is divided into two parts. Part one contains both demographic (age, gender, education, etc.) and fleet specific questions concerning fleet size, operation, infrastructure, refueling, safety and other issues related to the use of NGVs (see Appendix B). Most of these questions are closed-ended “multiple-choice” questions. In some cases, open-ended “essay” questions are utilized when a wide variety of responses is expected or when a greater depth of response is desired.

Part two of the survey contains the psychographic set of questions from the commercial RISC Ameriscan marketing tool. This set of thirty attitude and opinion statements requires the respondent to express how strongly he or she agrees or disagrees with each statement. The RISC Ameriscan tool assesses the responses and determines in which territory on the Ameriscan map the respondent belongs. A local marketing firm, Marshall Marketing and Communications, Inc., performed the RISC Ameriscan analysis, and the results were provided to NETL for incorporation in the overall market analysis.

Selection of Respondents and Execution of Survey

Fleet managers from Western Pennsylvania and West Virginia, especially those that travel along the I-79 in the corridor between Pittsburgh, Pennsylvania and Charleston, West Virginia, are the targeted group for the market analysis.

Fleet managers were chosen as the target market group since it served as an economical approach in addressing and satisfying customer needs in the I-79 corridor NGV market. Developing products and technologies, and addressing concerns such as life-cycle costs for vehicles, maintenance, and fueling infrastructure is best accomplished by satisfying customer needs and requirements; and surveying fleet owners is a logical step in understanding the needs and requirements of the customer.

Utilizing mailing lists compiled by stakeholders in the Pittsburgh Clean City and West Virginia Clean State associations, workshop invitations that included surveys were mailed to organizations consisting of private industry, government agencies, utility companies, fuel providers and educational institutions from all over the state of West Virginia and from Western Pennsylvania.

Since the typical response rate for mailed surveys is usually quite low, this effort utilized a unique approach to increase the probability that fleet managers would respond. Fortunately, both Clean City/State Organizations had one-day fleet manager workshops planned. By including the survey as part of the workshop registration materials, most fleet managers who attended the workshop completed a survey in advance. Additionally,

at the workshop, several computer terminals were made available to allow those that had not completed a survey in advance, to quickly complete the survey electronically. With this approach, 147 responses were obtained with greater than 99% of these responses coming from the targeted audience of fleet managers or their representatives. Based on this response rate, the results have a margin of error of plus or minus 8 percent.

Analysis and Reporting

The paper copy responses (obtained in advance of the workshops) and the electronic responses (obtained via computer on the day of the workshops) from part one of the survey were combined and tabulated with the aid of survey analysis software. Open-ended question responses were also compiled for analysis by NETL. The RISC Ameriscan psychographic tool was employed to analyze the responses from part two of the survey. Based on their responses, the fleet managers were assigned to appropriate territories on the Ameriscan map. The psychographic results and the fleet manager responses from part one of the survey were cross-tabulated by Marshall Marketing and Communications, Inc. and provided to NETL.

NETL attempted to infer as much as possible from the cross-tabulation of responses without conjecturing. This analysis emphasizes relative trends, common issues, and strategic barriers that may hinder successful implementation of natural gas use, rather than being based strongly on statistics and probabilities. The results of this analysis not only furnish a snapshot of what fleets look like in Western Pennsylvania and West Virginia, but also provide guidance to stakeholders for developing marketing strategies that will most effectively increase the use of natural gas as a transportation fuel in the region.

Highlights of Survey Results

This highlight section provides an “at-a-glance” view of the data collected from fleet managers along the I-79 corridor. The first table, Table 1, compares the results by fleet size (small fleets: 1-20 vehicles, mid-size fleets: 21-100 vehicles, and large fleets: 100+ vehicles). Table 2 makes a similar comparison by location (Western Pennsylvania versus West Virginia). These tables represent only a portion of the survey results and do not include any analysis. For additional data, and an understanding of these trends, please read the following sections.

Table 1. Survey Summary by Fleet Size

	Small Fleets	Mid-Size Fleets	Large Fleets
Vehicle Class	> ½ light duty ~ ⅛ each: light, medium and heavy trucks	< ½ light duty ~ ¼ each light and medium trucks ~ ⅛ heavy truck	~ ½ light duty ~ ¼ light truck ~ ⅛ each: medium and heavy trucks
Average Mileage (per vehicle)	> 40,000 miles/year	20,000 miles/year	20,000 miles/year
Refueling Method	Public Stations	Company-owned stations	Company-owned and public stations
Alternative-fueled Vehicle Projections	Dedicated NGVs: little change	Dedicated NGVs: 11% plan to decrease	Dedicated NGVs: 17% plan to decrease
	Bi-fueled: 30% plan to increase	Bi-fueled: little change	Bi-fueled: 30% plan to increase
Vehicles by Fuel Source	10% dedicated NGV 26% Bi-fueled	15% dedicated NGV 5% Bi-fueled	4% dedicated NGV 11% Bi-fueled
Top Issues	Performance Refueling Convenience Financial Incentives Safety Repair Facilities	Refueling Convenience Safety O&M Costs Performance Range / Purchase Price	Purchase Price Refueling Convenience O&M Costs Range OEM Availability

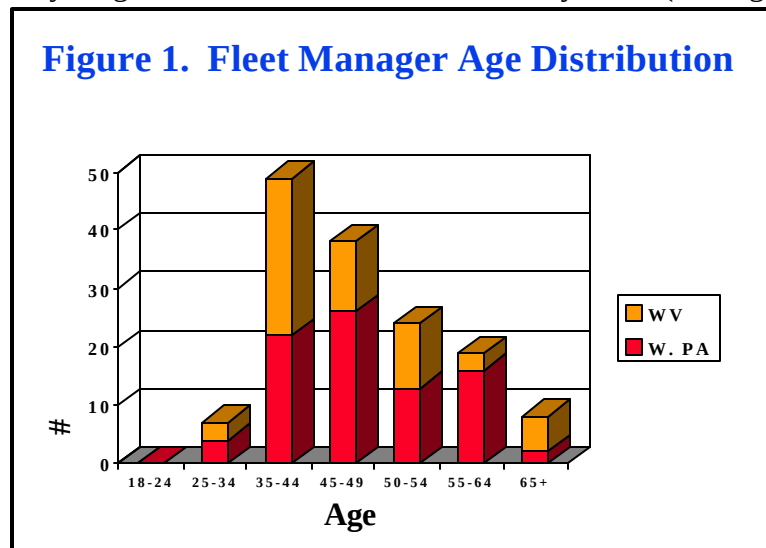
Table 2. Survey Summary by Location

	Western Pennsylvania	West Virginia
Median Fleet Size	52	16
Vehicle Class	~ ½ light duty ~ ¼ light truck ~ ⅓ medium and heavy trucks	~ ½ light duty ~ ⅓ light and medium trucks ~ ¼ heavy truck
Average Mileage (per vehicle)	~ 20,000 miles/year	~40,000 miles/year
Refueling Method	Equal split between public stations and company-owned (30-35% each)	~45% use public stations ~35% use company-owned
Vehicles by Fuel Source	10% dedicated NGV 9% Bi-fueled	5% dedicated NGV 20% Bi-fueled
Bi-fueled Vehicle Fuel Use	~8% of vehicles never use natural gas ~70% of vehicles use natural gas more than half the time	30% of vehicles never use natural gas ~45% of vehicles use natural gas more than half the time
Top 3 Traveled Counties	Allegheny Washington Butler	Monongalia Kanawha Marion
Top Issues	Refueling Convenience O&M Costs Performance	Refueling Convenience Safety Performance

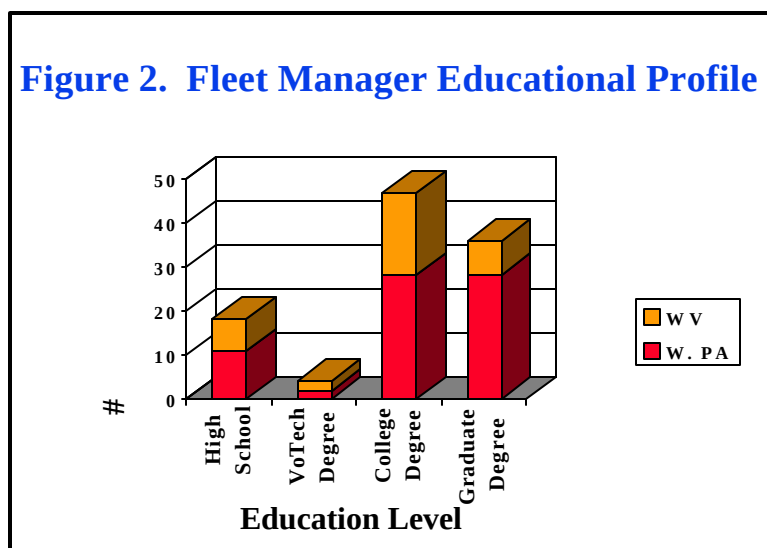
Demographic and Fleet Specific Data and Analysis

Who Responded to the Survey?

