Executive Summary

The following report was developed in response to the 2016 House Joint Memorial (HJM) 5. HJM 5 outlines the importance of increasing natural gas vehicle (NGV) use in the United States (U.S.) and New Mexico. Further, the Memorial directs that the NGV market potential in New Mexico be studied and a subsequent report be developed by the State of New Mexico Energy Minerals and Natural Resources (EMNRD), Economic Development, and General Services Departments. The purpose of the report is to provide insight on how to further develop the natural gas vehicle market and fueling infrastructure for governmental and private use in New Mexico.

The New Mexico Natural Gas Vehicle Report (NGV Report) summarizes natural gas for transportation and NGV use on a national and state level, current NGV programs in surrounding states and potential federal funding opportunities. The NGV Report concludes with recommendations as to how New Mexico can benefit from transportation fuel diversity.

Natural gas vehicles operate on the same principles as computer-controlled, spark-ignited and compression-ignited, gasoline and diesel powered vehicles, providing a familiar vehicle engine platform, but with a fuel system that uses natural gas. Natural gas is also a truly domestic resource that is produced in New Mexico. The oil and gas industry provides hundreds of millions of dollars to the state’s General Revenue fund and is one of the largest employers in the state.

At present, New Mexico’s use of natural gas as an alternative transportation fuel is much less than in surrounding states. Texas, Colorado, Oklahoma, and Utah all have more robust state programs in place that benefit from incentives and other statutory requirements to promote NGV infrastructure and NGV use in both the private and public sectors. The chart below shows the types of incentives and requirements that these states are using successfully to grow their NGV market.

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* DOE AFDC Existing and Planned CNG & LNG Stations (Oct 2016) – 2045 total stations
* 160,000 NGVs per NGVAmerica (2016)
In addition to the development of the NGV Plan, the workgroup of EMNRD, the New Mexico NGV Coalition, the Land of Enchantment Clean Cities Coalition, and the New Mexico Gas Company are continuing to promote the use of NGVs through the development of a pilot project that incorporates NGV fleets and infrastructure in the Santa Teresa, New Mexico border region of the state. New Mexico has pioneered NGVs since the 1980s. While efforts in New Mexico may seem insignificant compared to the surrounding states, New Mexico’s experience with NGVs is considerable. These resources can be brought to the pilot project in Santa Teresa and other NGV projects going forward.

Santa Teresa is currently violating the federal 2015 Ozone National Ambient Air Quality Standard (NAAQS). Due to the area violating the federal Ozone NAAQS, the state is required under the federal Clean Air Act to develop a “nonattainment plan” for the area demonstrating how the state will reduce emissions that are contributing to the violation of the Ozone NAAQS. One of the primary, controllable sources of ground level ozone pollution is nitrogen oxides (NOx). One of the primary, controllable sources of NOx within the Santa Teresa area is vehicle emissions. To reduce NOx emissions within this area, the pilot project aims to convert several current diesel truck fleets that run within the Santa Teresa North American Free Trade Agreement (NAFTA) region to operate on compressed or liquefied natural gas. The pilot project also aims to provide a natural gas fueling station at the Santa Teresa Industrial Park that is located along Pete V. Domenici International Highway. The workgroup for the pilot project is looking into federal and other incentives that could be used for fleet conversions and NGV fueling station development.

The conversion of diesel fleets to natural gas in Santa Teresa could not only help reduce NOx emissions and assist the state with complying with the 2015 Ozone NAAQS, but also provide commercial fleets with a fuel that historically costs less than diesel. The pilot project was created out of the development of the NGV Report and incorporates the concepts discussed in the report. The workgroup plans to update the legislature in the future on the status of the pilot project and general trend of the NGV industry.

Other potential projects could include the onsite processing of the natural gas from the different natural gas basins located in New Mexico, such as onsite processing of natural gas for oil and gas fleets, electric generation, or distribution. The New Mexico Energy, Minerals, and Natural Resources Department and the New Mexico State Land Office are currently exploring how best to utilize the state’s natural gas resources, reduce flaring and increase natural gas royalties for the state.

Projects such as the Santa Teresa NGV pilot and onsite processing of natural gas will provide a model for other NGV projects in the state, thereby growing the NGV market in New Mexico using partnerships between government and business. Combining federal and state funds from grants and other incentives that are matched by fleets and station builders/owners, will increase the market for New Mexico natural gas while providing a cleaner and lower cost fuel to the fleets in the state and promoting new jobs for New Mexicans.
Introduction

New Mexico 2016 House Joint Memorial 5

House Joint Memorial (HJM) 5 was passed unanimously during the 2016 State of New Mexico Legislative Session. HJM 5 outlines the importance of increasing natural gas vehicle (NGV) use in the United States (U.S.) and New Mexico and mandates that a study be developed on how to build the NGV market in New Mexico. HJM 5 establishes that a report be developed by the State of New Mexico Energy Minerals and Natural Resources (EMNRD), Economic Development, and General Services Departments. The purpose of the report is to provide insight on how to further the development of the natural gas vehicle market and infrastructure for governmental and private use in New Mexico.

NGV History in New Mexico

New Mexico has proven to be an early leader in the natural gas transportation fuel market. The Santa Fe Trails bus system was the first 100% natural gas dedicated bus fleet in the United States. As the highest altitude natural gas fleet in the country, Santa Fe Trails continues to operate all compressed natural gas (CNG) buses at great savings to the taxpayer. Albuquerque city fleet operates over 100 CNG vehicles and over 70 CNG transit buses. Natural gas competes favorably against gasoline and diesel with a historical fleet savings of $1.00 per gasoline gallon equivalent. Considered along with the revenues generated by natural gas production, its use benefits the people of New Mexico through the General Fund and other revenues that go to public schools and colleges, public roads, buildings, state parks and state government. This is not the case for imported oil that contributes to our growing national trade deficit.

According to the U.S. Energy Information Administration (EIA), the U.S. imported approximately 9.4 million barrels per day (MMb/d) of petroleum from about 82 countries in 2015. Petroleum includes crude oil, natural gas plant liquids, liquefied refinery gases, refined petroleum products such as gasoline and diesel fuel, and biofuels including ethanol and biodiesel. About 78% of gross petroleum imports were crude oil.

New Mexico Natural Gas Vehicle Coalition

The purpose of the New Mexico NGV Coalition is to advance the building of NGV infrastructure and adoption of natural gas vehicles in New Mexico, and to increase the usage of New Mexico natural gas within the state. This is accomplished through planning for strategic infrastructure placement; connecting stakeholders to create necessary fueling infrastructure; engaging appropriate fleets and vehicles with customers; and involving state and local governments. Key stakeholders include natural gas producers, local distribution companies, private companies, government entities and non-government entities. The Coalition also includes other organizations such as environmental and economic groups. Current stakeholders include Apache Corp, Williams, New Mexico Gas Company, Clean Energy Fuels, New Mexico Energy, Sparq Natural Gas, Aztec Well, XTO Energy, Concho Resources, Fiat Chrysler Automobiles, Acorn Petroleum, Waste Management, JW Energy, New Mexico Trucking Association, New Mexico Energy, Minerals and Natural Resources Department, state fleets,
county and local governments, schools, Land of Enchantment Clean Cities Coalition, and the New Mexico Oil and Gas Association.

**New Mexico Land of Enchantment Clean Cities Coalition**

The New Mexico Land of Enchantment Clean Cities Coalition was established in 1994 and is part of the U.S. Department of Energy's (DOE’s) Clean Cities program. The mission of the U.S. DOE Clean Cities program is to advance the nation's economic, environmental, and energy security by supporting local actions to cut petroleum use in transportation. The New Mexico Land of Enchantment Clean Cities Coalition supports and develops the expanded use of alternative transportation fuels and technologies that reduce traditional gasoline and diesel usage while reducing emissions and helping the local economy.

**Natural Gas**

The utilization of shale plays for natural gas extraction has dramatically changed the prospects for the natural gas economy. As Figure 1 below shows, there are currently many different plays being use for natural gas extraction in the lower 48 states. The shale plays in New Mexico include the Lewis, Abo-Yeso, Glorieta-Yeso, Bone Spring and Mancos. New technological advances have allowed greatly expanded supplies of natural gas to become available, and the prospects of the lifecycle of natural gas in the market have gone from a few years to more than one hundred years.

**Figure 1: Shale Plays**
North American natural gas supplies are abundant, affordable, reliable, efficient and clean. The U.S. proved reserves of natural gas have been increasing since 2001 (Figure 2). Natural gas plays an integral role in reducing emissions and our dependence on off-continent oil sources. Historically, natural gas has been utilized primarily for home heating, cooking, compressed fuel gas and some peak power generation, leaving natural gas power plants underutilized and therefore less efficient. By using the excess supply of natural gas to displace a significant portion of gasoline and diesel in transportation, we can increase jobs, improve air quality, add to the financial resources of New Mexico, and minimize reliance on off-continent sources of oil.

Figure 2: Proved Natural Gas Reserves in the United States

![U.S. Proved Reserves of Natural Gas from 2001-2014](image)

Natural Gas is not only an important commodity to New Mexico, but also the entire nation. Approximately, 97% of the natural gas used in the U.S. comes from North America. The EIA projects that natural gas production in the U.S. will rise by an estimated 44% over the next 30 years, with most of that increased production coming from shale gas extraction. Shale gas is expected to grow from 7.8 trillion cubic feet in 2011 to 16.7 trillion cubic feet in 2040.

The contribution of natural gas jobs to America is clear. Natural gas not only provides the U.S. with a clean, abundant and reliable energy source that is domestically sourced but also with millions of good paying American jobs and billions in revenue. According to an in-depth economic analysis completed in 2009 by IHS Global Insight, the Natural Gas industry supports more than 2.8 million jobs in the United States. The economic impact of the industry is notable as well: Natural gas contributed $385 billion to our nation’s economy in 2008 alone.
Natural Gas Vehicles and Fueling Stations

Natural Gas Vehicles
Natural gas vehicles operate on the same basic principles as computer-controlled, spark-ignited and compression-ignited, gasoline powered vehicles. The fuel is injected above or below the throttle where it is mixed with air and drawn into the cylinder. A spark plug ignites the fuel/air charge in the combustion chamber, moving the pistons up and down and turning the crankshaft.

