



**CALIFORNIA
ENERGY COMMISSION**



**CALIFORNIA
NATURAL
RESOURCES
AGENCY**

Clean Transportation Program

FINAL PROJECT REPORT

Upgrade and Expand Existing Compressed Natural Gas Station for Walnut Valley Unified School District

Prepared for: California Energy Commission

Prepared by: Walnut Valley Unified School District



March 2023 | CEC-600-2023-023

California Energy Commission

Samantha Horton
Primary Author

Walnut Valley Unified School District
880 S. Lemon Avenue
Walnut, CA 91789
(909) 595-1261
[Walnut Valley Unified Website](http://www.wvusd.org) (www.wvusd.org)

Agreement Number: ARV-12-040

Thanh Lopez
Commission Agreement Manager

Mark Wenzel
Branch Manager
Light-Duty Electric Vehicle Infrastructure and Analysis Branch

Hannon Rasool
Director
FUELS AND TRANSPORTATION

Drew Bohan
Executive Director

DISCLAIMER

This report was prepared as the result of work sponsored by the California Energy Commission (CEC). It does not necessarily represent the views of the CEC, its employees, or the State of California. The CEC, the State of California, its employees, contractors, and subcontractors make no warrant, express or implied, and assume no legal liability for the information in this report; nor does any party represent that the use of this information will not infringe upon privately owned rights. This report has not been approved or disapproved by the CEC nor has the CEC passed upon the accuracy or adequacy of the information in this report.

ACKNOWLEDGEMENTS

This project consumed huge amount of work, collaboration, and dedication. Implementation of the project would not have been possible without the support and dedication of the individuals and organizations listed below. Walnut Valley Unified School District would like to extend their gratitude to the following:

- Samantha Horton, Walnut Valley Unified School District
- Samuel Sornoso, Walnut Valley Unified School District
- Celia Moynihan, Walnut Valley Unified School District
- Suzanne Beach, Walnut Valley Unified School District
- Jeffrey Roule, Roule Construction Inc.
- Ron Smith, Adrianus Resources, Inc.
- Timothy E. Nelligan, P.E., Go Natural Gas
- Robert G. Martinez, P.E., PLS ON-LINE Engineering
- Southern California Gas
- Fueling and Service Technologies, Inc. dba Fastech
- Compressor Design and Services, Inc.

PREFACE

Assembly Bill 118 (Núñez, Chapter 750, Statutes of 2007) created the Clean Transportation Program. The statute authorizes the California Energy Commission (CEC) to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies. Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) reauthorizes the Clean Transportation Program through January 1, 2024, and specifies that the CEC allocate up to \$20 million per year (or up to 20 percent of each fiscal year's funds) in funding for hydrogen station development until at least 100 stations are operational.

The Clean Transportation Program has an annual budget of about \$100 million and provides financial support for projects that:

- Reduce California's use and dependence on petroleum transportation fuels and increase the use of alternative and renewable fuels and advanced vehicle technologies.
- Produce sustainable alternative and renewable low-carbon fuels in California.
- Expand alternative fueling infrastructure and fueling stations.
- Improve the efficiency, performance, and market viability of alternative light-, medium-, and heavy-duty vehicle technologies.
- Retrofit medium- and heavy-duty on-road and nonroad vehicle fleets to alternative technologies or fuel use.
- Expand the alternative fueling infrastructure available to existing fleets, public transit, and transportation corridors.
- Establish workforce-training programs and conduct public outreach on the benefits of alternative transportation fuels and vehicle technologies.

To be eligible for funding under the Clean Transportation Program, a project must be consistent with the CEC's annual Clean Transportation Program Investment Plan Update. The CEC issued PON-11-602 to provide funding for projects which develop infrastructure necessary to store, distribute, and dispense electricity, E-85, propane, diesel substitutes, and natural gas. In response to PON-11-602, the recipient submitted an application which was proposed for funding in the CEC's notice of proposed awards April 24, 2012 and the agreement was executed as ARV-12-040 on May 31, 2013.