147 people responded to the survey (87 from Western Pennsylvania and 60 from West Virginia). Nearly all of the respondents (>99%) describe themselves as fleet managers or their representatives. The fleet managers are overwhelmingly male (89% male, 11% female), and most are between the ages of 35 and 49. Overall, fleet managers from West Virginia tend to be younger than those from Western Pennsylvania (see Figure 1).



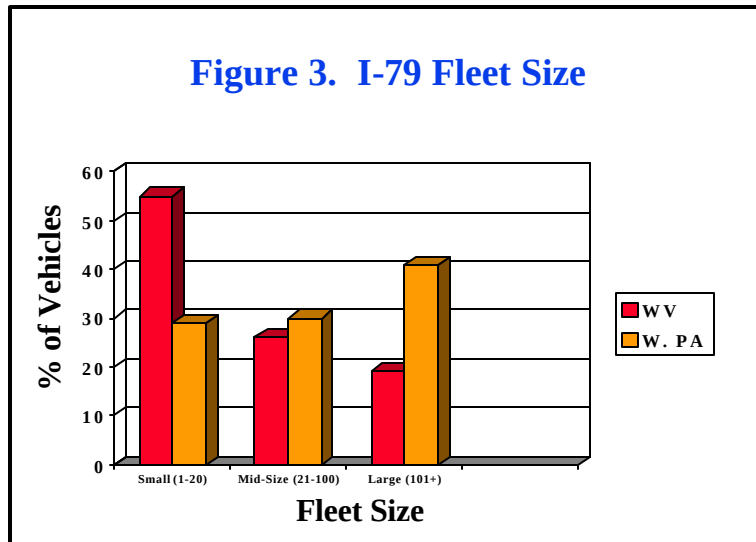
The fleet managers are quite educated with more than 60% having college degrees (Figure 2). More than 60% of Western Pennsylvania fleet managers have college and advanced degrees, whereas 45% of the West Virginia fleet managers have similar degrees.



What Do The Fleets Look Like?

Size

The fleet size for both Western Pennsylvania and West Virginia range from less than 20 to nearly 2500 vehicles, with a median size of 28. Figure 3 shows the distribution of fleet size in West Virginia and Western Pennsylvania. Small fleets are defined as less than 20 vehicles, mid-size fleets contain between 21 and 100 vehicles, and large fleets have more than 100 vehicles. In Western Pennsylvania, there are a notable number of large fleets and almost equal numbers of small and mid-size fleets. By contrast, more than half the fleets in West Virginia contain 20 vehicles or less.

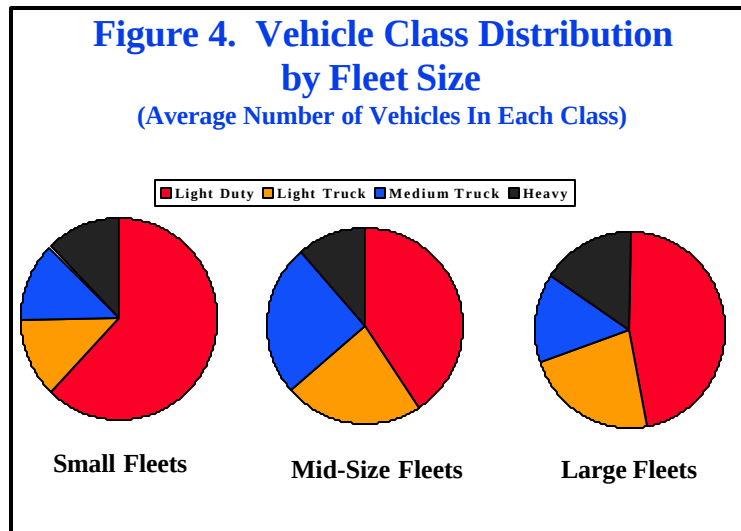


According to the results in Table 3, fleet managers do not expect fleet size to change significantly over the next two years.

Table 3. Median Fleet Size		
	CURRENT (1999)	PLANNED (2001)
Overall	28	32
W. PA	52	55
WV	16	16

Vehicle Class

As shown in Figure 4, regardless of fleet size, the largest number of vehicles is of the light duty class (cars, pick-up trucks, mini vans...<8500 lbs). Light duty vehicles typically transport drivers, passengers, tools, equipment, and light loads. They tend to travel more miles than the other vehicle classes. The sheer number of light duty vehicles in the fleets appears to be a potential market for NGVs.



There are several considerations, however, that may make NGVs a tough sell for this vehicle class. Because the driving range can be lengthy and the route unpredictable for this vehicle class, the availability of alternative fuel refueling stations is of prime concern. Additionally, most fleet managers want payback in a few years or less. But most fleets turn over their light duty vehicles before this payback period is realized, and without tax incentives or rebates, it is difficult to recoup the higher initial cost of an alternative fuel vehicle (NGV Institute, 1997). After-market conversion vehicles (gasoline or diesel fueled vehicles modified to operate on natural gas) may also be suited for this market; however, in most instances they cannot provide the same range as their gasoline or OEM (original equipment manufactured) counterparts (NAFTP, 1998).

Fleets of all sizes have a substantial number of light trucks or step vans (city delivery, large walk-ins...8500 – 19500 lbs.); medium trucks (Class 6, school bus...19501 – 26000 lbs.); and heavy trucks (tow truck, city transit, construction equipment...>26000 lbs.) Trucks and vans are good candidates for after-market conversion to natural gas since these vehicles are usually kept longer in the fleet, providing more time to recover the conversion cost (NGV Institute, 1997). Trucks and vans also typically have good cargo carrying capacity that provides the needed space for natural gas cylinders (NAFTP, 1998). Many of these vehicles have regular routes that accommodate refueling locations and schedules.

Mileage

Figure 5 shows the average number of miles traveled per vehicle in a year by location. The fleets in West Virginia travel more miles, possibly reflecting the state's more rural terrain and scattered market locations. Because of the higher mileage traveled by West Virginian fleets and the potentially longer routes traveled, refueling infrastructure could be an even more important issue in that state.