Natural gas can power the same vehicles currently powered by gasoline and diesel fuel including vehicles from single passenger utility vehicles to large off-road vehicles and stationary engines. Because methane (CH₄), the principle component of natural gas is the simplest hydrocarbon and considered a “light end” in the hydrocarbon family, it can withstand tremendous pressure and heat in the combustion chamber without problems associated with other gaseous fuels and liquid fuels that tend to ignite more unpredictably. This makes natural gas a very robust fuel.

Further, because methane has a low hydrogen-to-carbon ratio, less carbon is produced in the exhaust and deposited in the crankcase oil. Natural gas is also vaporous in the combustion chamber; which unlike liquid fuels does not wash lubricants off the engine’s cylinder walls. This results in less engine wear and fewer oil changes. However, since natural gas is a gas rather than a liquid at standard pressure and temperature, some modifications are required to make a NGV work efficiently. These changes are primarily in the fueling receptacle/nozzle, fuel supply tubing, fuel pressure regulator, fuel storage tank(s) as well as the fuel injection system.

Natural gas is stored on vehicles in two forms: compressed and liquefied. It is produced from traditional and non-traditional gas extraction methods and can also be extracted from biomass, (typically manure, landfill or municipal waste water) which is considered a renewable process.

Figure 3 below shows the forms of natural gas when used as a transportation fuel. Note the various types of vehicles that are most appropriate for the specific form of fuel (compressed or liquefied natural gas). Storage volume is a major decision factor in choosing the form of fuel since compressed tanks are larger than liquefied tanks when comparing equal amounts of energy produced. Below is a list of facts on the use and benefits of natural gas a vehicle fuel.

- Natural gas is considered an alternative fuel.
- Natural gas vehicles work similarly to gas-powered vehicles and have spark-ignited and compression-ignited engines.
- Natural gas vehicles are highly effective in reducing greenhouse gas emissions, fuel costs, and reliance on off-continent oil.
- Natural gas vehicles mainly burn methane which is the simplest of all hydrocarbon fuels, with high hydrogen to carbon ratio.
- Methane produces less carbon dioxide (CO₂) than all other hydrocarbons when combusted. Compared with gas- and diesel-fueled vehicles, natural gas vehicles produce approximately 93% fewer toxins.
- The conversion of one refuse truck to natural gas is the equivalent to removing 325 cars from the road, in terms of greenhouse gas emissions, carcinogenic and toxic pollutants, nitrogen oxides and particulate matter.
• Natural gas powered vehicles with optimized engines and customized fuel and ignition controls produce the same if not better gas mileage per gasoline gallon equivalent.
• Natural gas engines that are used in place of diesel engines can actually produce more torque at lower revolutions per minute (rpm’s) because natural gas is already a vapor and combusts easily at very low air temperatures, which increases low-speed torque and improves efficiency.

Figure 3: Natural Gas Fuels for Transportation

With roughly 15.2 million natural gas vehicles on the roads worldwide, NGVs already have a notable presence. Every major auto manufacturer, including Ford, Fiat Chrysler and General Motors currently make or are developing natural gas models for markets in many countries. Today’s significant natural gas supplies can provide the displacement of 100 percent of the petroleum used in heavy-duty vehicles and still be abundant. Many fleets and municipalities are converting vehicles to natural gas or purchasing new natural gas vehicles. This petroleum displacement will enhance America’s ability to reduce our dependence on off-continent sources of oil.

Many of today’s cars and trucks can be converted to natural gas for individual and fleet use, and a growing number of companies and organizations are providing conversion services. For vehicles that are converted to run on natural gas, the federal Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) require the manufacturers of equipment prove that the conversions meet emissions and onboard vehicle diagnostics interface requirements. The federal government’s certification requirements apply to all alternative fuel vehicle retrofit systems. The costs for converting a new vehicle range from $8,000-$75,000 based on the size of the vehicle and fuel tank and other considerations. Strict EPA rules cover the manufacture, sale, and installation of alternative fuel conversion systems. These regulations do not allow consumers to install retrofit kits themselves. EPA considers non-certified installations as representing "tampering with a federally approved emission control system," an act punishable by a substantial fine. EPA certified engine conversion systems are not sold to untrained or
unapproved installers. Certified installations also protect the manufacture’s vehicle warranty. Figure 4 below shows the schematics of a natural gas fueling system.

Compressed natural gas and liquefied natural gas vehicles are available as dedicated natural gas vehicles, dual-fuel or bi-fuel vehicles which run on gasoline and natural gas. Historically, CNG vehicles have been manufactured for foreign countries - mainly Europe, Brazil, India and China. Many are made by multi-national U.S. auto companies such as Fiat Chrysler, Ford and General Motors, while others are manufactured by companies occupying a large market share in U.S. automotive sales - Volkswagen, Volvo, Mercedes-Benz, Hyundai and Mitsubishi.

Figure 4: Schematics of Natural Gas Fueling System

Source: DOE/AFDC. CNG enters the vehicle through the natural gas fill valve (A) and flows into high-pressure cylinders (B). When the engine requires natural gas, the gas leaves the cylinders and passes through the master manual shut-off valve (C). The gas travels through the high-pressure fuel line (D) and enters the engine compartment. Gas enters the regulator (E), which reduces the gas pressure used for storage (up to 3,600 psi) to the required vehicle fuel injection system pressure. The natural gas solenoid valve (F) allows natural gas to pass from the regulator into the gas mixer or fuel injectors. The solenoid valve shuts off the natural gas when the engine is not running. Natural gas mixed with air flows down through the carburetor or fuel-injection system (G) and enters the engine combustion chambers where it is burned to produce power, just like gasoline.

Natural Gas Fueling Stations

There are two types of CNG stations: fast-fill and time-fill. Fast-fill stations (Figure 5) are best suited for retail situations where vehicles arrive randomly and need to fill up quickly. Drivers filling up at a fast-fill station experience similar fill times to a conventional gasoline fueling station—less than 5 minutes for a 20 gallon equivalent tank. CNG at fast-fill stations is often stored in the vessels at a high service pressure (4,300 psi), so it can deliver fuel to a vehicle faster than the fuel coming directly from the compressor, which delivers fuel at a lower volume. Time-fill (Figure 6) stations are used primarily by fleets and work best for vehicles with large tanks that refuel at a central location every night. The time it takes to fuel a vehicle depends on the number of vehicles, compressor size, and the amount of buffer storage. Vehicles may take several minutes to many hours to fill. The advantage of using a time-fill station is less heat of recompression, so you usually get more fill then with a fast-fill station. The type of station needed is dependent on the application. Typically, retail stations use fast-fill and fleets that have central refueling and the ability to fill overnight use time-fill.
LNG stations are structurally similar to gasoline and diesel stations because they both deliver a liquid fuel. LNG dispensers deliver fuel to vehicles at pressures of 30 to 120 psi. Because LNG is stored and dispensed as a super-cooled, liquefied gas, protective clothing, face shield, and gloves are required when fueling a vehicle. There are three options for LNG fueling: mobile, containerized, and customized large stations. In mobile fueling, LNG is delivered by a tanker truck that has on-board metering and dispensing equipment. A starter station, or containerized station, includes a storage tank, dispensing equipment, metering and required containment (Figure 7). A custom station typically has greater storage capacity and is tailored to meet fleets' needs.
CNG and LNG are typically sold in a Gasoline Gallon Equivalent (GGE) or a Diesel Gallon Equivalent (DGE) allowing for a realistic comparison and measurement of off continent fuel displacement.

The following are several average fuel consumption rates for particular vehicle categories.

Consumer: 1,000 GGE / year
Light Duty Field Service Truck: 2,000 GGE / year
Taxi / Shuttle: 5,000 GGE / year
Delivery Truck: 6,000 GGE / year
Transit Bus: 10,000 DGE / year
Trash Truck: 11,000 DGE / year
18-Wheeler (Class 8 Truck): 15,000 DGE / year

Costs of installing natural gas infrastructure varies based on size, capacity, and the type of natural gas (LNG, CNG, or both) it dispenses. Capital investment costs also vary in the way the natural gas is dispensed (fast-fill, time-fill). According to a 2014 report published by the National Renewable Energy Laboratory for the U.S. Department of Energy, costs for installing a CNG fueling station can range up to $1.8 million depending on the size and application. Smaller time-fill fueling units average $10,000, including installation. According to the EIA, an LNG fueling station can range from $1 to $4 million.

There are currently 1736 CNG and 144 LNG public and private fueling stations nation-wide. Fifty-six percent of the public CNG fueling stations in the nation are located in California, Texas, Oklahoma, Utah, Pennsylvania, New York and Wisconsin (Figure 8). This is primarily due to the fact that many of these states have developed natural gas infrastructure incentive programs. These states have incentivized the use of natural gas as an alternative to petroleum fuels to address air quality related issues and to capitalize on the low cost and domestic availability of natural gas.
Although states like California, Texas, Oklahoma, Florida and Colorado are pushing and incentivizing the use of the natural gas vehicles and fuel, much more work needs to be done in the U.S., which has around 163,000 natural gas vehicles on the road. Public awareness needs to be cultivated, infrastructures for distribution and fueling need to be built, and markets for new vehicles as well as conversion services need to be fostered.
Natural Gas in New Mexico

Natural Gas Production in New Mexico

Oil and gas exploration and production in New Mexico has a prestigious 150-year history. Today, New Mexico is one of the leading producers of natural gas in the United States. In fact, New Mexico is one of the top ten producing states and has the largest proven natural gas reserve in the United States. New Mexico natural gas production accounts for four (4) % of the nation’s total. New Mexico’s share of natural gas production has slipped in recent years. This is due to the increased output from shale gas wells in other states and New Mexico's total natural gas production declining. Although New Mexico's total proved natural gas reserves have declined over the past decade, the state's proved shale gas reserves have risen significantly. The San Juan Basin contains one of the largest proven natural gas reserves in the United States. There are also proven natural gas reserves in the Permian Basin. Due to these large natural gas reserves in the state, New Mexico produces more natural gas than it uses and sends natural gas through interstate pipelines to Arizona and Texas and on to markets from the West Coast to the Midwest.