ABSTRACT

Walnut Valley Unified School District upgraded their existing compressed natural gas fueling station that was originally installed in 1990. The original station consisted of two compressors, which were out of service for over five years. Seven of the dual time fueling posts restricted the school district's ability to accommodate daily fueling of their fleet of 21 natural gas busses. The new station installed now consists of a dual skid-mounted compressor system complete with time-fill system controls, a communication panel, and eight additional dual-time fill posts. The school district has replaced three diesel school buses, which now brings the fleet to a total of 24 natural gas busses. Walnut Valley Unified School District plans to continue to replace their remaining fleet of seven diesel busses with natural gas busses.

Keywords: Walnut Valley Unified School District, compressed natural gas, CNG fueling station, natural gas infrastructure, natural gas bus fleets

Horton, Samantha. Walnut Valley Unified School District. 2023. *Upgrade and Expand Existing Compressed Natural Gas Station for Walnut Valley Unified School District*. California Energy Commission. Publication Number: CEC-600-2023-023.

TABLE OF CONTENTS

	Page
Acknowledgements	i
Preface.....	ii
Abstract	iii
Table of Contents.....	v
List of Figures	vi
List of Tables	vi
Executive Summary.....	1
CHAPTER 1: Introduction	3
Background	3
Initial Situation.....	5
Project Objective.....	5
CHAPTER 2: Project Approach	6
Utility Service Upgrade	6
System Design and Specifications.....	6
Project Equipment.....	7
Site Preparation, Construction and Installation	8
Commissioning.....	12
Training.....	12
Subcontractors for Project	12
CHAPTER 3: Data Collection and Analysis	14
Data Collection Plan	14
Data Collection.....	14
Analysis	15
Proposed Results versus Actual Results	15
CHAPTER 4: Project Outcome	16
Observations and Conclusions.....	16
Recommendations.....	17
GLOSSARY.....	18

LIST OF FIGURES

	Page
Figure 1: Walnut Valley Unified School District Education Center	3
Figure 2: Map of Walnut Valley Unified School District.....	4
Figure 3: CNG Station Demolition.....	9
Figure 4: Trenching for Time-Fill Post Assemblies.....	9
Figure 5: Equipment Installation	10
Figure 6: New Compressors.....	10
Figure 7: Time-Fill Post Assembly.....	11
Figure 8: Installed Time-Fill Post Assembly	11
Figure 9: Walnut Valley USD Bus Fleet	16

LIST OF TABLES

	Page
Table 1: Equipment List.....	8
Table 2: Subcontractors for the Project	12
Table 3: Six Months of Data Collection	14

EXECUTIVE SUMMARY

The objective of the Walnut Valley Unified School District compressed natural gas fueling station upgrade project was to upgrade an existing compressed natural gas fueling station that can meet the current and future compressed natural gas fueling needs of the school district.

Walnut Valley Unified School District has been successful in receiving South Coast Air Quality Management District grant funding for new natural gas buses. The school district was successful in procuring an additional three natural gas buses after the start of the CNG station upgrade project and intends to expand its fleet to a total of 28 natural gas buses replacing its diesel fleet.

With CEC funding, Walnut Valley Unified School District was able to move forward immediately with the upgrade of the compressed natural gas fueling station project.

Tim Nelligen of Go Natural Gas was contracted by Walnut Valley Unified School District to be the lead consultant for the design, construction management of the compressed natural gas fueling station. The design process started in May 2015 and the construction of the fueling station was completed in early July 2016. Construction was completed through Fueling and Service Technologies, Inc. dba Fastech. The compressed natural gas fueling station was built with eight fueling posts, natural gas dryer, and new compressors allowing the school district to fuel their 24 natural gas school buses and anticipate the growth of their natural gas bus fleet. Growth of the natural gas bus fleet will be dependent on available grants.

Since the completion of the compressed natural gas fueling station, Walnut Valley Unified School district has seen a substantial reduction in the use of diesel fuel. It has also enabled the school district to use compressed natural gas school buses on field trips, furthering the reduction of the use of diesel fuel.