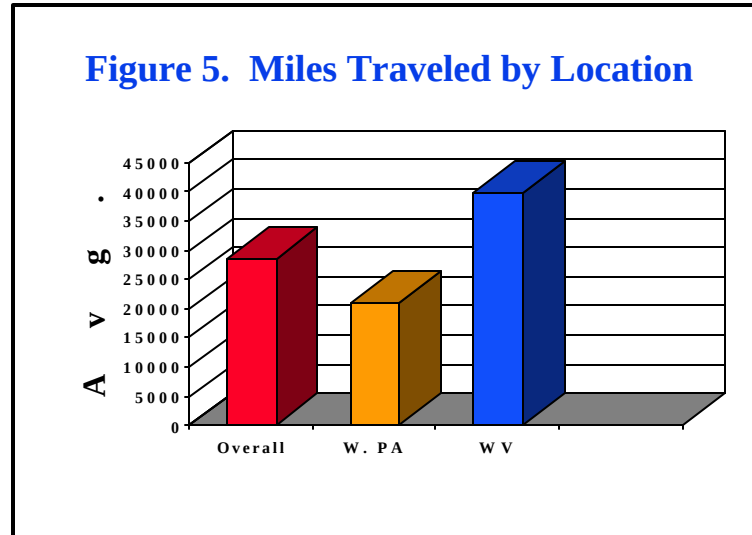
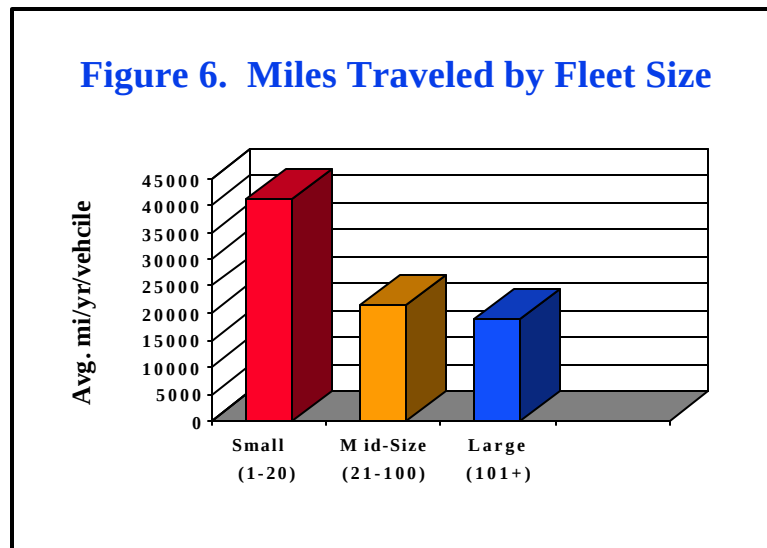
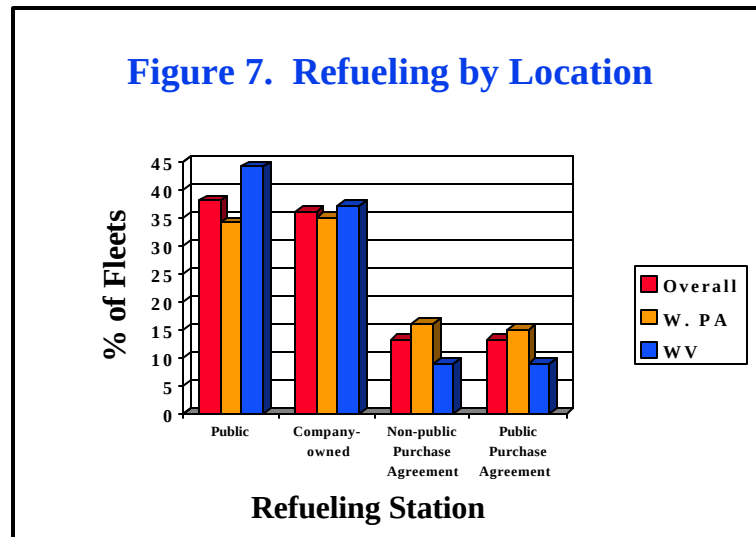


Figure 6 shows that smaller fleets tend to travel nearly twice as many miles each year as their mid-size and large fleet counterparts. This correlates well with the previous data shown in Figure 4. Smaller fleets tend to have a higher concentration of light duty vehicles, and these vehicles tend to be high mileage. High mileage is a good indicator of a potential NGV market. High mileage fleets consume more fuel, and the cost advantage of natural gas over gasoline will provide a reduction in operating costs, helping to offset the initial investment cost of the vehicle (Whalen and others, 1996).

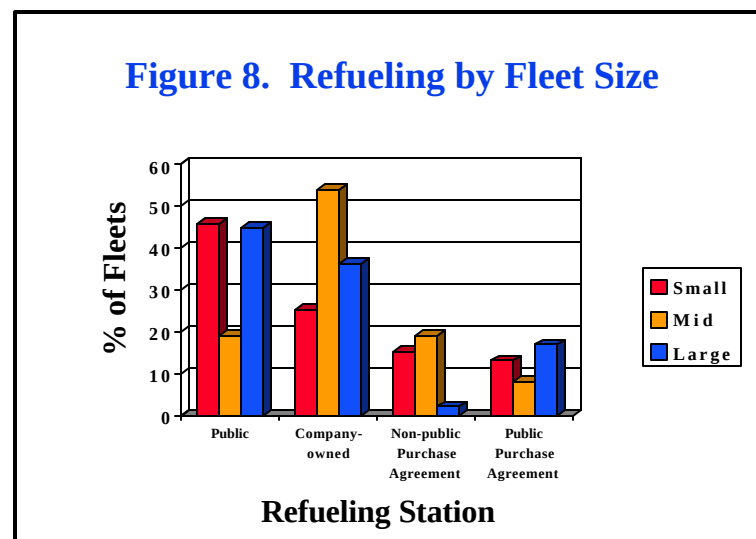


Refueling

Refueling is a significant factor in the decision to operate NGVs. Figure 7 shows that refueling methods for both conventional and alternative fuels are basically similar in both Western Pennsylvania and West Virginia. The majority of fleets depend on public stations and company-owned refueling facilities. A much smaller fraction of fleets rely on fuel purchase agreements.



There is a significant difference in refueling method when the fleets are analyzed on the basis of size (Figure 8). Small fleets tend to rely on public refueling stations without the benefit of a fuel purchase agreement. Mid-size fleets mainly use company-owned refueling facilities. Large fleets also rely on company-owned sites, but surprisingly nearly half of them also routinely use public refueling stations. Since most public refueling stations do not provide the capability to refuel a natural gas-fueled vehicle, this represents an infrastructure barrier that hinders the increased use of natural gas as a transportation fuel.



Fuel Use

Figure 9 shows the average percentage of vehicles in each fleet by fuel source. As expected, traditional fuels (gasoline and diesel) are the overwhelming fuel choice for these fleets. Fleets in Western Pennsylvania and West Virginia do have experience with alternative-fueled vehicles. A significant fraction (about 45%) of the fleets state that they have one or more bi-fueled and/or dedicated natural gas-fueled vehicles.

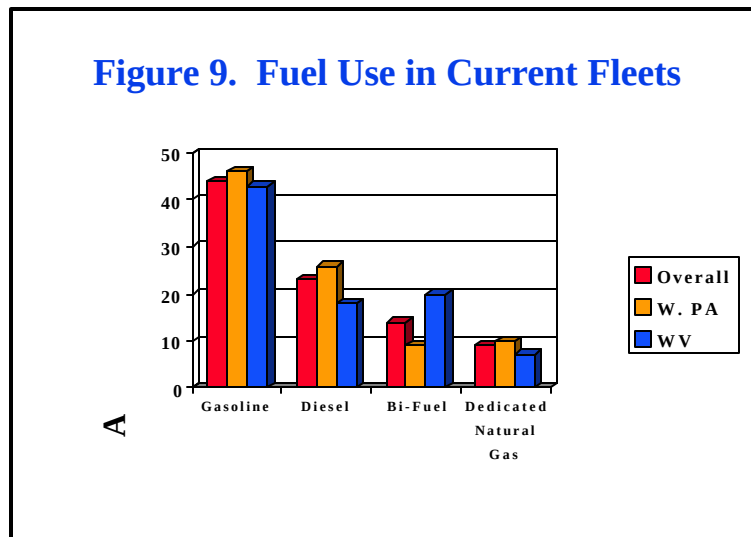


Table 4 shows smaller fleets are about twice as likely to use alternative-fueled vehicles (NGVs and bi-fueled vehicles) as the larger fleets. Small fleets seem to be the near-term market for natural gas. As mentioned previously, small fleets tend to have high mileage, and therefore, high fuel consumption. They also contain a significant number of vehicles in the vehicle classes that typically are good candidates for after-market conversion. And according to Table 4, small fleets appear to be more receptive to the use of alternative-fueled vehicles.