In 2014, New Mexico produced 1.09 quadrillion cubic feet of dry natural gas. Only a limited fraction, 1%, of that gas was used for transportation. Natural gas vehicles are a proven, commercially available technology that reduce emissions and utilize a more affordable fuel. Natural gas is an ideal transportation fuel as it burns more cleanly than gasoline and diesel and is able to stand up to the rigor of both light- and heavy-duty vehicle use. In the past, natural gas was not utilized as a transportation fuel because of the relative abundance and low cost of petroleum products. That has since changed. In the 1970s the U.S. peaked in oil production and was forced to continuously increase oil imports. Although gasoline and diesel prices have fallen over the last few years, the volatility of the costs associated with gasoline and diesel has been constant. This is not the case with natural gas prices. Over that last 16 years the price of natural gas has remained relatively consistent. Figure 9 shows how the market prices for these fuel types have fluctuated over the last 16 years.
Natural gas is truly a domestic fuel, produced in New Mexico. Increased production of natural gas creates jobs in the gas fields. But it also produces skills and jobs in natural gas vehicle fleet deployment, including refueling station construction and maintenance as well as vehicle conversion, maintenance, and operation.

According to the Bureau of Business and Economic Research at the University of New Mexico, oil and natural gas production is the largest civilian employer in New Mexico, accounting for more than 23,000 jobs statewide and provides income to New Mexico residents in excess of $1.8 billion dollars annually. In 2014, oil and gas made up 35% of New Mexico’s General Fund revenue. Figure 10 below shows the share of New Mexico’s General Fund attributed to oil and gas production in New Mexico from 2007-2014.
In addition, the U.S. is at a critical juncture in transportation and energy use. Domestic fuel use and conservation are key components to our country’s future economic stability. New Mexico consumes over nine (9) million gallons of gasoline and over 400 million gallons of diesel annually. If only ten percent of that were displaced by natural gas, our state’s production would increase by 20 billion cubic feet of gas per year.

While this represents only 0.001 % (one thousandth of a %) of our state’s total natural gas production, it is a significant financial benefit to the public. In addition, it is important for New Mexico to support the need to increase demand in our state. For every ten-cent change in the price of natural gas, there is a $12 million positive effect on New Mexico funds.

**Benefits**

**Air Quality**

Natural gas is the cleanest fossil fuel and a highly efficient form of energy. According to the EIA, natural gas is twice as clean as coal. Natural gas also has fewer impurities than other fuels, and produces less sulfur dioxide (a cause of acid rain) and other pollutants. Electric power generation is the largest source of U.S. CO₂ emissions (41%). Within the power sector, coal provides almost 34% of U.S. electricity according to the Edison Electric Institute (EEI). In addition, the EIA reports that the burning of coal emits over 214 pounds (lbs.) of CO₂ per million British Thermal Units (Btu) for electric power generation. According to EEI and EIA, natural gas accounts for 32.5% of U.S. power generation, but in contrast to coal, only produces 117 lbs. of CO₂ emissions per million Btu, see Table 1.
Natural gas is increasingly viewed as a viable solution to reducing our country’s carbon footprint and improving our air quality. When a vehicle runs on natural gas, especially if the engine is optimized for the high-performance characteristics of natural gas, the vehicle will outperform similar vehicles running on conventional fuels. With a significantly higher octane rating and light hydrocarbon constituents, natural gas optimized engines can provide excellent fuel efficiency and lower operating costs – all while offering significant reductions in emissions. According to the EPA, the utilization of natural gas as an alternative transportation fuel reduces 60-90% of smog-producing pollutants and 30-40% in greenhouse gas emissions (see Figure 11). Natural gas is now used for bus, truck, van and taxi fleets as well as passenger vehicles and other specialized uses. With community support and backing by the U.S. DOE’s Clean Cities program, there are an expanding number of natural gas filling stations now available across the United States. NGVs currently use less than one percent of the U.S. natural gas supply but is a promising area for growth as America becomes increasingly concerned about carbon and greenhouse gas emissions.

**Figure 11: Natural Gas Vehicle Emission Reductions**

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Engine technology for natural gas vehicles has also been evolving. New “Near-Zero” natural gas engine technology has NOx emission levels that are 90% lower than current federal air quality standards for such engines. The Cummins Westport ISL G Near-Zero NOx natural gas engine is the first mid-range engine in North America to receive emission certifications from both the EPA and CARB for meeting the 0.02 grams per brake horsepower-hour (g/bhp-hr) optional Near-Zero NOx Emissions standards for medium-duty truck, urban bus, school bus, and refuse applications. CARB has defined this certified Near Zero emission level of 0.02 g/bhp-hr NOx as equivalent to a 100% battery truck using electricity from a modern combined cycle natural gas power plant. The ISL G Near-Zero engine will also meet the 2017 EPA greenhouse gas emission requirements with a 9% greenhouse gas reduction from the traditional ISL G engine. Currently, the Near-Zero 9 liter mid-range engine is available today, but the heavy duty Near-Zero 12 liter engine will be available in late 2017.

**Economics**

*Natural gas is abundant:* Events over the past several years have dramatically changed the prospects for the natural gas economy. New technological advances have allowed greatly expanded supplies of natural gas to become available, and the prospects of the lifecycle of natural gas in the market have gone from a few years to generations.

*Natural gas is affordable:* NGVs are historically cheaper than gasoline vehicles to refuel. Due to the current lower cost of petroleum though, the refueling costs of natural gas and gasoline are relatively comparable at present. This comparable cost, as seen in Figure 9, is not the normal trend though. Over the last six (6) years the average cost of gasoline and diesel has been anywhere from 30% to 46% higher than natural gas. Unlike natural gas fuel costs though, which have remained relatively stable, the cost of gasoline and diesel fuels can fluctuate daily, and as Figure 9 shows, this current price comparison between the fuels will likely not last. Outside of fuel costs, in many cases the maintenance costs for NGVs are lower than traditional gasoline vehicles.

In addition to its economic benefits, many proponents of NGVs argue that a transportation sector more reliant on domestically abundant natural gas will decrease the U.S. dependence on off-continent oil – allowing for a more secure, safer energy supply for the country. As gasoline and diesel prices have escalated and fallen, the cost of natural gas has tended to remain more stable. This stability results in a considerably more predictable cost assumption over an extended period of time.

*Natural gas is safe:* Natural gas is lighter than air, and dissipates into the atmosphere when released. Consequently, when released natural gas rises well out of its flammability range unlike liquid fuels that puddle, presenting a combustible vapor as it evaporates and mixes with air. Methane, the principle component of natural gas, has a very high ignition temperature at 1,000°-1,200°F, whereas gasoline ignites at 495°F and diesel at 410°F. Natural gas also is colorless, odorless and is largely a non-toxic substance that unlike other hydrocarbons does not leak into or impact soil or groundwater when it is accidentally released from a storage container or pipeline.

*Natural gas is a domestic energy solution:* In 2014, the U.S. imported about 27% of the petroleum it consumed, and transportation accounted for more than 70% of total U.S. petroleum
consumption. With much of the world's petroleum reserves located in politically volatile countries, the U.S. is vulnerable to supply disruptions. However, because U.S. natural gas reserves are abundant, this alternative fuel can be domestically produced and used to offset the petroleum currently being imported for transportation use. Because natural gas is used to heat homes, it’s also generally readily available in virtually all parts of the country.

Over the last 30 years, the U.S. dependency on imported crude oil and petroleum products has increased, hitting a peak in 2005 of 13.71 MMbbl/d. Figure 12 below shows the U.S. import of crude oil and petroleum products over the last 30 years. The U.S. EIA reported that in 2015, the U.S. consumed an average of 19.4 MMbbl/d of petroleum products. Of the petroleum consumed in 2015, 48% was imported from other countries outside of the U.S.

**Figure 12: Natural Gas Vehicle Emission Reductions**

![U.S. Imports of Crude Oil and Petroleum Products (MMbbl/d)](image)

Source: EIA

To remove the U.S. dependency on off-continent oil, alternative sources of fuel need to be utilized by the transportation industry. Hybrids are a step in the right direction but still require gasoline and electric vehicles, unless charged through renewable energy or natural gas sources, are run on electricity produced from coal, which doesn’t result in an improvement in air quality or a decrease in CO₂ emissions. Compared to other “alternative fuels,” natural gas makes good sense as the fuel that should be used by the transportation industry to displace imports of off-continent oil.

Natural Gas Vehicles displace off-continent based fuels on a gallon for gallon basis. The production of natural gas domestically is also increasing with imports decreasing. Total dry natural gas production in the U.S. increased by 35% from 2005 to 2013, with the natural gas
share of total U.S. energy consumption rising from 23% to 28%. Natural gas imports also fell in 2015 to its lowest levels since 1986. This decrease is net import of natural gas occurred due to increases in domestic natural gas production. Although both U.S. natural gas consumption and production has increased over the last several years, natural gas production has grown significantly faster resulting in relatively low natural gas prices.

Figure 13: Natural Gas Imports in 2015

<table>
<thead>
<tr>
<th>Natural gas net imports in 2015 at lowest level since 1986</th>
</tr>
</thead>
<tbody>
<tr>
<td>billion cubic feet</td>
</tr>
</tbody>
</table>

- **exports**
- **imports**
- **net imports**


**Natural Gas Consumes Less Water**

Natural gas consumes less water per mile than traditional fuels and agricultural-based fuels (see Figure 14). CNG using electricity for compression uses 6.5 gallons of water per 100 miles driven as compared to 2,800 gallons consumed by ethanol from irrigated corn grain per 100 miles driven.
Current Utilization

Natural gas is predominately utilized in New Mexico for electricity generation and residential heating, see Figure 15. In 2015, 77,947 one million cubic feet (MMcf) of natural gas was used for electricity generation and 34,036 MMcf for residential heating. In comparison though, only 223 MMcf of natural gas was used in the transportation sector, which is less than 1% of the total amount of natural gas used by consumers in 2015.
Historically, vehicle consumption of natural gas fuel has been limited in New Mexico. Although over the last 20 plus years, the usage of natural gas for vehicles has increased, as shown in Figure 16. This increase is due to the utilization of natural gas fueled fleets throughout New Mexico. Both private and public entities are converting from gasoline and diesel fleet fuel to natural gas. Some of the state entities that have converted include:

- The State of New Mexico;
- University of New Mexico;
- City of Albuquerque;
- City of Santa Fe;
- City of Socorro;
- ABQ Ride;
- Albuquerque International Sunport;
- Santa Fe Trails Transit;
- City of Santa Fe Environmental Services;
- Sandia National Laboratory;
- White Sands Main Post; and
- Waste Management.