CHAPTER 1: Introduction

Background

Walnut Valley Unified School District (WVUSD) is in Los Angeles County in the southeast corner of the San Gabriel Valley and encompasses portions of the cities of Walnut, Diamond Bar and West Covina. The school district, pictured in Figure 1 and 2 below, serves approximately 14,600 students at its fifteen schools: nine elementary, three middle schools, two high schools, one continuation high school, and an alternative education program.

Figure 1: Walnut Valley Unified School District Education Center

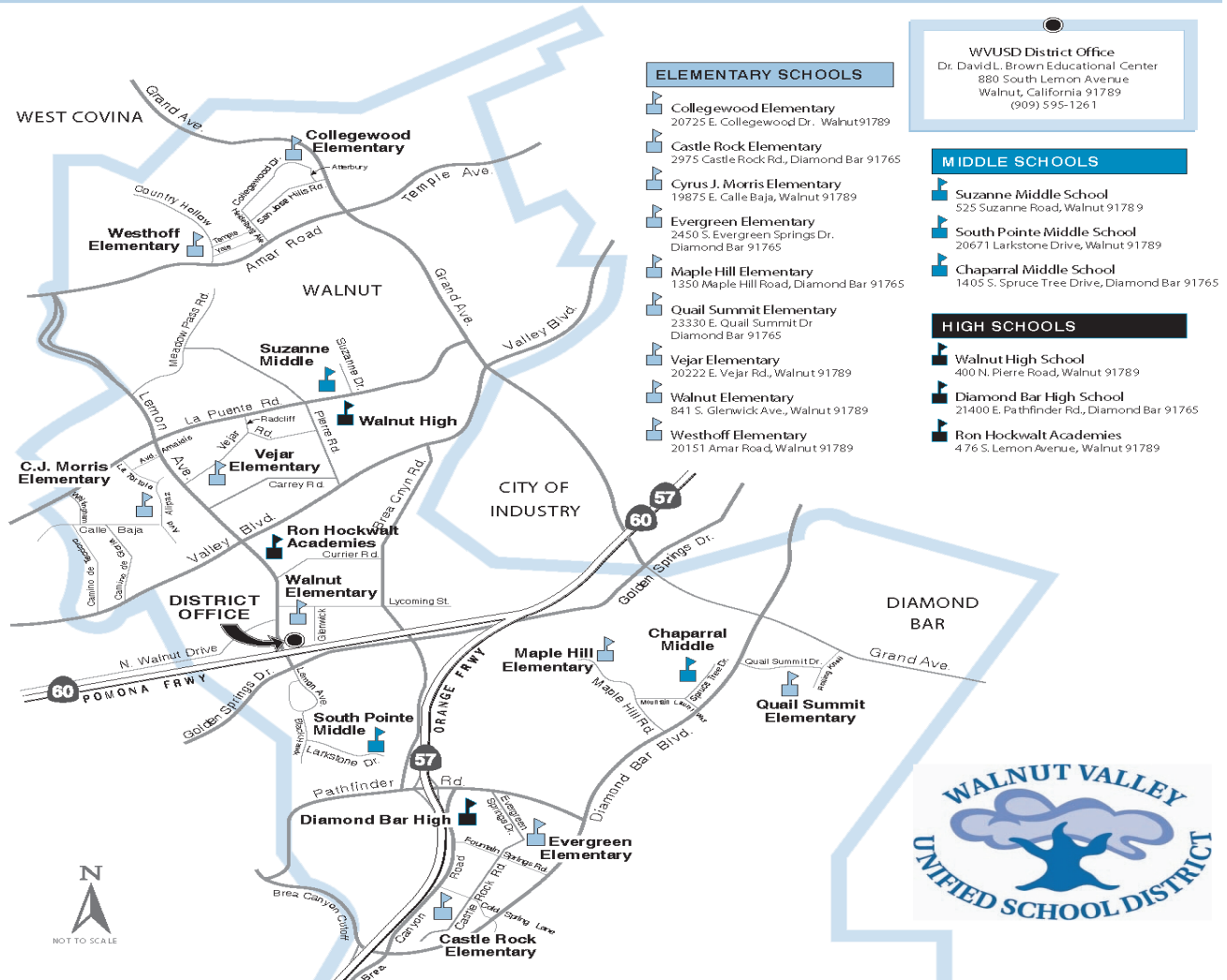


The mission of Walnut Valley Unified School District’s Transportation Department is to promote safe, dependable, efficient, and cost-effective services for the needs of students, staff, and community. The Transportation Department is responsible for providing safe transportation service for children to and from school and activity trips.