Table 4. Fuel Use by Fleet Size

	Small Fleets	Mid-Size Fleets	Large Fleets
Gasoline	46%	45%	59%
Diesel	18%	35%	26%
Bi-Fueled	26%	5%	11%
Dedicated NGV	10%	15%	4%

Previous market analyses have identified gasoline-fueled light-medium duty trucks to have the greatest probability of using natural gas (Plaxton, 1997). While almost any vehicle can be converted to use natural gas, not all vehicles make good candidates for after-market conversion. Gasoline-fueled vehicles generally make better conversion candidates than diesel-fueled vehicles. After-market conversion of diesel-fueled vehicles is not a viable option due to the prohibitive cost (\$15K - \$20K) and unacceptable tail-pipe particulate emissions (McGlinchey, 2000). Table 4 and Figure 4 show that all three fleet sizes could be target markets for after-market conversion to natural gas since all fleet sizes have a large fraction of gasoline-fueled vehicles as well as having a considerable number of vehicles in the light-medium truck class.

Fleet managers do not project the use of alternative-fueled vehicles to measurably increase in the future (Tables 5 and 6). Overall, nearly 90% of fleet managers expect dedicated natural gas vehicle use to stay the same. And three-quarters of the fleet managers predict bi-fuel use to stay the same.

Table 5. Planned Dedicated NGV Purchases by 2001

	Small Fleets	Mid-Size Fleets	Large Fleets
Stay the same	90%	90%	76%
Decrease	2%	11%	17%
Increase	8%	0%	7%

Table 6. Planned Bi-Fuel Vehicle Purchases by 2001

	Small Fleets	Mid-Size Fleets	Large Fleets
Stay the same	69%	87%	64%
Decrease	2%	5%	5%
Increase	29%	8%	29%

Interestingly, all of those fleets that currently have no NGVs indicate that they do not plan on adding any NGVs. Perhaps their unfamiliarity with the use of NGVs is keeping them from considering their purchase. For these fleets, a concerted marketing and education effort may sway them to consider the use of natural gas. The decision to convert to alternative fuels is economically driven. However, in addition to considering economy and fuel price, convenience factors such as refueling frequency and distance to refueling stations also play an important role (Plaxton, 1997). Not surprisingly, survey respondents reported lack of refueling convenience as well as prohibitive cost as reasons why no new NGVs or bi-fueled vehicle purchases are planned. Without incentives and/or government mandates, the switch from traditionally fueled vehicles to alternative-fueled vehicles will not occur while these issues remain a concern.

While the large fleets plan to decrease the number of NGVs in their fleet, they are at the same time planning to increase the number of bi-fueled vehicles in service. This may be an indication of the perceived lower risk of owning and operating a bi-fueled vehicle compared to a dedicated natural gas vehicle. And it may indicate that the large fleets plan to meet the Energy Policy Act (EPACT) with the purchase of bi-fueled vehicles. EPACT mandates that fleets meeting certain characteristics (such as size and location in a non-attainment region, among a variety of other factors) must purchase specified levels of alternative-fueled vehicles over the next few years. Since EPACT has more impact on larger fleets, it is not surprising that more than 75% of the managers of the large fleets (100+ vehicles) claim to be aware of this policy. However, overall, about half of the fleet managers said that they are not aware of this act, indicating that more could be done to educate fleet operators about the requirements and impacts of this legislation.

Although a significant number of bi-fueled vehicles are in service, it is interesting to find that nearly 20% of them apparently never run on natural gas and are basically operated as gasoline-fueled vehicles. This practice is more prevalent in West Virginia where 30% of bi-fueled vehicles are never operated on natural gas (Figure 10). This same finding was determined in a survey of federal fleets in which 33% of those operating bi-fueled vehicles routinely used gasoline rather than natural gas to fuel the vehicle (NREL, 1997).

Perhaps this trend is a result of fleet managers meeting the requirements of EPACT by purchasing alternative-fueled vehicles, but then the vehicle operators opt to use the most convenient fuel source (i.e., gasoline). This practice has the potential to increase emissions along the corridor. Vehicles that were converted to operate on natural gas prior to 1997 are not required to meet the more stringent emission limits of today's after-market conversion and OEM bi-fueled vehicles. Therefore, operation of older after-market conversion bi-fueled vehicles on gasoline may result in increased emissions compared to using that same vehicle as it was originally designed, that is, optimized for gasoline (McGlinchey, 2000).

Figure 11 shows that, on average, 60% of bi-fuel vehicles operate on natural gas for more than half of their use. Ultimately, the I-79 Corridor Project participants would like to see that all of the bi-fueled vehicles are operated a substantially higher fraction of their operating time on natural gas.

Figure 10. Bi-Fuel Vehicles That Never Operate on Natural Gas

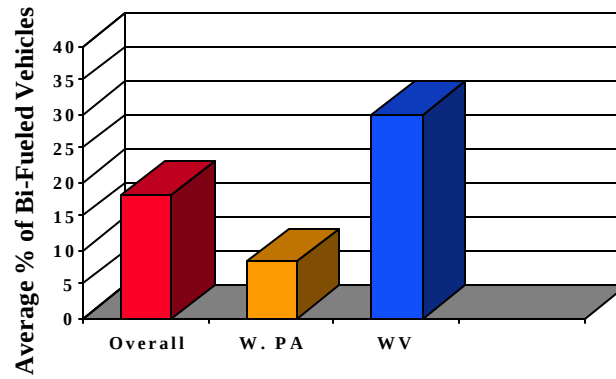
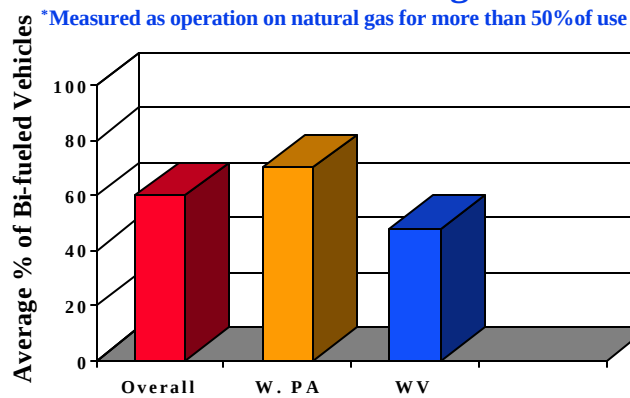


Figure 11. Bi-fueled Vehicle Natural Gas Usage*



Travel Along I-79 Corridor

The survey results confirm that many of the fleets questioned operate along the I-79 corridor. The top ten counties traveled by the fleets are listed in Table 7. More than 80% of fleet managers indicate operation along I-79. Eight of the top ten most heavily traveled counties are along the I-79 corridor (indicated in red italics). The top ten most traveled counties broken down by state are listed in Table 8.

Table 7. Top 10 Most Traveled Counties

County	% of Fleets Traveling in County
<i>Allegheny, PA</i>	46
<i>Washington, PA</i>	35
Butler, PA	28
<i>Monongalia, WV</i>	27
Beaver, PA	23
<i>Marion, WV</i>	22
<i>Lewis, WV</i>	21
<i>Greene, PA</i>	20
<i>Kanawha, WV</i>	20
<i>Braxton, WV</i>	18

counties along I-79 corridor

Table 8. Most Traveled Counties in PA and WV

PA County	% of Fleets	WV County	% of Fleets
Allegheny	74	Monongalia	47
Washington	45	Kanawha	42
Butler	41	Marion	40
Beaver	33	Lewis	38
Greene	26	Braxton	35
Lawrence	24	Harrison	28
Erie	23	Clay	27
Mercer	23	Gilmer	25
Crawford	21	Roane	25

What Factors Impact The Decision To Purchase Or Lease NGVs?