These conversions to natural gas have included light-duty (gross vehicle weight less than 4,000 lbs.), medium-duty (gross vehicle weight of 10,000-26,000 lbs.) and heavy-duty (gross vehicle weight of over 26,000 lbs.) vehicles. Unlike electric vehicles that have limited towing capabilities, natural gas-fueled vehicles can maintain the same towing performance as diesel fuels, with less air quality and noise pollution.
Figure 16: Natural Gas Consumption for Vehicle Use in New Mexico

Source: EIA
Natural Gas Vehicles in New Mexico

Current Fleets and Vehicles

NGV America estimates that as of 2015 the number of NGVs on the road in the U.S. is around 163,000 vehicles. More than half of those are light-duty vehicles. There are roughly 74,500 medium and heavy duty NGVs on the road. Figure 17 below shows the usage breakdown for those medium and heavy duty vehicles.

Figure 17: U.S. Medium and Heavy Duty NGV Vehicles

In New Mexico, there are only roughly 800 registered NGVs on the road today. The Federal Highway Administration (FHWA) reports that in 2014, there were almost 2 million motor vehicles registered in New Mexico. This number includes both private/commercial and publicly owned vehicles. Of those 2 million vehicles only .04 percent are fueled by natural gas. The Federal Highway Administration also reports that in 2014, almost 1 billion gallons of gasoline was consumed in New Mexico. Although gasoline and natural gas prices are comparable at present, as Figure 9 above shows, this trend is not the norm and will likely not continue. In 2014, gasoline was over a $1.50 more than natural gas fuel. If only 10,000 of the 2014 vehicle fleet in New Mexico were converted to natural gas fuel the potential cost savings is $765.00 a year per car or over $7 million dollars total for the year.

Current Infrastructure

In New Mexico, there are currently 15 CNG and one (1) LNG public fueling stations. As Figure 18 below shows, only eight (8) of the CNG and one (1) of the LNG fueling stations are public. Of the public fueling stations, six (6) are located around the Albuquerque metropolitan area and...
along Interstate 25. There are no stations currently located along Interstate 40 outside of the Albuquerque metropolitan area. Currently there are no planned CNG stations in New Mexico and one LNG station planned for Lordsburg, New Mexico. Figure 17 also highlights potential “gap” stations that could be developed to provide more adequate natural gas fueling coverage for the state. Currently, the states surrounding New Mexico, including Colorado, Texas, Utah, Oklahoma and Arizona have CNG fueling infrastructure along all the major interstate corridors throughout the states.

Figure 18: NGV Fueling Corridor Map

![New Mexico Natural Gas Fueling Stations](image)

Source: New Mexico NGV Coalition

**Increased Natural Gas Utilization**

Several studies have been conducted on the utilization of natural gas for trucking in the United States. A recent study conducted by UC Davis highlights the use of natural gas for heavy-duty trucking throughout the United States. The study found that a greater use of natural gas in the heavy-duty transportation sector could benefit the trucking industry. Below is a list of some of the findings from the study.

- Potentially lower the cost of U.S. freight supply chains, thus enhancing global competitiveness.
- Improves energy security through geographic supply diversification.
- The cost-benefit for natural gas as a direct fuel is most compelling for heavy truck fleets whose vehicles travel 120,000 miles a year or more.
Beyond the use of natural gas for heavy-duty trucks within the trucking industry, natural gas is also being studied and utilized by transit systems and government fleets throughout the United States. Several states and localities have converted to natural gas buses and government fleets to address air quality compliance issues. This air quality management strategy has been utilized by the South Coast Air Basin where 65% of all transit buses are now fueled by natural gas. States and localities are not only looking at how to benefit from the use of natural gas fueled vehicles, but also how to increase natural gas vehicle fueling infrastructure. To increase the use of natural gas vehicles, Utah has worked with a local gas utility to build natural gas fueling infrastructure across the state. Utah is currently one of the top states in the U.S. for the number of natural gas vehicle fueling stations.

To successfully implement a natural gas vehicle and fueling infrastructure program in New Mexico, the state should analyze programs developed by other states such as California, Oklahoma and Utah. Using these existing state programs as models will assist the state in determining the best approaches and integration strategies needed to increase the utilization of natural gas for the state’s transportation needs.
Current Programs in Surrounding States

Current Fleets and Vehicles

Within this regional area, New Mexico currently has the least amount of registered NGVs on the road. This is due in part to the limited number of fueling stations and infrastructure presently available throughout the state. New Mexico’s low number of known registered NGVs within the state could also be due to the fact that New Mexico’s Motor Vehicle Division currently does not have the means to track the aftermarket conversion of gasoline or diesel vehicles to natural gas. Table 2 below lists the registered NGVs in New Mexico and surrounding states.

Table 2: Current NGVs by State

<table>
<thead>
<tr>
<th>State</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Mexico</td>
<td>800</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>3,500</td>
</tr>
<tr>
<td>Texas</td>
<td>11,000</td>
</tr>
<tr>
<td>Colorado</td>
<td>2,500</td>
</tr>
<tr>
<td>Utah</td>
<td>10,000</td>
</tr>
<tr>
<td>Arizona</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Source: New Mexico NGV Coalition

Current Infrastructure

The states surrounding New Mexico have a more extensive natural gas fueling infrastructure system in place. Most of the fueling stations in the surrounding states are located along major interstate corridors. As Figure 8 shows, the majority of CNG fueling stations in Texas are located along the Interstate 20 and 35 corridors. Oklahoma has the most extensive CNG fueling network of the surrounding states. Unlike Arizona, Utah, Texas and Colorado though, Oklahoma has CNG fueling stations throughout the state and not just along the Interstate corridors. Most of the states surrounding New Mexico are also planning to add more CNG fueling infrastructure in the future. Table 3 below shows the number of current and planned public CNG fueling stations for New Mexico and surrounding states.

Table 3: Current and Planned Public CNG Stations

<table>
<thead>
<tr>
<th>State</th>
<th>Current</th>
<th>Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Mexico</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>97</td>
<td>9</td>
</tr>
<tr>
<td>Texas</td>
<td>82</td>
<td>15</td>
</tr>
<tr>
<td>Colorado</td>
<td>21</td>
<td>4</td>
</tr>
<tr>
<td>Utah</td>
<td>45</td>
<td>1</td>
</tr>
<tr>
<td>Arizona</td>
<td>15</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: DOE/AFDC
State Policies and Legislation

Many states throughout the U.S. have initiated and adopted laws, incentives and programs to promote the use of natural gas for alternative fueled vehicles and infrastructure. These programs range from state incentives to private utility investment programs. The following tables show what laws, incentives and programs New Mexico and the surrounding states have currently implemented.

New Mexico

New Mexico currently has a limited number of programs to promote the use of alternative fueled vehicles. The Table 4 below lists New Mexico’s current state laws and programs that incentivize and promote the use of natural gas vehicles and development of vehicle fueling infrastructure.

Table 4: New Mexico State Laws and Programs for NGVs

<table>
<thead>
<tr>
<th>Laws/Program</th>
<th>Description</th>
</tr>
</thead>
</table>
| New Mexico 2015 Energy Policy and Implementation Plan    | The goal of the New Mexico 2015 Energy Policy and Implementation plan revolves around objectives that are comprehensive enough to incorporate all of the state’s energy resources but includes definitive opportunities to allow for accountability in success. These include a focus on economic growth and job creation as well as identifying incentives that increase market potential. The plan considers both near-term and long-term objectives that can be measured and adjusted to conditions in the energy economy. The natural gas market enhancement recommendations in the plan include:  
  • studying NGV incentives competitive with other states, such as removing sales tax on the incremental cost of a natural gas vehicle or providing NGV vouchers and  
  • extending the weight limits an additional 2,000 pounds for heavy-duty HGVs using either CNG or LNG. |
| Advanced Energy Technology Development                   | The New Mexico Energy, Minerals, and Natural Resources Department administers the Clean Energy Grants Program, which provides grants for projects using clean energy technologies, including alternative fuel vehicles and fueling infrastructure, as well as projects that provide clean energy education, technical assistance, and training programs. These grants are provided on a competitive basis to qualifying entities such as municipalities and county governments, state agencies, state universities, public schools, post-secondary educational institutions, and Indian nations, tribes, and pueblos. Funding for this program is currently not available |
| Alternative Fuel Tax Exemption                           | Alternative fuel distributed by or used for U.S. government, state government, or Indian nation, tribe, or pueblo purposes is exempt from the state excise tax. |
| Alternative Fuel Vehicle (AFV) Acquisition               | A minimum of 75% of state government and educational institution fleet vehicles purchased must: meet or exceed United States department of transportation corporate average fuel economy standards; be electric; be hybrid-electric; or operate on alternative fuel. Certified law enforcement pursuit vehicles and emergency vehicles are exempt from this requirement. The New Mexico Energy, Minerals and Natural Resources Department may |
grant additional exemptions based on the availability and suitability of vehicles, as well as fuel availability and cost. Up to $5 million is authorized for a revolving loan fund for AFV acquisitions by state agencies, political subdivisions, and educational institutions. The maximum amount of a loan per vehicle must not exceed the actual cost of acquiring the vehicle or $3,000, whichever is less. Projected fuel cost savings from using the AFV is considered when the loan repayment schedule is developed.