Source: Google Images

Figure 2: Map of Walnut Valley Unified School District

WALNUT VALLEY UNIFIED SCHOOL DISTRICT



Source: Walnut Valley Unified School District

The compressed natural gas (CNG) fueling system is located at 880 South Lemon Avenue, Walnut, California 91789, which is about three miles from the Pomona Freeway (California State Route 60), a major transportation corridor that is one of the busier freeways in the Los Angeles area as it serves as one of the main truck routes to the east and joins with many of the major freeways in Los Angeles on the west end.

The WVUSD’s CNG fueling station offers time-fill capability for refueling the district’s bus fleet for daily bus routes and field trips. The WVUSD’s fleet of 31 buses transports approximately 1,300 students daily from home to school.

Air pollution and climate change are exacerbated by the exhaust of transportation fuels. Diesel school buses make the air worse than lower emission natural gas buses where it is most critical to the health of school age children. Replacement of diesel with natural gas fueled

school buses continues to be a high priority adaptation to protect respiratory health and environmental stability.

Initial Situation

The CNG fueling station installed in 1990 at WVUSD was approaching the end of its useful life. The school district needed to upgrade the existing CNG fueling station that refueled the 21 natural gas bus fleet before the old compressors failed.

The budget restraints on school districts statewide forced the school districts to maintain their older diesel buses instead of replacing them in part because of the expense of the newer type of infrastructure needed to fuel cleaner natural gas buses. The WVUSD needed to expand its existing CNG station to increase the capacity to fuel additional natural gas buses. Without an expanded fueling station, the school district would have to go offsite to refuel diesel buses at the nearest diesel station 20 minutes away, instead of fueling natural gas buses onsite. Fueling was not cost effective in terms of time (and fuel) spent travelling to the diesel fueling station.

In early 2012, the CEC issued solicitation PON-11-602 for "Alternative Fuels Infrastructure Deployment: Electricity, Natural Gas, Propane, Ethanol blends and Diesel Substitutes" to provide funding opportunities under the Clean Transportation Program for projects which develop infrastructure necessary to store, distribute, and dispense electricity, Ethanol blends, propane, diesel substitutes, and natural gas.

With CEC funding, Walnut Valley Unified School District was able to move forward immediately with the upgrade of the compressed natural gas fueling station project.

Once the CNG fueling station upgrade project is complete, the WVUSD will have the opportunity to reduce both nitrous oxide and carbon dioxide emissions by replacing older diesel vehicles and offer a fueling source for neighboring school districts.

Project Objective

It is in the interest of WVUSD to have a reliable, permanent fueling station at the maintenance yard that provides all the CNG fueling needs for its current and future CNG fleet, which has the capability to provide fueling needs for neighboring districts and cities. The goal of this project is to upgrade the existing CNG fueling infrastructure which is prerequisite to reducing operating costs and reducing air pollution. The project would upgrade the existing CNG station with new larger compressors and additional time-fill hoses which in turn provide the school district the capability to replace the remainder of their diesel fleet with new natural gas buses. If the vehicles are acquired as planned, those fueling costs could be cut in half over the next three years plus personnel costs reduced by time-filling new natural gas buses versus fast-filling diesel buses. While WVUSD initially planned to use the fueling station for its own fleet vehicles, it does have the flexibility of opening access to other CNG light-duty vehicles or small buses. The WVUSD's CNG station is conveniently located near the 60 freeway in the San Gabriel Valley. This could be especially useful in providing redundancy to other school districts or nearby fleets.

CHAPTER 2:

Project Approach

The objective of this project was to replace, upgrade and expand the existing CNG fueling station owned by WVUSD. In 2012, WVUSD started to explore the replacement of the CNG equipment and adding more time-fill posts. The existing infrastructure including the compressors and dryer were not adequate to supply fueling for potential expansion of the CNG bus fleet. In March 2012 WVUSD applied for and was awarded a \$278,261 grant from the CEC to upgrade the existing CNG fueling station.