Fleet managers were asked to rank the importance of thirteen factors that could impact the decision to purchase or lease NGVs. The overall ranking is provided in Table 9. Refueling convenience, operating and maintenance costs, safety, performance, and range all ranked at 8 or more on a scale of 1 (least important) to 10 (most important). These same reasons were also common among managers and users of federal fleets (NREL, 1997), and should likely be the focus of any marketing effort.

Table 9. Ranking of Importance of Issues
On a Scale of 1-10

Refueling	8.7
O&M	8.4
Safety	8.3
Performance	8.2
Range	8.0
Price	7.9
Repair Facilities	7.9
Financial Incentives	7.7
Availability of OEMs	7.4
Energy Conservation	7.4
Government Mandates	6.8
Emissions	6.5
Public Relations Benefit	6.3



Increasing Importance

Survey results show that less than 3% of fleet managers believe NGVs are not as safe as gasoline-fueled vehicles. Yet, safety ranks high on the list. One possible reason is that fleets operating transit vehicles make passenger safety a prime consideration. Therefore, a high ranking of safety is not necessarily a reflection of concern over NGV safety specifically. On the other hand, 30% of the fleet managers surveyed cite that they do not know how the safety of an NGV compares to its gasoline-fueled counterpart. It appears that an educational campaign on the safety record of NGVs will only improve their image.

Government mandates, tail-pipe emissions, and public relations benefits all rank below a 7. Appealing to the environmental superiority of NGVs or the public relations benefit to making a fleet “green” will not likely be effective marketing strategies.

When the top items are analyzed by fleet size (see Table 10), the priorities are still refueling and safety. Refueling ranks highest for mid-size and large fleets. For the fleets with company-owned refueling sites, the problem must be concern about sufficient vehicle range. To remedy this problem, the OEMs must produce vehicles that have enough range with a margin of safety. Likewise, the natural gas suppliers must provide sufficiently distributed refueling stations to maintain “convenient refueling.”

Table 10. Top 5 Issues by Fleet Size

Rank	Small	Mid-Size	Large
1	Performance (8.4)	Refueling (8.9)	Price (9.0)
2	Refueling (8.3)	Safety (8.7)	Refueling (8.8)
3	Financial Incent.(8.1)	O&M (8.6)	O&M / Range (8.6)
4	Safety (8.1)	Performance (8.4)	OEM Avail. (8.2)
5	Repair Facilities (8.1)	Range / Price (8.1)	Safety (8.1)

Since operating and maintenance (O&M) costs were cited as top issues for mid-size and large fleets, OEMs must recognize that for these fleets to be interested in NGVs, their operational costs must be low. This is where statistics and success stories can become important marketing tools.

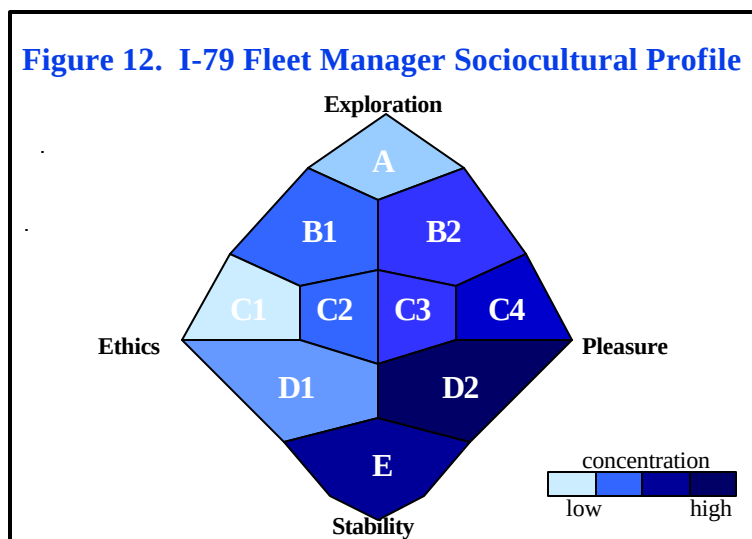
Other infrastructure issues, besides refueling, that rank high include repair facilities and OEM vehicle availability. These issues point to NGV dealers that must be willing to support the sales and repairs of OEM NGVs. However, NGV dealers are not likely to provide these sales and services without enough volume to make a profit. Therefore, OEMs will need to financially support dealers until the market develops. Also, federal and state governments can ease the situation by continuing to provide financial incentives that make the cost of purchasing NGVs competitive.

Interestingly, financial incentives do not make the “top five” list for mid-size and large fleets. Therefore, rebate programs or subsidies alone are not expected to be strong motivators to employ NGVs for the fleet managers polled in this survey. But incentives for alternative-fueled vehicles can have a noticeable impact on market penetration since they do have the effect of reducing the cost of purchasing and operating NGVs. This interrelationship between incentives and cost reduction is important since cost is cited as a top issue in purchasing NGVs. Fleets also do not appear concerned about government mandates requiring the addition of NGVs to their fleets. Note that this item does not make the list of top five considerations.

Psychographic Data and Analysis

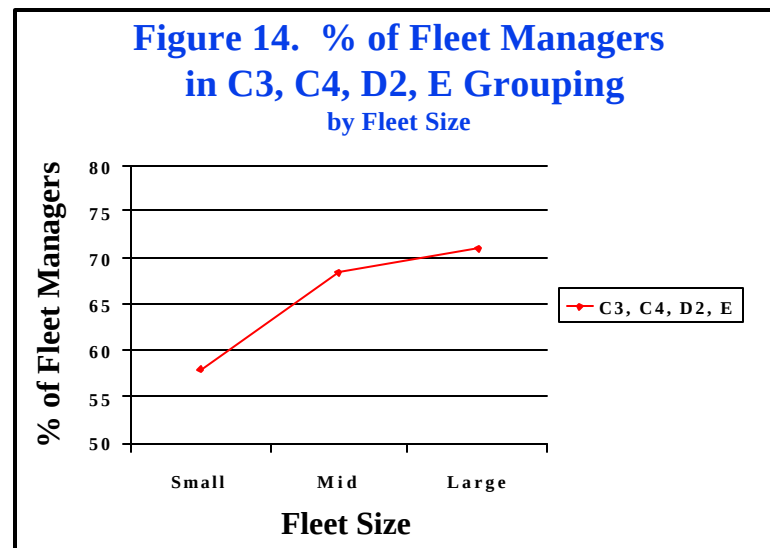
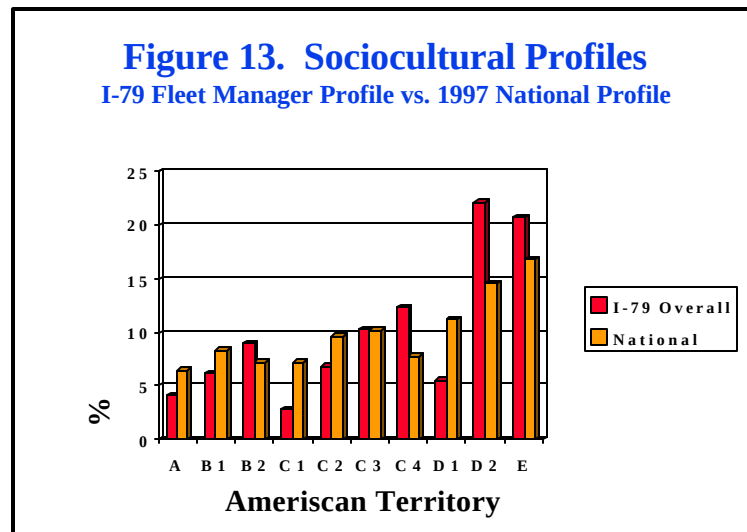
The psychographic survey data collected has yielded information that has permitted us to arrive at some interesting conclusions. This data allows for an understanding of consumer or fleet manager behavior, and thus provides significant valuable information for a strategic marketing effort.