Alternative Fuel Definition
Alternative fuels are defined as natural gas, liquefied petroleum gas, electricity, hydrogen, fuel mixtures containing not less than 85% ethanol or methanol, and fuel mixtures containing not less than 20% vegetable oil, or a water-phased hydrocarbon fuel emulsion in an amount not less than 20% by volume. Biodiesel is defined as a renewable, biodegradable, mono alkyl ester combustible liquid fuel that is derived from agricultural plant oils or animal fats and meets current ASTM biodiesel standards.

Alternative Fuels Tax
Alternative fuels subject to the New Mexico excise tax include liquefied petroleum gas (propane), compressed natural gas (CNG), and liquefied natural gas (LNG). The excise tax imposed on propane is $0.12 per gallon, and the excise tax imposed on CNG and LNG is $0.133 and $0.206 per gallon, respectively. A gallon is measured as 3.785 liters of propane, 5.66 pounds (lbs.) of CNG, and 6.06 lbs. of LNG. Alternative fuel purchased for distribution is not subject to the excise tax at the time of purchase or acquisition, but the tax is due on any alternative fuel at the time it is dispensed or delivered into the tank of a motor vehicle. Alternative fuel distributors must be licensed by the state.

Alternative Fuel Tax Definition and Payment
Changed the definition of “alternative fuels” in New Mexico’s Alternative Fuels Act to include an energy equivalence formula for compressed and liquefied natural gas and eliminated the option to pay the alternative fuel excise tax on an annual basis.

Natural Gas Vehicle Definition
Defines “natural gas vehicle”. This definition is use in the Motor Vehicle Code. Establishes a gross weight exemption for natural gas vehicle, and tasks the Department of Motor Vehicles to develop and adopt regulations establishing standard weight limits for the wheels of any one vehicle axle and one wheel that allow for the gross weight limitation increases for natural gas vehicles.

Colorado
Colorado currently has several different programs to promote the use of alternative fueled vehicles. The Table 5 below lists Colorado’s current state laws and programs that incentivize and promote the use of natural gas vehicles and development of vehicle fueling infrastructure.

<table>
<thead>
<tr>
<th>Laws/Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Fleet Purchase and Pricing Agreement Requirements</td>
<td>The Colorado state fleet and the Colorado Department of Transportation (CDOT) must purchase NGVs where natural gas fueling is available or planned, whenever possible. Where NGVs are not viable options, other AFVs such as plug-in electric, hybrid electric, and propane vehicles, must be considered. All new vehicles purchased must be either alternatively fueled or exceed federal Corporate Average Fuel Economy standards.</td>
</tr>
</tbody>
</table>
Inter-Agency Fleet Improvement Coordination

CDOT, Department of Public Health and Environment, and Department of Personnel and Administration (DPA) will establish a State Fleet Sub-Council (Sub-Council) to help develop, implement, and improve programs, plans, and policies that save money, reduce emissions, promote domestic fuel use, and conserve natural resources.

Alternative Fuel Tax Credit

Alternative fuel vehicles titled and registered in Colorado are eligible for a tax credit. For the purpose of the credit, alternative fuel vehicles include new dedicated or bi-fuel natural gas, propane, electric and hydrogen vehicles that are purchased or leased. The tax credit is based on the type or weight of the vehicle as follows: light duty passenger - $5000 purchase or conversion/$2500 lease; light duty truck - $7000/$3500; medium duty truck - $10,000/$5000; heavy duty truck - $20,000/$10,000. A purchaser may assign the tax credit generated through the purchase, lease or conversion to the financing entity, allowing the purchaser to realize the value of the tax credit at the time of purchase, lease or conversion.

Natural Gas fueling Station Air Quality Permit Exempt

Natural gas fueling stations are exempt from the requirement to file Air Pollutant Emission Notices, as they have a negligible impact on air quality.

Compressed Natural Gas School Bus Matching Grants

Noble Energy is partnering with the Regional Air Quality Council (RAQC) to match grants to qualified Colorado school districts to fund CNG school bus purchases. School districts must apply to RAQC for an ALT Fuels Colorado program grant. Noble Energy will provide additional funds directly to the school district once RAQC approves the grant award. For more information, including additional requirements,

Alternative Fuel Vehicles and Infrastructure Grant Program

The Colorado Energy Office (CEO), RAQC, and CDOT, have partnered to provide grants through the ALT Fuels Colorado program for new, publicly accessible CNG fueling equipment; co-located electric vehicle charging and propane station equipment at funded CNG stations; and CNG, propane, and electric vehicles. CEO will administer the station grants to advance infrastructure development along major state-wide transportation corridors. RAQC will administer the vehicle grants for fleets operating within counties with air quality nonattainment and maintenance areas. The grant allows for up to 50% of the cost of a station (capped at $500,000) and up to 80% of the incremental costs of a vehicle.

Utah

Utah has for many years promoted the use of alternative fueled vehicles and the development of fueling infrastructure in the state. Utah is one of the top 5 states in the U.S. for natural gas fueling stations. The state’s programs promoting the use of natural gas vehicles and development of fueling infrastructure range from tax credits to grants and loans.

Table 6: Utah State Laws and Programs for NGVs

<table>
<thead>
<tr>
<th>Laws/Programs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Fuel and Vehicle Acquisition Requirement</td>
<td>By August 30, 2018, at least 50% of new or replacement light-duty state agency vehicles must meet Bin 2 emissions standards established in Title 40 of the U.S. Code of Federal Regulations, or</td>
</tr>
</tbody>
</table>
be propelled to a significant extent by electricity, natural gas, propane, hydrogen, or biodiesel.

| Alternative Fuel Vehicle (AFV) Conversion Promotion | An inter-local entity composed of members from state and local government, school and transit districts, and the private sector may be created to promote the conversion of AFVs and to encourage the construction, operation, and maintenance of facilities for AFVs. The inter-local entity may contribute funding for an AFV facility so long as the entity uses or benefits from the facility. It must also work with the Utah Public Service Commission (Commission) to explore options and opportunities to facilitate AFV conversions and promote the enhancement and expansion of infrastructure and facilities for AFVs throughout Utah. |
| Provision for Establishment of Alternative Fuel Use Mandate | The Utah Air Quality Board may require fleets that own 10 or more vehicles capable of being fueled at a central location to use clean fuels if such a mandate is necessary to meet national air quality standards. Clean fuels are defined as propane, compressed natural gas, and electricity. Additional restrictions apply. |
| Natural Gas Rate and Cost Recovery Authorization | The Commission may allow a gas corporation to set a natural gas vehicle fuel rate that is less than full cost of service if it is reasonable and in the interest of the public. If the Commission approves such a request, the remaining costs may be spread to other customers of the gas corporation. The Commission may also allow a gas corporation to recover expenditures directly related to the construction, operation, and maintenance of natural gas fueling stations and related facilities through an incremental surcharge to all of its rate classes. |
| Alternative Fuel Vehicle and Fueling Infrastructure | The Utah Clean Fuels and Vehicle Technology Grant and Loan Program, funded through the Clean Fuels and Vehicle Technology Fund, provides grants and loans to assist businesses and government entities to include:  
  - The incremental cost of purchasing original equipment manufactured clean fuel vehicles, and  
  - The cost of fueling equipment for public/private sector business and government vehicles (grants require federal and non-federal matching funds). The Utah Conversion to Alternate Fuel Grant Program, also funded through the Clean Fuels and Vehicle Technology fund, provides grants to individuals who install conversion equipment on eligible vehicles. Grants are available for 50% the cost of conversion, up to $2,500. |
| Alternative Fuel and Fuel-Efficient Vehicle Tax Credit | Through 2017, new electric, natural gas, and propane vehicles registered in Utah are eligible for an income tax credit of 35% of the vehicle purchase price, up to $1,500. Plug-in hybrid electric vehicles will be eligible for a tax credit of $1,000. Leased electric, natural gas, and propane vehicles are eligible for a tax credit on a prorated basis up to $1,500. Leased plug-in hybrid electric vehicles will be eligible for a prorated tax credit up to $1,000. For additional information, including eligible vehicles and restrictions, |
| Heavy-Duty Natural Gas Vehicle Tax Credit | Qualified taxpayers are eligible for a tax credit for the purchase of a qualified heavy-duty NGV. Each qualified heavy-duty NGV is eligible for the following tax credit amount for 2015-2017: $25,000.00. At least 50% of the qualified vehicle's miles must be driven in the state. A single taxpayer may not claim credits for more than 10 NGVs annually. If more than 30% of the total available tax credits in a single year have not been claimed by May |
1, a taxpayer may apply for credits on an additional eight NGVs. Up to 25% of the tax credits are reserved for taxpayers with small fleets of less than 40 vehicles.

### Alternative Fuel Tax Exemption
Propane, natural gas, electricity, and hydrogen, also known as special fuel, used to operate motor vehicles are exempt from state fuel taxes, but subject to a special fuel tax at the rate of three-nineteenth of the conventional motor fuel tax. A reduction in special fuel tax is permissible if the fuel is already taxed by the Navajo Nation. Retailers, wholesalers, and suppliers of special fuel are eligible for a refund of the special fuel tax if dyed diesel fuel is mixed with special fuel and the mixed special fuel is returned to the refinery.