The school district performed all normal purchasing practices to contract for the CNG fueling station as well as project management to oversee the construction and reporting associated with the project.

Utility Service Upgrade

WVUSD worked with their gas utility company Southern California Gas Company (SoCalGas) to ensure sufficient fuel supply of the upgraded CNG fueling station, and to meet the new fueling station's utility needs.

WVUSD confirmed with SoCalGas that the district had sufficient inlet pressure and will not require a utility service upgrade that would require additional time to complete the project.

SoCalGas conducted the engineering assessment and confirmed the duplex compressors could be adequately served by the existing gas service line. The gas meter was upgraded per conditional use permit regulations. The existing electrical service was adequate for the project and did not require any upgrading.

In September 2015, SoCalGas completed the Natural Gas Vehicle Preliminary Site Evaluation form for sufficient fuel supply for the project. The form assists potential builders, owners, and operators of Natural Gas Vehicle refueling stations in understanding the preliminary gas service options currently available for various load scenarios at a specific site within the service territory of SoCalGas.

WVUSD met with SoCalGas in April 2016 to review gas line upgrade. The school district filed revised forms with SoCalGas to reflect 150 standard cubic feet per minute (SCFM).

System Design and Specifications

Originally, the CNG fueling station was to be constructed in partnership with a turnkey supplier Mansfield Gas Equipment Systems who had installed the original station. WVUSD had proposed a contract with Mansfield Gas Equipment to design, permit, and construct the upgrades to the CNG station. However, in 2013, Mansfield Gas Equipment Systems was acquired by Clean Energy Fuels Corp. and was unreachable for the project. The school district decided to go with a different contractor for a larger compressor system.

Multiple changes in management, decisions on how to bid for the project, changing of the subcontractor led to several delays in getting the project started. WVUSD would have to issue

a request for proposals for a new contractor to install the upgrades for the CNG fueling station.

In September 2014, SoCalGas presented a Tariff Proposal (to plan, design, construct, operate, and maintain the CNG fueling station) to the school district that was attractive, but well out of the school district's budget range. WVUSD decided to return to selecting a contractor to prepare the request for proposals.

Momentum for the project picked up in May 2015 when the School Board approved a consulting contract with Go Natural Gas for the design and permitting of the project.

In May 2015, ON-LINE Engineering was contracted to provide a topographic survey of the site to obtain a base map. ON-LINE conducted research to obtain record mapping centerline tie (survey lines that connect to a point to other surveyed lines to determine the center of an intersection) and benchmark information for the project site. With this information obtained, ON-LINE Engineering conducted a boundary analysis to determine the locations of the property lines and a field survey to measure the above ground features and topography within the project site.

In August 2015, Go Natural Gas worked with an architect to complete the site plan drawings. Go Natural Gas would include the site designs and specifications for the request for proposals released in October 2015. Go Natural Gas also filed plans with the Los Angeles County Fire department in February 2016 and received approval in March 2016. The permitting process was filed in conjunction with the Fire Marshall to ensure the CNG fueling station meets all the National Fire Protection Agency 52 and 57 codes, as well as performance requirements. With approval of the design, the school district was then able to order all equipment necessary for the project. The school district was also able to obtain all necessary final permits to begin construction.

Project Equipment

WVUSD had originally proposed to contract with Mansfield Gas Equipment Systems to design, permit, and construct a replacement CNG station consisting of two Ingersoll Rand compressors providing 56 SCFM and capable of producing about 24 diesel gallon equivalents an hour primarily for WVUSD's internal fleet on a time-fill basis. However, the original contractor was unavailable for the project, so the school district decided to go with a different contractor for a larger compressor system.

WVUSD posted a request for proposals for the equipment vendor in November 2015. The equipment bid was advertised and opened in December 2015. WVUSD awarded the equipment contract in January 2016 to Compressor Design and Services, Inc. located at 74885 Joni Drive, Suite #3, Palm Desert, California 92260.