The RISC Ameriscan results by Ameriscan Territory (sociocultural profile) for I-79 Fleet Managers are represented in Figure 12. To gain insight into the sociocultural profiles for each region of the RISC Ameriscan psychographic map, see Appendix A.



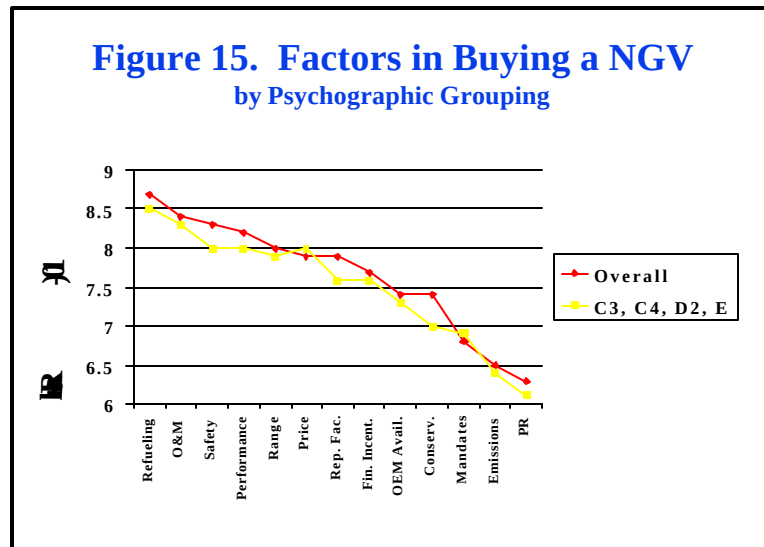
As Figure 12 depicts, the four Ameriscan territories with the most significant number of I-79 Fleet Managers are C3, C4, D2, and E. Slightly more than 65% of the fleet manager population is in the territory grouping C3, C4, D2, and E. Figure 13 shows that the I-79 fleet manager population contains a higher concentration of C3, C4, D2, and E individuals (65.5% versus 49.6%) than the last national RISC Ameriscan profile, performed in 1997 (Kinzler, 1999).

Another trend revealed by the psychographic data is that the percentage of fleet managers in the C3, C4, D2, E territory grouping increases with fleet size (Figure 14). Fifty-eight percent of small fleet managers are in the C3, C4, D2, E territory grouping, with 68.5% of mid-size and 71% of large fleet managers in this grouping. The implication is that small fleet managers tend to be less conservative than managers of large fleets, and may be more accepting of new technology. This seems to be confirmed by the survey results that show that small fleets tend to employ a higher percentage of alternative-fueled vehicles than other fleets.



The sociocultural profile of the C3, C4, D2, E territory grouping and what it collectively represents may give a description or insight into how the majority of I-79 fleet managers think or act when making decisions. As described in Appendix A, some people in this group thrive on emotional intensity and exhilarating experiences. Others prefer the status quo. The glue that holds this group together is that they are all primarily motivated by pleasure and security. They look for instant gratification and focus on the short-term gain. People who fall within these territories can be strategic opportunists, sometimes willing to take risk for personal gain. The need for security can lead them to feelings of financial concern and fear of the future. They tend to possess a lower social commitment – sometimes to the point of being fashionably antiestablishment. They are characterized as being individualistic, but they are social. In the following section, the impact of these attributes on developing an effective marketing campaign is discussed.

As shown in Figure 15, the top factors considered when buying a natural gas vehicle as ranked by fleet managers in the C3, C4, D2, and E grouping appear to be consistent with those items ranked overall by the entire I-79 fleet manager population polled in the survey. This information is significant because a marketing strategy that is developed to appeal to the sociocultural profile grouping for C3, C4, D2, and E individuals will at the same time address a large segment of the fleet manager population. The message delivered will be specific and focused; however, it will address the top issues of importance to the fleet manager population as a whole.



Framework For Developing A Marketing Strategy

Three types of market data (*demographic*, *fleet specific*, and *psychographic*) were collected for this analysis from fleets operating along the I-79 corridor. By combining the unique market component, psychographics, with the conventional fleet market data, winning marketing strategies can be developed. The psychographic profile provides an understanding of “why” fleet managers buy the fleet vehicles that they buy. This understanding allows marketing strategies to be developed that will most successfully appeal to the region’s fleet managers resulting in an increased use of natural gas as a transportation fuel.

This section is not meant to be a detailed marketing plan, but rather to provide a framework for natural gas stakeholders to use to develop their marketing plans and advertising campaigns. This framework is based on what has been learned about the decision-making of I-79 fleet managers, and it considers the strategic issues and barriers to the use of natural gas that were identified by the survey. Based on the demographic survey results, target market segments have been determined. And based on the psychographic profiles of the fleet managers, marketing messages have been outlined.

Demographic Market Segments

A review of the I-79 fleet manager demographics can be interpreted as five distinct market segments. These segments are listed in Table 11 along with general descriptions.

Table 11. I-79 Fleet Manager Market Segments

Segment I	Fleets with no NGVs, and no plans to use NGVs in the future.	59%
Segment II	NGVs are currently used, but plans are to decrease use.	6%
Segment III	Bi-fueled vehicles in the fleet, but are not operating on natural gas much of the time.	see note
Segment IV	Fleets with NGVs that expect to maintain current usage. No plans to add more NGVs.	25%
Segment V	Fleets with one or more NGVs with plans to add additional NGVs. Role models for natural gas use as a transportation fuel.	10%

Note: Segment III is a cross-section of Segments II, IV, and V. The actual size of this market segment could not be calculated directly from the data obtained in the survey.

These segments cover a broad range of fleets from those with no NGVs to those that currently employ NGVs and plan to add more. Based on the fleet manager responses to questions regarding current and future use of alternative-fueled vehicles, a rough breakdown of the size of each market segment was determined where possible.

Psychographic Strategies

As mentioned previously, the majority of I-79 fleet managers polled in the survey fall into the American territories C3, C4, D2 and E, which are located in the southeast corner of the American map (see map in Appendix A). The key attributes shared by individuals in this quadrant of the map include pleasure, security, instant gratification, individualism, and suspicion of change. Obviously, not every fleet manager in this quadrant of the map possesses all of these tendencies. However, by taking all of these attitudes and opinions into account, the message is likely to have impact on the group as a whole.

The survey results confirm that the fleet managers in the C3, C4, D2, and E grouping have the same concerns and issues as the entire I-79 fleet manager population polled. Therefore, although the message may be focused to appeal to the attitudes of fleet managers in the C3, C4, D2, and E grouping, it will still address the top issues of importance to the fleet manager population as a whole.

Refueling convenience, operating and maintenance costs, safety, performance, and range all ranked as most important issues with respect to operating natural gas-fueled vehicles. Additionally, the survey results revealed that a significant fraction of existing bi-fueled vehicles are not operating with natural gas as its primary fuel.

Based on the attitudes and opinions described above for I-79 fleet managers, several strategies are suggested:

- Because of this group's high expectations of products and purchases, the immediate results of using natural gas fuel should be described. These results could be expressed in terms of cost savings since financial concerns are also a priority of this group. In fact, all advantages of using natural gas vehicles and natural gas as a transportation fuel should be highlighted.
- Although this group appears willing to take some risk if it will provide instant gratification or short-term gain, their suspicion of change makes them reluctant to try new technologies, such as NGVs. These individuals will be reassured by showcasing the proven track record of natural gas vehicles of using natural gas as a transportation fuel. Describing the expected vehicle range, listing locations of refueling stations, and providing proof that performance equals or exceeds that of conventional vehicles are also likely to be successful strategies.
- This group prefers information that is clear and to the point. Therefore communications should be quick to emphasize the quality, value and low risk of employing natural gas vehicles in the fleet.