### Texas
Like New Mexico, Texas has a rich history with the development and extraction of oil and gas. To further benefit the production and sales of natural gas, Texas has implemented several laws and programs to promote the use of domestically produced natural gas. This promotion provides the state with additional revenues through increased sales of natural gas for the transportation sector. The table below outlines the laws and programs that are currently in place in Texas.

| Table 7: Texas State Laws and Programs for NGVs |
|--------------------------------------------------|---------------------------------------------------------------|
| **Laws/Programs**                               | **Description**                                               |
| Alternative Fuel Use and Vehicle Acquisition Requirements | State agency fleets with more than 15 vehicles, excluding emergency and law enforcement vehicles, may not purchase or lease a motor vehicle unless the vehicle uses compressed or liquefied natural gas, propane, ethanol or fuel blends of at least 85% ethanol (E85), methanol or fuel blends of at least 85% methanol (M85), biodiesel or fuel blends of at least 20% biodiesel (B20), or electricity (including plug-in hybrid electric vehicles). Covered state agency fleets must consist of at least 50% of vehicles that are able to operate on alternative fuels and use these fuels at least 80% of the time the vehicles are driven. Covered state agencies may meet these requirements through the purchase of new vehicles or the conversion of existing vehicles. |
| Alternative Fueling Infrastructure Grants       | The Texas Commission on Environmental Quality (TCEQ) administers the Alternative Fueling Facilities Program (AFFP) as part of the Texas Emissions Reduction Plan. AFFP provides grants for 50% of eligible costs, up to $600,000, to construct, reconstruct, or acquire a facility to store, compress, or dispense alternative fuels in Texas air quality nonattainment areas. Qualified alternative fuels include biodiesel, electricity, natural gas, hydrogen, propane, and M85 fuel. The entity receiving the grant must agree to make the fueling station available to people and organizations not associated with the grantee during certain times. |
| Clean School Bus Program                        | Any school district or charter school may receive a grant through the TCEQ to pay for the incremental costs to install diesel oxidation catalysts, diesel particulate filters, emission-reducing add-on equipment, and other emissions reduction technologies in qualified school buses. Furthermore, funds may also be used to purchase qualifying fuels, including any liquid or gaseous fuel or additive registered or verified by the EPA (other than standard gasoline or diesel) that provides particulate matter emission reductions. |
Clean Vehicle and Infrastructure Grants

The TCEQ administers the Emissions Reduction Incentive Grants (ERIG) Program as part of the Texas Emissions Reduction Plan. The ERIG Program provides grants for various types of clean air projects to improve air quality in the state's nonattainment areas. Eligible projects include those that involve replacement, retrofit, repower, or lease or purchase of new heavy-duty vehicles; alternative fuel dispensing infrastructure; idle reduction and electrification infrastructure; and alternative fuel use.

Natural Gas Vehicle (NGV) and fueling Infrastructure Grants

The TCEQ administers the NGV Grant Program (Program) as part of the Texas Emissions Reduction Plan. The Program provides grants to replace existing medium- and heavy-duty vehicles with new, converted, or repowered NGVs. Qualifying vehicles must be on-road vehicles with a gross vehicle weight rating of more than 8,500 pounds and must be certified to current federal emissions standards. Grant funds may cover only the incremental costs. To ensure that NGVs have access to natural gas fueling infrastructure, TCEQ may also award grants through the Clean Transportation Triangle Program to support the development of a network of natural gas fueling stations along the interstate highways connecting Houston, San Antonio, Dallas, and Forth Worth.

Clean Fleet Grants

The TCEQ administers the Texas Clean Fleet Program (TCFP) as part of the Texas Emissions Reduction Plan. TCFP encourages owners of fleets containing diesel vehicles to permanently remove the vehicles from the road and replace them with AFVs or hybrid electric vehicles. Grants are available to fleets to offset the incremental cost of such replacement projects. An entity that operates a fleet of at least 75 vehicles, including at least 20 diesel-powered vehicles, and that commits to placing 20 or more qualifying vehicles in service for use entirely in Texas during a given calendar year may be eligible. Qualifying AFV or hybrid electric vehicle replacements must reduce emissions of nitrogen oxides or other pollutants by at least 25% as compared to baseline levels and must replace vehicles that meet operational and fuel usage requirements.

Clean Vehicle Replacement Vouchers

The Texas Commission on Environmental Quality administers the Air-Check Texas Drive a Clean Machine program, which provides vehicle replacement assistance for qualified individuals owning vehicles registered in participating counties. Vouchers in the amount of $3,500 are available toward the purchase of a hybrid electric, battery electric, or natural gas vehicle that is up to three model years old.

* Natural Gas Vehicle (NGV) and Fueling Infrastructure Rebates – Texas Gas Service

The Texas Gas Service Conservation Program offers a rebate of up to $2,000 for the purchase of a qualified NGV or $3,000 for the conversion of a gasoline powered vehicle to operate on natural gas. The rebate is available for up to five vehicles per customer, and only centers certified by the Railroad Commission of Texas may perform conversions. A rebate of $1,000 is also available for the purchase of a natural gas forklift. Additionally, qualified residential and commercial NGV fueling infrastructure may be eligible for a rebate of up to $1,500.

Oklahoma

Oklahoma is another extensive producer of oil and gas in the United States. To promote the use of domestically produced natural gas, Oklahoma has adopted several programs and laws. The
Table 8: Oklahoma State Laws and Programs for NGVs

<table>
<thead>
<tr>
<th>Laws/Programs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas Vehicle (NGV) Loan Program Development</td>
<td>The Oklahoma Cooperative Circuit Engineering Districts Board must develop and adopt rules and processes for a no-interest loan program to allow qualified county governments to purchase or convert NGVs. Counties that borrow funds must sell to a nongovernmental entity or properly dispose of a comparable number of conventional vehicles. Loan terms will be up to five years.</td>
</tr>
<tr>
<td>Alternative Fuel Vehicle (AFV) Acquisition Requirements</td>
<td>All school and government fleets may convert their vehicles to operate on alternative fuels, and all school districts should consider purchasing only vehicles able to operate on alternative fuels. School and government vehicles capable of operating on an alternative fuel must use the fuel whenever a fueling station is located within a five-mile radius of the respective school district or government department and the price of the alternative fuel is cost competitive with the displaced conventional fuel. If school and government vehicles must be fueled outside the five-mile radius and no fueling station is reasonably available, the school and government vehicles are exempt from this requirement.</td>
</tr>
<tr>
<td>Alternative Fuel School Bus Conversion Research</td>
<td>The School Transportation Task Force (Task Force) must investigate the costs and benefits of converting school buses and bus fleets to compressed natural gas or another alternative fuel system. The Task Force must make recommendations to the governor and legislature regarding the research findings.</td>
</tr>
<tr>
<td>Compressed Natural Gas (CNG) Fueling Infrastructure Development</td>
<td>The Oklahoma Legislature intends to increase the amount of CNG fueling infrastructure in the state, with the overall goal of having one public fueling station located every 100 miles along the interstate highway system by 2015 and one public fueling station every 50 miles by 2025. The Oklahoma Office of Management and Enterprise Services Fleet Management Division may partner with private entities to build CNG fueling infrastructure.</td>
</tr>
<tr>
<td>Alternative Fuel Vehicle (AFV) Tax Credit</td>
<td>For tax years beginning before January 1, 2020, a one-time income tax credit is available for 45% of the incremental cost of purchasing a new original equipment manufacturer AFV, excluding electric vehicles, or converting a vehicle to operate on an alternative fuel. The state also provides a tax credit in the amount of 10% of the total vehicle cost, up to $1,500, if the incremental cost of a new AFV cannot be determined or when an AFV is resold, as long as a tax credit has not been previously taken on the vehicle.</td>
</tr>
<tr>
<td>Alternative Fueling Infrastructure Tax Credit</td>
<td>For tax years beginning before January 1, 2020, a tax credit is available for up to 75% of the cost of installing commercial alternative fueling infrastructure. Eligible alternative fuels include natural gas, propane, and electricity. The infrastructure must be new and must not have been previously installed or used to fuel alternative fuel vehicles. A tax credit is also available for up to 50% of the cost of installing a residential compressed natural gas fueling system, up to $2,500.</td>
</tr>
<tr>
<td><strong>Natural Gas Vehicle Loans – Communication Federal Credit Union (CFCU)</strong></td>
<td>CFCU offers loans to individuals and businesses that purchase new or converted CNG vehicles. Conversion systems must be certified by the U.S. Environmental Protection Agency and installed by an insured and state-licensed facility. New vehicle loans are available at amounts up to the manufacturer’s suggested retail price plus the cost of the conversion. Pre-owned or CFCU member-owned vehicles with a CNG fuel system or conversion installation are eligible for loans at up to 115% of the National Automobile Dealers Association suggested retail value. All financing is at CFCU standard auto loan rates. CFCU also offers loans for the cost of home fueling appliances.</td>
</tr>
<tr>
<td><strong>Compressed Natural Gas (CNG) Vehicle Conversion Loans – Allegiance Credit Union</strong></td>
<td>The Allegiance Credit Union offers low-cost loans to customers for CNG vehicle conversions.</td>
</tr>
</tbody>
</table>

*Utility/Private Incentive*
Potential Federal Funding

There are presently many different federal incentives that support the development and deployment of alternatives fuels and engines in transportation. These incentives include tax deductions and credits for vehicle purchases and the installation of refueling systems, federal grants for conversion of older vehicles to newer technologies, and incentives for manufacturers to produce alternative fuel vehicles. The purposes of these incentives are to reduce petroleum consumption and import dependence, improving environmental quality, and expanding domestic manufacturing. Although these federal incentives exist, the incentives are utilized on a very limited basis for the development and deployment of natural gas vehicles and infrastructure. Other alternative fuels, such as electric, currently have more substantial federal incentives.

Some of the federal incentives available for natural gas vehicles are listed below:

- The FHWA: Congestion Mitigation and Air Quality Improvement Program (CMAQ);
- The EPA: Diesel Emission Reduction Act Funding (DERA);
- The DOE: Improved Energy Technology Loans, State Energy Program Funding and Energy Efficiency and Renewable Energy Grants; and

Federal Highway Administration

One of the major air quality related funding opportunities currently available to states is through the FHWA’s Congestion Mitigation and Air Quality Improvement Program. The CMAQ Improvement Program provides funding to state departments of transportation (DOTs), municipal planning organizations (MPOs), and transit agencies for projects and programs in areas that have violated one or more the National Ambient Air Quality Standards (NAAQS) or what is referred to as a nonattainment (currently in violation) or maintenance (reclassification for an area with three (3) years of clean air quality data) area. The purpose of the CMAQ funding is to reduce transportation-related emissions. New Mexico currently has one official nonattainment area. The area is nonattainment for particulate matter 10 microns in size and less (PM10) and is located in Anthony, New Mexico. There is also one limited maintenance area with in the state. This area is in maintenance for sulfur dioxide and is located in Grant County, NM. The Sunland Park/Santa Teresa area of the state has monitored air quality violations for the 2015 ozone NAAQS, but has not been officially designated as a nonattainment area at this time. Official designations from EPA for the 2015 ozone NAAQS are expected in October of 2017.