The purchase order for the equipment was issued by the school district in February 2016. The time-fill posts and compressor were scheduled for delivery scheduled the second week of June and the natural gas dryer was scheduled for delivery the end of June. The school district received all equipment, compressors, dryers, and time-fill posts on time. Table 1 shows the equipment chosen by the WVUSD for the project.

Table 1: Equipment List

Quantity	Equipment	Specifications
2	Compressor	W120B1-AL High-Pressure, Air-Cooled Compressor – 75 SCFM electric, motor-driven, skid mounted CNG compressor system complete with integrated compressor and time-fill system controls including a communication panel, on-skid starter pane, and on-skid time fill panel.
1	Dryer	PSB Model NG-SV-6.5-2 Dryer – low-pressure non-regenerative desiccant-type gas dryer
14	Fueling Nozzle	CNG Nozzle, 3600 per square inch gauge
8	Time-fill post assemblies	Dual-hose non-metered time-fill post assemblies

Source: Compressor Design and Services, Inc.

Site Preparation, Construction, and Installation

To obtain the most cost-effective pricing, WVUSD released a call for bids prior to entering into an agreement for services. WVUSD released bid openings for the CNG Fuel Facility Upgrade Project. The notice to contractors was published in March 2016 and a mandatory job walk was held in the same month. Four contractors attended the job walk, two purchased plans and one bid on the project. After reviewing all documents and checking references, WVUSD recommended entering into an agreement with Fueling and Service Technologies, Inc. dba Fastech. In April 2016, the School Board approved an agreement between WVUSD and Fastech to furnish all labor, materials, and complete all work required installing the replacement equipment for the CNG fueling station upgrade project. A Notice to Proceed for construction was issued by the school district to Fastech.

Construction for the project started in May 2016. Fastech performed a lockout of the old station to protect personnel from unexpected startup of the old equipment. They removed the older equipment and completed trenching for electrical, gas lines, and fueling posts (See Figures 3 and 4 below). They also cut and removed noncompliance bollards.

Figure 3: CNG Station Demolition



Source: Walnut Valley Unified School District

Figure 4: Trenching for Time-Fill Post Assemblies



Source: Walnut Valley Unified School District

After the site preparations were completed, the contractor installed the new CNG equipment (compressor, dryer, time-fill post), new fencing and concrete masonry unit block wall enclosure, emergency shutdown buttons, and signage. The existing parking lot slurry coated and restriped. Relocated existing light pole and installed new head, as well as installed two new light poles and heads. There was a final fire and building inspection before the start-up

and commissioning of the CNG fueling station. Figures 5–8 show the installation of the equipment.

Figure 5: Equipment Installation



Source: Walnut Valley Unified School District

Figure 6: New Compressors



Source: Walnut Valley Unified School District

Figure 7: Time-Fill Post Assembly



Source: Walnut Valley Unified School District

Figure 8: Installed Time-Fill Post Assembly



Source: Walnut Valley Unified School District

Commissioning

Compressor Design and Services, Inc. performed the commissioning of the compressor packages on July 8, 2016. The installation and commissioning consisted of testing the utility gas and electric connections, as well as complete operation of the compressor package.

Compressor pressure and temperatures were within the standard expected range with only a slightly lower inlet pressure than expected. This was due to an inlet regulator that was installed previously by the city gas company. The regulator was replaced soon after and both compressors have been well within expected operating parameters. There was no delay or issue due to low inlet pressure.

The WVUSD was able to start up the fueling system on July 8, 2016. The parking lot at the site yard was slurred and lighting was completed, and training all took place in July with no complications.

Training

Compressor Design and Services, Inc. employees (William Brinson, Tony Dispoto, and Kameron Clifford) held training on July 12, 2016 for WVUSD employees to explain proper procedures for maintaining the CNG compressor packages.

WVUSD mechanics that attended training can monitor the compressor packages and report any issues to Compressor Design and Services, Inc. The station will be monitored daily for trouble codes on the control panel, check for any abnormal sounds, monitoring pressure levels, and ensuring sufficient oil in the units. Monthly services and any routine maintenance will be performed by a trained Compressor Design and Services, Inc. technician to assure continuous operations of the system.