- This group responds well to statistics and facts that show proof as to why they should purchase a product. Therefore, an effective marketing strategy might present quantitative measures of the advantages of operating fleet vehicles on natural gas. Calculations of O&M cost savings and payback period, for example, could be quite effective.

For example, the Southern California Gas Company developed a model to determine payback period. It considers all levels of government tax incentives (such as West Virginia's program to reimburse 100% of the cost of after-market conversion over a three year period as well as the federal government \$2000 maximum tax deduction under EPACT), vehicle mileage, fuel cost, and incremental purchase cost. In some situations, the model was able to predict payback periods of less than one year (GRI, 1998).

- Since this group tends to fear change, marketing campaigns might highlight the fact that natural gas has been used as a clean, safe, and efficient energy source for years in home heating and cooking. Its use as a transportation fuel is a logical next step.
- This group is not strongly motivated by ethical concerns like environmental issues. It is not surprising, then, that fleet managers did not rank reduced emissions or public relations benefits as important factors. It would not likely be beneficial to focus on these issues as part of the marketing strategy.

Suggested Industry Actions

A marketing campaign targeted at a select segment and focused to appeal to the attitudes and opinions of the fleet managers in that segment will hopefully move these decision-makers into the desired course of action. However, increasing natural gas use can also be accomplished by using a variety of other mechanisms. It cannot be overlooked that certain specific actions, if taken by natural gas stakeholders, have the potential to significantly impact the use of natural gas in the region.

For example, concern over refueling and vehicle range can be reduced or eliminated if OEMs produce vehicles with greater range and an ample margin of safety. Likewise, natural gas suppliers can ease this situation by providing sufficiently distributed refueling stations to ensure that refueling is convenient.

OEMs could also provide statistics that prove that these vehicles have low operational costs. And local dealerships can showcase regional fleets that have success stories with NGVs. Local NGV dealerships could also better support the sales and repair services of OEM NGVs. But until a market is established, OEMs will likely need to provide financial support to these dealerships.

Local vendors that specialize in after-market conversions might offer to provide fleet evaluations to identify potential candidates in the light- and mid-duty truck class for possible conversion.

Federal and state governments also play an important role in providing financial incentives that reduce or eliminate the incremental cost of purchasing NGVs. These incentives can be in the form of income tax credits, special or reduced fuel excise tax, reduced sales tax on fuel and after-market conversion equipment, rebates on vehicle conversion costs, and low-interest loans for NGV purchases (Whalen and others, 1996). Even though the survey results indicate that financial incentives and mandates are not a high priority in deciding to purchase an NGV, these credits can be used in the calculations of payback to show short-term payback periods are possible.

Outreach campaigns, such as workshops and training, sponsored by natural gas stakeholder organizations, are also needed to inform fleet managers of the tax incentives available, of the safety record of NGVs, of the requirements of EPACT, and to increase familiarity with owning and operating NGVs.

Conclusion

The data collected in the survey indicates that increasing the use of natural gas as a transportation fuel along the I-79 corridor by increasing the number of NGVs within the regional fleets will be a challenge.

In order to influence additional fleet managers to consider purchasing NGVs, the message will need to be modified. NGVs have historically been marketed with two messages: 1) social conscious message, and 2) financial gains message. According to the psychographic analysis, the message of social conscious, i.e., natural gas as a clean domestic fuel, is not well received by this group. In addition, financial gains have been explained in a way that presents an added inconvenience today (additional expense for the vehicle, possibly inconvenient refueling, added mechanical knowledge) for a possible return over an extended period of time (lower fuel cost, longer engine life, and in some cases possible cost recovery by taking advantage of tax incentives). Neither of these messages is likely to motivate this psychographic group into action.

The analysis determined that the majority of I-79 fleet managers polled are primarily motivated by their need for security and their desire for pleasure. An effective marketing campaign must appeal to these motivators.

To reassure fleet managers about NGVs, the proven track record of these vehicles should be showcased. One possible way to do this is to provide examples of leading companies that have financial and operating successes with NGV fleets. Another means of appealing to this group's need for security is to emphasize the historical safe, clean and efficient use of natural gas. Explain that the same fuel that has been used to heat homes for years can now be used safely and economically to fuel vehicles.

To appeal to this group's need for instant gratification, it is critical to describe the immediate gains from using NGVs (short-term payback, as an example). And since this group responds well to statistics and facts, it would be most effective to describe this gain in quantitative terms (show calculations of payback period with a given natural gas price, vehicle mileage, and initial investment cost). Considering this group's desire for pleasure, the use of NGVs must be presented in a way that does not imply any added inconvenience. Refueling, maintenance, and performance must be shown to be comparable to traditional gasoline-fueled vehicles.

There is great potential to influence the majority of fleet managers to consider adding natural gas vehicles to their fleets, and thereby increase the use of natural gas as an alternative transportation fuel, by developing marketing efforts based on the insight provided through the psychographic profile. However, other actions, if taken by industry, may prove to be every bit as valuable. These include training and workshops to provide educational outreach, improved vehicle range and OEM vehicle availability, commitment to NGV sales and service through local dealerships, and installation of additional refueling stations.

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Appendix A: What Is Psychographics?

Psychographics

Psychographics is the analysis of personality traits and lifestyle. It assesses what people do (activities, buying behaviors, and interests) and how they feel about life (attitudes, interests, opinions, and perceptions). These attributes are often strong determinants of a consumer's use of goods and services. Psychographics explain “why” consumers make their decisions, unlike demographic information (such as age, educational background, gender etc.), that can only describe “who” the consumers are in a particular market. Understanding consumer behavior aids the strategic marketing effort in the following ways: the product can be better designed to meet market needs, the appropriate media vehicles can be selected for conveying the strategy, the most effective “message” can be developed for the advertising campaign, and the risk of product introduction can be minimized (Piirto, 1991).

To perform a psychographic market assessment, a survey instrument with attitude, interest, and opinion statements must be used. The survey is administered using a scale basis (for example: never, sometimes, often, and always). Factor and cluster analyses are used to reduce the results to a manageable number of groups, called market segments. These segments are named and described by the like views (called sociocultural profiles) of those respondents within the group.

RISC Ameriscan

A commercially available psychographic marketing tool, RISC Ameriscan, was used for the market analysis performed in this project. RISC Ameriscan categorizes respondents in a two-dimensional space using two principle axes (Figure A1) (RISC Guidebook, 1997). The axis that points north to south is a measure of a person's acceptance of change (*Exploration*) or their resistance to change (*Stability*). The east to west axis plots pleasure-oriented and individualistic attributes (*Pleasure*) versus ethical and community-oriented ones (*Ethics*).

The individual responses are clustered using statistical methods into ten segments, called “territories,” labeled A through E for identification (Figure A2). Each of these territories has a unique sociocultural profile. This profile provides an understanding of why people in the territory buy what they buy so that marketing strategies can be developed to attract them to specific products and services.

**Figure A1. RISC American's
2-Dimensional Space**

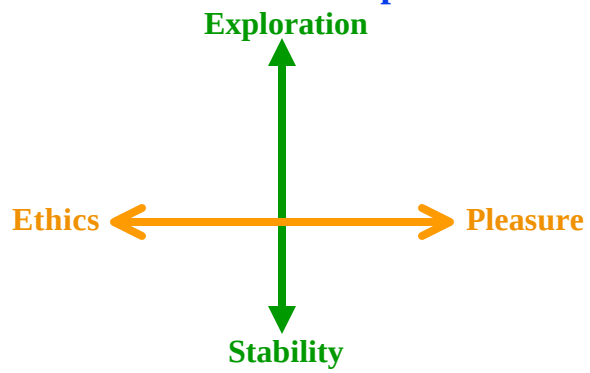
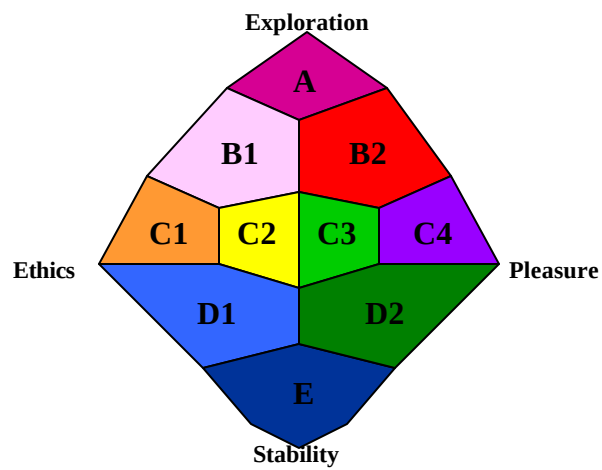


Figure A2. RISC American Map



Sociocultural Profiles

The sociocultural profile for **Territory A** describes consumers in this group to be extremely open to change. They are trendsetters with their own sense of style. They do not depend on the opinions of others when making purchasing decisions, but rather they rely on their own instinct. An effective advertising campaign for those in **Territory A** should focus on their curiosity of the unusual and unfamiliar.