Eligible activities include transit improvements, travel demand management strategies, traffic flow improvements, purchasing idle reduction equipment, development of alternative fueling infrastructure, conversion of public fleet vehicles to operate on cleaner fuels such as natural gas, and outreach activities that provide assistance to diesel equipment and vehicle owners and operators regarding the purchase and installation of diesel retrofits or conversion to alternative fuels such as natural gas. State DOTs and MPOs must give priority to projects and programs to include diesel retrofits and other cost-effective emissions reduction activities, and cost-effective congestion mitigation activities that provide air quality benefits.
Although the main purpose of the CMAQ funding is to assist areas with air quality violations of the NAAQS, states are allowed to utilize a portion of the funding as flexible funding. These flexible funds can be used for projects outside of the state’s nonattainment and maintenance areas. Some of the past New Mexico transit projects that have utilized CMAQ funding are listed below in Table 9.

### Table 9: New Mexico CMAQ Transit Projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Location</th>
<th>Project Description</th>
<th>Amount (Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>Albuquerque</td>
<td>Right-of-way purchase, Construction of Bus Service Improvements and Development of Park and Ride Lots</td>
<td>900,000</td>
</tr>
<tr>
<td>2013</td>
<td>Sunland Park</td>
<td>Purchase or Modification of Conventionally Fueled Vehicle Bus</td>
<td>550,000</td>
</tr>
<tr>
<td>2012</td>
<td>Albuquerque</td>
<td>Operating Assistance Expanded Bus Service</td>
<td>750,000</td>
</tr>
<tr>
<td>2011</td>
<td>Sunland Park</td>
<td>Purchase or Modification of Conventionally Fueled Bus</td>
<td>400,000</td>
</tr>
<tr>
<td>2010</td>
<td>Albuquerque</td>
<td>Purchase or Modification of Conventionally Fueled Bus</td>
<td>971,939</td>
</tr>
<tr>
<td>2009</td>
<td>Albuquerque</td>
<td>Operating Assistance for Expanded Rail Service</td>
<td>380,000</td>
</tr>
<tr>
<td>2007</td>
<td>Rio Rancho</td>
<td>Transit-Project-Operating Assistance New Bus Service</td>
<td>160,000</td>
</tr>
</tbody>
</table>

Source: New Mexico Department of Transportation

**The Environmental Protection Agency**

In 2005, the U.S. Congress passed the Diesel Emission Reduction Act or DERA. The purpose of DERA is to reduce diesel emissions from existing diesel fleets that do not meet federal emission standards. The EPA is responsible over overseeing and distributing the funding associated with DERA. On the state level, DERA provides funding through the State Allocation Program that is distributed evenly among the 50 states, Washington D.C. and the U.S. Territories. The New Mexico Environment Department Air Quality Bureau (AQB) is responsible for implementing and overseeing New Mexico’s allocated funding. The funding provided to the state can be used for both private and public entities, but can only be used for eligible diesel projects. The currently eligible projects include:

- **EPA verified** retrofit technologies or certified engine configuration;
- **California Air Resources Board (CARB)** verified retrofit technologies or certified engine configuration;
- **Idle-reduction** technologies that are EPA verified;
- **Aerodynamic technologies** and **low rolling resistance tires** that are EPA verified; and
- Early engine, vehicle or equipment replacements with **certified engines configurations**.

Since 2008, the AQB has administered $847,043 worth of funding under the DERA program for diesel emission reduction projects. The grant funding has been used for the following projects:

- Bloomfield School District – School bus retrofits;
• Central Consolidated School District – School bus retrofit;
• City of Deming – Early off-road vehicle replacement;
• Farmington School District – School bus retrofits;
• Gallup/McKinley County School District – School bus retrofits;
• New Mexico Association of Food Banks – Dock outlets for trailer refrigeration units; aerodynamic fairings, and low rolling resistance tires;
• Taos County – Early vehicle replacement; and
• City of Albuquerque – Installed Auxiliary Power Units on seven (7) fleet vehicles.

Although DERA funding is primarily directed towards the use of clean diesel engines, DERA funds can also be used for the replacement of older diesel vehicles with alternative fueled vehicles, such as compressed natural gas vehicles. EPA allows the DERA funding to be used for diesel vehicle replacements with alternative fueled vehicles as long as the vehicle is powered by a 2015 model year or newer certified engine.

Department of Energy

The U.S. Department of Energy provides loan guarantees through the Loan Guarantee Program to eligible projects that reduce air pollution and greenhouse gases, and support early commercial use of advanced technologies, including biofuels and alternative fuel vehicles, including natural gas vehicles. DOE may issue loan guarantees for up to 100% of the amount of the loan for an eligible project. For loan guarantees of over 80%, the loan must be issued and funded by the Treasury Department's Federal Financing Bank.

The DOE Loan Guarantee Program was created in the Energy Policy Act of 2005 to overcome the great challenges that large nuclear, renewable, and other energy projects face in obtaining affordable long-term financing in the commercial marketplace. The DOE Loan Guarantee Program is open to both public and private entities. Since its creation, the DOE Loan Guarantee Program has closed loan guarantees for 28 energy projects and made commitments to two others, sparking private investment of more than $25 billion.

Internal Revenue Service

Alternative Fuel Tax Exemption

Alternative fuels used in a manner that the IRS deems as nontaxable are exempt from federal fuel taxes. Common nontaxable uses of a motor vehicle are: on a farm for farming purposes; in certain intercity and local buses; in a school bus; exclusive use by a non-profit educational organization; and exclusive use by a state, political subdivision of a state, or the District of Columbia. This exemption is not available to tax exempt entities that are not liable for excise taxes on transportation fuel.

Alternative Fuel Excise Tax Credit

A tax incentive is available for alternative fuel, including natural gas, that is sold for use or used as a fuel to operate a motor vehicle. A tax credit in the amount of $0.50 per gallon is available for the following alternative fuels: CNG, LNG, liquefied hydrogen, liquefied petroleum gas (propane), P-Series fuel, liquid fuel derived from coal through the Fischer-Tropsch process, and
compressed or liquefied gas derived from biomass. For propane, CNG, and LNG sold after December 31, 2015, the tax credit is based on the GGE) or DGE. For taxation purposes, one GGE is equal to 5.75 lbs. of propane and 5.66 lbs. of CNG. One DGE is equal to 6.06 lbs. of LNG.

For an entity to be eligible to claim the credit, they must be liable for reporting and paying the federal excise tax on the sale or use of the fuel in a motor vehicle. Tax exempt entities such as state and local governments that dispense qualified fuel from an on-site fueling station for use in vehicles qualify for the incentive. Eligible entities must be registered with the IRS. The incentive must first be taken as a credit against the entity's alternative fuel tax liability; any excess over this fuel tax liability may be claimed as a direct payment from the IRS. Under current law, this tax credit is applicable to fuel sold or used between January 1, 2015, and December 31, 2016. Although the current credit expires at the end of 2016, this incentive could be extended and available after 2016.

**Alternative Fuel Infrastructure Tax Credit**

The Alternative Fuel Excise Tax Credit applies to fueling equipment for natural gas, liquefied petroleum gas (propane), liquefied hydrogen, electricity, E85, or diesel fuel blends containing a minimum of 20% biodiesel. The tax credit is 30% of the fueling equipment cost for most alternative fueling infrastructure, not to exceed $30,000, for equipment installed between January 1, 2015, and December 31, 2016. The full tax credit does not apply to CNG fueling infrastructure though. The tax credit only allows for 3% of the total cost for CNG fueling infrastructure. Permitting and inspection fees are also not included in covered expenses. Fueling station owners who install qualified equipment at multiple sites are allowed to use the credit towards each location. Although the current credit expires at the end of 2016, this incentive could be extended and available after 2016.

**NGV Fuels Corridors**

One of the major factors limiting the use of natural gas for fleet and private vehicles is the lack of available infrastructure. The availability of natural gas infrastructure is one of the main drivers for the inclusion of natural gas in any fleet, large or small. To increase the use of this state resource, adequate infrastructure is critical. The states surrounding New Mexico are presently leading the charge in developing increased natural gas fueling infrastructure. These states understand that in order to reap the benefits of natural gas vehicles within their state, fueling infrastructure must be made available through-out the state or at least along major travel corridors.

**Past Legislation in New Mexico**

There have been many legislative bills introduced during New Mexico’s State Legislative Sessions over the last 15 years to incentivize the use and development of natural gas vehicles and fueling infrastructure in the state. These legislative bills are listed below. The bills in bold are those bills that passed and are currently being implemented on the state level.

- Tax Exemption for Alternative Fueled Vehicles; House Bill (HB) 741, 2001
- Alternative Fuel Tax Incentives, Senate Bill (SB) 18, 2001
• Study Alternative Fuels Infrastructure Needs; Senate Joint Memorial (SJM) 93, 2002
• **Alternative Fuel Vehicle Acquisitions; SB 18, 2002**
• Exempt Alternative Fuel Vehicles; HB 70, 2003
• Alternative Fuel Vehicles Tax Exemptions; SB 193, 2003
• **Advanced Energy Technology Development Act; HB 251, 2004**
• Lease Purchase of Alternative Fuel Vehicles; SB 580, 2009
• Natural Gas Vehicles Tax Credit; HB 282, 2010
• Require New State Vehicles to Use Natural Gas; SB 83, 2010
• Tax Credits for Natural Gas and Vehicle Fuel; HB 198, 2011
• Alternative Fuel Vehicle Tax Credits, HB 616, 2013
• **Alternative Fuel Tax Definitions and Payment; HB 30, 2014**
• Natural Gas Car Tax Deductions & Credits; HB 512 and SB 347, 2015
• **Natural Gas Vehicle Definition; HB 176, 2016**
• **Increase Natural Gas Vehicle Use; House Joint Memorial (HJM) 5, 2016**
• Utility Infrastructure Expansion Act; HB 140 and SB 213, 2016
• Clean-Burning Vehicle Fuel Tax Credit; HB 319, 2016

Of the legislative programs passed, there are currently only two incentive programs. The Clean Energy Grant Program that is administered by the New Mexico Energy, Minerals, and Natural Resources Department provides grant funding for projects using clean energy technologies. Although this program does exist, funding for the program is currently not available. The other state incentive allows for an exemption from the state excise tax for alternative fuels distributed by or used for U.S. government, state government or and Indian nation, tribe or pueblo purposes.