Subcontractors for Project

A total of five subcontractors were hired for this project, the subcontractor's names and contract details are listed below in table 2.

Table 2: Subcontractors for the Project

Subcontractor	Address	Subcontractor Total Amount	Subcontract Term Began	Purpose of Subcontract
ON-LINE Engineering	1657 E. Orange Grove Blvd. Pasadena, CA 91104	\$7,000	5/11/2015	Topographic survey
Go Natural Gas, Inc.	1644 N. El Camino Real San Clemente, CA 92672	\$34,800	4/15/2015	Design and provide engineering specifications for the CNG fueling station
Compressor Design and Services, Inc	74885 Joni Drive, Suite 3 Palm Desert, CA 92260	\$258,952	2/02/16	Provided Duplex Compressor

Subcontractor	Address	Subcontractor Total Amount	Subcontract Term Began	Purpose of Subcontract
				package and Time- Fill Posts
Southern California Gas Company	PO Box 2007 Monterey Park, CA 91754	\$6,007	Service requested September 2015	Utility service upgrade
Fueling and Service Technologies Inc. dba Fastech	7050 Village Drive, Suite D Buena Park, CA 90621	\$556,608	4/21/2016	Construction

Source: Walnut Valley Unified School District

CHAPTER 3: Data Collection and Analysis

Data Collection Plan

Samantha Horton collected data using multiple sources. SoCalGas meter and monthly statements were used to supply gas usage in therms. The service agreement with Compressor Design and Services, Inc. includes reports that were available to determine compressor run time in hour and Gallon Gasoline Equivalents. The WVUSD transportation department keeps daily reports on vehicles and mileage. These reports were analyzed to determine the vehicle use and mileage as well as the monthly fueling.

Data Collection

Six months of throughput, usage, and operations data from the project was collected, and is shown in Table 3 below.

Table 3: Six Months of Data Collection

	July 2016	Aug 2016	Sept 2016	Oct 2016	Nov 2016	Dec 2016
Therms as Documented by Utility Bills	1,043	3,162	5,460	6,076	5,529	3,851
Compressor Run Time (Hours)	35	101	136	326	549	642
Gallon Gasoline Equivalent	1,240	3,575	4,814	11,540	19,434	22,726
Average Number of Non-District Vehicles Fueled per Month	0	0	0	0	0	0
Average Number of Type 1 Bus Fueled per Month	12	19	20	20	22	22
Average Number of Type 2 Bus Fueled per Month	0	0	0	0	0	0
Number of Days per Month Vehicles were Fueled	10	20	23	26	25	19
Maximum Capacity of the New Fueling System (SCFM)	75	75	75	75	75	75
Miles Traveled per Bus by Odometer Reading	1,295	8,669	16,291	20,967	18,068	11,928
Gallons of Gasoline and/or Diesel Fuel Displaced by Using Natural Gas (with Associated Mileage Information)	259	1,734	3,258	4,193	3,614	2,386

Source: Walnut Valley Unified School District

Analysis

The CNG fueling station started up on July 8, 2016. There was low usage in July and August 2016 due to summer recess. School resumed on August 18, 2016. October 2016 saw a spike in usage due to higher-than-normal number of field trips for the school year. There was also a dip in usage in December 2016 due to winter recess between December 17–31, 2016.

Proposed Results versus Actual Results

In the original proposal submitted to the CEC, the school district planned to install eight additional dual time-fill posts with two hoses each and retractable hose reels to allow the district to refuel as many as 16 additional buses overnight taking approximately 10 diesel gallon equivalents each in a 10-to-11-hour period. The system will be plumbed for future expansion to allow for further refueling posts to utilize the capacity of the compressors until it is outgrown in approximately 10 years as WVUSD start putting their support vehicles on natural gas as well.

The proposed compressor skid includes two dual or redundant Ingersoll Rand compressors, or equal, capable of producing 56 SCFM working together or about 0.4 diesel gallons equivalents a minute at 3,600 per square inch.

The expected load on the station is estimated at about 270 diesel gallon equivalents per day when all of the district buses are running on CNG.