Territory B1 consumers are far to the *Ethics* side of the east-west axis on the Ameriscan map. They live by a firmly established set of core values and traditions, with a strong dedication to family, church and community. They tend to be natural leaders. The nurturing tendency of **B1s** results in a strong sense of responsibility for the comfort and well being of others. They prefer products that not only benefit themselves, but also offer benefits to the family, community or environment.

Territory B2 is on the *Pleasure* end of the east-west axis. These consumers live life to the fullest, readily accepting challenges and often taking impulsive risks. They are strongly individualistic and are not swayed in their decisions by brand, product, salesperson or peer pressure. They are willing to pay more for what they want. To capture the interest of **B2s**, the advertising campaign must appeal to their sense of difference, style and sophistication.

Those in **Territory C1**, much like **B1s**, value tradition and moral standards. However, they are reassured by stability as indicated by their position on the *exploration/stability* axis. They lead routine lives and find solace in familial bonds and ties to the past. Their views of duty and morality are often at the expense of personal gratification. They are moved by campaigns that promote goodwill, like those that donate money or equipment to schools for every purchase, and they favor well-known brands.

Territory C2 is on the borderline of the east-west axis. Members of this group struggle to reconcile the need to explore their individuality with their sense of duty to the common good. **C2s** are tentative and rely on the positive reassurance of others. The best way to reach **C2s** is to use simple, straightforward messages with reassurances and guarantees.

C3s are very competitive and materialistic. Driven by personal recognition and immediate gratification, they are anxious to indulge in pleasure. They place great value in awards, trophies and material possessions. **Territory C3** consumers are best reached by ads that emphasize fun, self-indulgence, and immediate and noticeable advantages from products or services. They like products that attract attention.

Overt materialism and the need for excitement and pleasure characterize **Territory C4**, which is located on the *Pleasure* end of the east-west axis. These

consumers are intense and self-centered. With a strong desire to express their uniqueness, **C4s** tend to be fashion leaders. They easily switch brands because they are attracted to the “new.” The most effective marketing campaign for **C3s** stresses the cutting edge, self-indulgence, and excitement and will be visually stimulating to appeal to the short attention span of this group.

Stability and a strong value system characterize **Territory D1**. Members of this territory fear uncertainty and are comforted by strict rules, consistency, familiarity, and clearly defined roles. They cling to routines, often buying products out of habit rather than brand loyalty. Well-known brands that are easy to buy and use appeal to their sense of stability; however, price incentives, promotions and gimmicks can sway them in their product selection.

Those members of **Territory D2** need to be recognized as individuals and to be provided with options and alternatives that allow them freedom of expression. They are whimsical and spontaneous, making it difficult to create a strong brand following. However, **D2s** have a strong need to be recognized, so they tend to gravitate to well-known brands to have their choices noticed and approved by others.

At the far south of the map, **Territory E** consumers value security above all else. They are reluctant to change and become defensive when confronted with the unfamiliar. Because having “things” makes **Es** feel safe, they tend to save and concentrate on acquiring assets. As consumers, they have a high level of expectation from products and services, wanting to see immediate results. Marketing campaigns should not appear challenging or threatening to the **E1** consumer and must stress quality, value, and low risk.

Appendix B:

Survey: Part One, Technical Questions

1. Which of the following apply to you...? (Circle all that apply)

- 1 Current Fleet Manager or Representative
- 2 Personal Owner of a Natural Gas vehicle (Originally equipped)
- 3 Personal Owner of a natural gas vehicle (Retrofit for natural gas)
- 4 None of the above

2. How many vehicles in your fleet are...(record exact number)

Light Duty (Cars, Pick-up trucks, Mini/Full size vans...< 8,500 lbs.) _____

Light Truck/Step Van (City Delivery, Large Walk-in...8,500-19,500 lbs.) _____

Medium Truck (Class 6, School Bus, 19,501 - 26,000lbs.) _____

Heavy Truck (Tow Truck, City Transit, Construction Equip...26,000+lbs.) _____

3. Please approximate on average how many miles one of your typical fleet vehicles travels per year. _____

4. Where do you refuel your vehicles? (Please circle one)

- 1 At a Company-owned site
- 2 Non-Public – Fuel purchase agreement
- 3 Public Station – Fuel purchase agreement
- 4 Public Station – Fuel or Credit Card

5. How many vehicles in your current fleet are bi-fueled vehicles? _____

(fueled with gasoline and natural gas)

6. How many of your current bi-fueled vehicles operate on natural gas for more than half of their use? (record exact number) _____

7. How many vehicles in your current fleet are...?

Dedicated natural gas vehicles _____

Gasoline-fueled-only _____

Diesel-fueled only _____

8. In the year 2001, how many vehicles in your fleet do you anticipate will be...?

Gasoline or diesel-fueled _____

Bi-fueled _____

Dedicated natural gas vehicles _____

9. If you aren't planning to purchase or lease any additional natural gas-powered or bi-fueled vehicles, specifically, why not? _____

10. Are you aware of the Energy Policy Act of 1992 (EPACT) mandating the purchase of specified levels of alternative-fueled vehicles in your fleet over the next few years (depending upon certain requirements such as fleet size, population, non-attainment zones, etc.)?

- 1 Yes 2 No

11. In which of the following counties do your fleet vehicles routinely drive ON or NEAR I-79? (circle all that apply)

- | | |
|---------------------------------|-------------------|
| 1 Erie, PA | 10 Monongalia, WV |
| 2 Crawford, PA | 11 Marion, WV |
| 3 Mercer, PA | 12 Lewis, WV |
| 4 Lawrence, PA | 13 Gilmer, WV |
| 5 Butler, PA | 14 Braxton, WV |
| 6 Beaver, PA | 15 Clay, WV |
| 7 Allegheny, PA | 16 Roane, WV |
| 8 Washington, PA | 17 Kanawha, WV |
| 9 Green, PA | 18 Harrison, WV |
| 19 DO NOT TRAVEL ON/AROUND I-79 | |

12. Which of the following describes your belief about how safe (crash safety, vehicle handling & operation) a natural gas vehicle is compared to a gasoline powered vehicle. (Circle one)

- 1 Safer than a gasoline-powered vehicle
2 As safe as a gasoline-powered vehicle
3 Not as safe as a gasoline-powered vehicle
4 Don't know

13. Please rate the following factors on a scale of 1 to 10, with 1 being *not* important and 10 being *extremely* important, in your decision to purchase a natural gas vehicle. (Record number from 1-10)

- _____ Purchase or lease price of vehicle
_____ Operating and maintenance cost
_____ Vehicle performance
_____ Tail-pipe emissions
_____ Government mandates to use alternate-fueled vehicles
_____ Financial incentives (tax credits, grants)
_____ Safety (crash safety, handling & operation)
_____ Vehicle driving range
_____ Refueling convenience
_____ Repair facilities
_____ Availability of OEM (original equipment manufacturer) vehicles
_____ Public relations benefit
_____ Concern about U.S. energy conservation