**FAST Act Corridor**
Section 1413 of the federal Fixing America’s Surface Transportation (FAST) Act was signed into law on December 4, 2015. The FAST act requires the Secretary of the FHWA to designate national electric vehicle charging, hydrogen, propane, and natural gas fueling corridors by December 4, 2016. In accordance with the FAST Act, corridor designations must identify near- and long-term need for, and location of, electric vehicle charging, hydrogen fueling, propane fueling, and natural gas fueling infrastructure at strategic locations along major national highways to improve mobility of passenger and commercial vehicles that employ electric, hydrogen fuel cell, propane, and natural gas fueling technologies across the United States.

The FHWA solicited nominations for corridors from state/local officials and involved a range of stakeholders. Within five years of establishing the corridors, and every five years thereafter, the federal Department of Transportation must update and re-designate the corridors. Although dedicated funding is not provided under the FAST Act for designated corridors, FHWA believes the designation of such corridors can serve important public purposes. For instance, the U.S. has pledged to reduce greenhouse gas emissions 26-28 % by 2025 and 80 % or more by 2050. The FHWA also intends to develop appropriate signage that may be placed on designated corridors in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).
**Recommendations**

Based on the many advantages of natural gas to the economy and environment in New Mexico, it would benefit the State to build a robust natural gas vehicle market. As seen in the surrounding states, there are economic and environmental drivers for the development of a natural gas vehicle market. The states surrounding New Mexico have strong NGV programs that need New Mexico’s involvement in the natural gas vehicle market to continue NGV corridors across the southern and Rocky Mountain portions of the United States. In addition to the states surrounding New Mexico, most of the southern U.S. border states are currently promoting the use of natural gas vehicles. Only Alabama and New Mexico do not currently have a state natural gas vehicle market program.

In order to launch a successful natural gas vehicle marketing campaign, it is imperative that the correct combination of incentives and policies are implemented in New Mexico. Incentives can include mandates, tax credits or rebates, a favorable natural gas fuel tax, grants and preferential CNG rates from local distribution companies, the public utility commission or both. Presently, the New Mexico Gas Company does have a preferential rate for alternative fuel users. State policies and programs could include Joint Powers Agreements (JPA) or Memorandums of Understanding (MOU) between state government departments, signage programs, and public access at all natural gas fueling facilities, including private stations.

To further ensure the success of a state-wide natural gas vehicle marketing campaign, economic impact studies should to be conducted to determine the viability of any potential incentive or policy. This type of economic analysis will assist the state in determining how natural gas vehicles fit into the overall alternative fuels market for the state.

**Mandates**

Fleet vehicle procurement requirements are common in states implementing a successful natural gas vehicle program. As seen above in Tables 5-8, Colorado, Utah, Texas and Oklahoma all have state mandates for the purchase and utilization of alternative fueled vehicles that exceed the requirements of the federal Energy Policy Act of 1992 (EPAct) for the acquisition and utilization of alternative fueled vehicles, such as natural gas vehicles. The State of New Mexico has a similar mandate under the Alternative Fuel Acquisition Act [13-1b-1 NMSA 1978], but only mandates the minimum requirements of EPAct.

Any mandate that is put in place requires rigor in enforcing its policies. Mandates require the use of incentives (good and bad) to ensure that required levels of usage are achieved.

**Tax Incentives**

State tax credits or rebates are available in many states, including the states surrounding New Mexico, for the cost of alternative fuel vehicle fueling infrastructure or the incremental cost of the conversion or additional cost to purchase a natural gas vehicle. It is important to incentivize both the alternative vehicle fueling infrastructure and incremental costs for vehicle conversions. In states where tax credits have been effective, the tax credit is normally at least 50% of the incremental cost of a vehicle or 50% of the cost of a fueling station.
Favorable Natural Gas Fuel Exemptions
Some states offer an exemption of state sales, use taxes and permit requirements for compressed or liquefied natural gas that is used exclusively to operate a motor vehicle engine. The State of Colorado allows natural gas fueling stations to be exempt from the requirement to file Air Pollutant Emission Notices due to the fact that the fueling stations have a negligible impact on air quality. The State of Arizona does not charge state highway excise taxes for alternative fuel vehicles.

Grant and Loan Programs
Many states have established grant and loan programs for natural gas vehicles and infrastructure that provide an attractive incentive for companies, individuals or both. Often there are matching dollar requirements for such grants that can be provided by producers, local distribution companies, private industry, government entities and other interested parties. Texas and Oklahoma have also established private loan programs for the development of natural gas fueling infrastructure, the purchase of natural gas vehicles and CNG vehicle conversations.

Grant programs that cover most, if not all, of the incremental cost of a natural gas vehicle have proven to be the most successful type of incentive program to increase a state’s NGV market. These type of grant programs allow the funding to be available to consumers at the time the vehicle is purchased. The State of Colorado currently has this type of incentive program (See Table 5). Colorado’s Alternative Fuel Vehicles and Infrastructure Grant Program offers grants for NGVs and stations and provides tax credits for the purchase of natural gas vehicles. The Alternative Fuel Vehicles and Infrastructure Grant Program can be combined with the tax credit, which combined together can cover most of the incremental cost for a natural gas vehicle. These two incentive programs have doubled the number of fueling stations and NGVs in Colorado over the past two and a half years.

Policy Recommendations for the State of New Mexico
In addition to the traditional methods for the promotion and incentivizing the use of natural gas for transportation, there are other actions and policies that can aid the growth of the NGV market in New Mexico. Below is a list of potential policies that could also be implemented on the state level to increase the use and assist in providing a more robust data set on natural gas vehicles and infrastructure in the state.

- A Joint Powers Agreement (JPA) between the New Mexico Energy, Minerals and Natural Resources Department and the State Motor Vehicle Department (MVD) regarding the updating of MVD’s data base on a regular basis. In particular, alternative fuel vehicle information would be corrected and updated systematically with comparisons being done on an annual basis concerning changes in the data base. Correct alternative fuel data along with vehicle registration and location would be primary data points to be tracked.
- Create a state wide alternative fuel highway signage program to identify communities and exits adjacent to interstates where alternative fuels are available.
• Mandate the use of alternative fuel shuttle buses and vans serving the Albuquerque International Airport and create a long-term policy supporting their expanded use both inside and outside the airport terminal.

• Require all natural gas fueling stations that receive public or incentive funding or tax credits to provide public access regardless of where the station is located and who operates it.

• Create a vehicle registration program for natural gas vehicles and aftermarket conversions of gasoline and diesel vehicles to natural gas. Register the 16 digit vehicle identification number (VIN) in 16 separate columns to allow the database to be searchable for natural gas vehicles.

• Create legislative mandates that pass the cost savings of avoided groundwater contamination and oil and gasoline remediation spills costs onto alternative fuel users in the form of lower insurance costs.

• Legislatively mandate a 50 cent per registered vehicle annual charge to create an alternative fuel vehicle fund that can be used to help defer some of the cost of conversion to alternative fuels. Mandate that the fund not revert to the General Fund at the end of each year, but be allowed to stay in place for use in future years if not used completely at the end of each fiscal year. Guarantee that the fund not be used for any other purposes other than alternative fuel vehicle conversions. The New Mexico Energy, Minerals, and Natural Resources Department could administer these funds through their statutorily mandated alternative fuels program.

• Incorporate the expanded use of alternative fuels in all air quality plans within the state.

• Create a state-wide outreach and education program on the benefits of natural gas vehicles. Use the outreach material to promote the use of natural gas vehicles and educate communities and their leaders on the benefits of natural gas vehicles.

**Barriers and Barrier Removal**

The cost of natural gas fueling infrastructure is one of the major barriers in increasing the interest and utilization of natural gas vehicles for public and private fleets in New Mexico. The limited availability of natural gas fueling stations throughout state makes it difficult to effectively promote the use of natural gas vehicles. As Figure 8 shows, there are natural gas fueling stations along the Interstate 25 corridor, but none outside of the Albuquerque Metro area along Interstate 40. Limited fueling accessibility is a barrier that many states have dealt with. To increase the number of fueling stations, many states have developed grant and incentive programs similar to the programs developed by the States of Oklahoma, Texas and Colorado. Through this increase in fueling infrastructure, states are seeing an increase in the number of natural gas fleet conversions in both the private and public sectors. New Mexico House Bill (HB) 319, which was introduced but not adopted during the 2016 Legislative Session, is a good example of this type of tax incentive to promote the development of natural gas fueling stations within the state. HB319 proposed an income tax credit for clean-burning motor vehicle equipment. HB 319 allowed for up to a $500,000.00 tax credit for the taxable years that a qualified clean-burning motor vehicle equipment or fueling infrastructure is installed.
Another barrier in the use of natural gas vehicles is the lack of state mandates requiring the increase use of alternative fueled vehicles on the state level. As stated earlier, New Mexico’s Alternative Fuel Acquisition Act mandates the minimum federal requirement for the acquisition of alternative fueled vehicles on the state level. States such as Texas, Colorado and Utah have mandates that exceed the federal requirements for the acquisition of alternative fueled vehicles. States that have implemented more stringent requirements for the acquisition of alternative fueled vehicles have found that the increased use in the public sector also increases awareness and interest of alternative fueled vehicles in the private sector.

**Conclusion**

To increase natural gas fueling station infrastructure and vehicle use in New Mexico will require that the state develop a proactive alternative fuels program. As shown in this report, those states that have increased the use of alternative fueled vehicles have done so through the use of grants, incentives and mandates. By developing similar incentive programs on the state level, New Mexico would not only be utilizing a domestically produced fuel that provides revenue for state and its residents, but would also be protecting the health and quality of air for the citizens of New Mexico.