The district started with 16 CNG buses and added two more CNG buses in spring 2012. The district expected to increase the fleet with 10 additional buses by 2014, retiring the older pre 1997 diesel buses. With the expected expansion and upgraded CNG fueling system, the district expects to use about 270 diesel gallon equivalents a day. Since the compressors are expected to produce about 300 diesel gallon equivalents over a 12-hour period at night ($56/135 \times 60$ minutes \times 12 hours), the system should serve the needs of the district easily for the next 15 years or more.

The proposal expected the WVUSD to use about 270 diesel gallon equivalents per day with a fleet of 28 CNG buses. Based on the six months of usage, the new CNG station used about 453 diesel gallon equivalents per day for 22 CNG buses, an increase of the proposed anticipated usage for the CNG fueling station.

CHAPTER 4:

Project Outcome

The objective of this project was to upgrade and expand the existing CNG station owned by Walnut Valley USD.

Observations and Conclusions

The existing CNG station was at the end of its useful life and the WVUSD had more buses than time-fill hoses. This project was a success in that the CNG station now can produce 70 Gallon Gas Equivalent per hour and fuel all CNG buses at once overnight. The compressors have been running well ever since commissioning.

In 2012, WVUSD had 18 CNG school buses. Through the course of the project, WVUSD replaced three diesel buses with CNG school buses. The intent of the school district with successful project implementation is to eventually replace the remaining diesel buses with CNG. The WVUSD has been able to stop using diesel and run almost exclusively with CNG buses since the installation and startup of the new station.

Figure 9: Walnut Valley USD Bus Fleet



Source: Walnut Valley Unified School District

Recommendations

Many school districts do not have the funds to modify maintenance facilities that work on CNG vehicles. Future funding could be considered to upgrade CNG maintenance facilities to include a methane detection system.

Additional public fueling stations are needed for alternative fueling options. There have been occasions where WVUSD buses have traveled outside their immediate area and needed to fuel. Finding a public station nearby can be difficult and may take different types of payment systems. For example, one WVUSD bus had to travel 10 miles to the closest fueling station to only find out that they do not work for 3,000 per square inch. The bus driver drove an additional 20 more miles to the next station, but that station did not accept VISA for payment.

Although the funding is much needed and provided us the opportunity to build a new station, the application process was a difficult one. The filing of reports and invoicing could be more simplified for future applicants.

GLOSSARY

CALIFORNIA ENERGY COMMISSION (CEC)—The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The CEC's five major areas of responsibilities are:

1. Forecasting future statewide energy needs.
2. Licensing power plants sufficient to meet those needs.
3. Promoting energy conservation and efficiency measures.
4. Developing renewable and alternative energy resources, including providing assistance to develop clean transportation fuels.
5. Planning for and directing state response to energy emergencies.

Funding for the CEC's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account, and other sources.

COMPRESSED NATURAL GAS (CNG)—Natural gas that has been compressed under high pressure, typically between 2,000 and 3,600 pounds per square inch, held in a container. The gas expands when released for use as a fuel.

STANDARD CUBIC FEET PER MINUTE (SCFM)—The molar flow rate of a gas corrected to standardized conditions of temperature and pressure, thus representing a fixed number of moles of gas regardless of composition and actual flow conditions.

SOUTHERN CALIFORNIA GAS COMPANY (SoCalGas)— As the nation's largest natural gas distribution utility, SoCalGas (a regulated subsidiary of Sempra) delivers increasingly clean, safe, and reliable energy to 21.8 million consumers through 5.9 million meters in more than 500 communities.¹

WALNUT VALLEY UNIFIED SCHOOL DISTRICT (WVUSD)—The Walnut Valley Unified School District is located in the eastern portion of Los Angeles County and is a part of the Greater Los Angeles Area of the U.S. state of California. It serves the city of Walnut and much of the city of Diamond Bar²

¹ [SoCal Gas Website](https://www.socalgas.com/about-us/company-profile) (https://www.socalgas.com/about-us/company-profile)

² [Walnut Valley USD Website](https://www.wvUSD.org/) (https://www.wvUSD.org/)