

# Compressed Natural Gas (CNG)

*Bringing Sustainable Fuel To Jacksonville*

## CASE STUDY



JACKSONVILLE  
TRANSPORTATION  
AUTHORITY



# Compressed Natural Gas (CNG) **CASE STUDY**

---

## TABLE OF CONTENTS

Abstract	1
CNG: The Right Choice	2
Engaging the Industry	3
The RFP	4
Project Delivery	5
Success	7
Lessons Learned	8

# ABSTRACT

In 2013, the Jacksonville Transportation Authority (JTA) under CEO, Nathaniel P. Ford Sr., shifted the Authority's focus to becoming a regional transportation leader that provides sustainable commuting options for future generations.

One area that came under immediate review when Ford came on board was diesel fuel. At the time, the Authority was spending \$9 million annually on fuel accounting for about 15 percent of bus operating costs. An earlier purchase of seven diesel hybrid electric buses resulted in fewer emissions but did not generate the desired financial benefits. With an eye toward savings, cost efficiency and the environment, the Authority commissioned an Alternative Fuels Study to identify viable alternatives to diesel. The goal was to find a fuel with low emissions that was cost effective, clean and sustainable.

The study examined:

- Ultra-low sulfur diesel
- Hybrid electric
- Biodiesel
- Compressed Natural Gas
- Electric
- Hydrogen Fuel Cell

After a thorough analysis, the study recommended Compressed Natural Gas (CNG) as the most promising option.

While the average mile per gallon on CNG buses was lower than diesel or hybrid electric (3.8 miles for CNG compared to 5.5 miles for diesel and 4.2 miles for hybrid electric buses), CNG had lower fuel costs, was domestically available and the world's reserves were three times more than diesel. Those factors provided the Authority with the long-term financial stability it was seeking. Additionally, CNG had proven technology.

The JTA Board of Directors eagerly embraced CNG as the most viable option for the Authority to pursue. The progressive, forward-thinking body was aware of the growing importance CNG had in the region and they wanted the JTA to be a catalyst for change. With 100 percent support, the Board approved the use of CNG, making the JTA one of a growing number of public transportation systems in the U.S. to use compressed natural gas.

The timing of the decision was critical for the First Coast Flyer (FCF), the Authority's bus rapid transit (BRT) system that would launch in late 2015 with 11 CNG buses. Both the CNG and the FCF are part of the JTA's Blueprint 2020, a subset of the Blueprint for Transportation Excellence, the Authority's visionary road map of priority initiatives.



# CNG: THE RIGHT CHOICE



In late 2013, armed with recommendations from the alternative fuel study and best practices from peer transit agencies, the JTA leadership was convinced that converting a portion of the Authority's bus fleet to CNG was both cost effective and environmentally smart.

However, before moving forward on the recommendation, the JTA Board of Directors had to approve the plan. Approval was swift, thanks in part to the Board's enthusiasm to signal the JTA's environmental stewardship and recognition of how important it is to reduce America's dependence on foreign oil. While early experiments with natural gas were not always successful, demand for CNG had increased dramatically due to the stability of natural gas, low prices and its proven technology.

The case for CNG was reinforced when a recent purchase of seven diesel hybrid buses revealed the fuel cost savings for the hybrids was offset by the higher purchase price of the buses.

Understanding that a transit bus has a 10 to 12 year lifespan, the CEO and Executive Leadership Team sought to diversify the Authority's fleet with the goal of introducing up to 100 new CNG buses over a 5-year period ending in 2020.

Although CNG was not new to Jacksonville, the JTA spearheaded the growing momentum to make it more readily available in the region, a move supported by the Chamber of Commerce, the North Florida Transportation Planning Organization (TPO) and the business community.

## Why Compressed Natural Gas for the JTA?

### Converting to Compressed Natural Gas:

- Demonstrates leadership in the industry and community
- Makes case for developing natural gas in the region
- Enhances JTA's financial stability
- Promotes environmental sustainability
- Provides appealing procurement and financing options
- Builds a more robust JTA Campus Master Plan

# ENGAGING THE INDUSTRY

Soon after obtaining the JTA Board's approval to move forward with plans to add CNG powered buses to the Authority's bus fleet, staff went to work.

Ordering the buses was the easy part. The challenge was where to locate a fueling station, how to plan the facility to accommodate it, the cost to operate and maintain the station and where the funding would come from to build it. The JTA also had to determine how to create space for more buses and additional parking and make operational improvements outlined in the Authority's Campus Master Plan. The feedback would be used to develop a Request for Proposal to design and build the CNG facility.

As part of their due diligence, the JTA convened a CNG Forum in January 2014 to solicit input from peer agencies and industry experts about the best way to proceed. The forum drew more than 100 participants from throughout the Northeast Florida region, the U.S. and Canada.

Two delivery options emerged from the forum that the JTA strongly considered before moving forward.

**Option 1** would require the JTA to design, build, operate and maintain the proposed CNG facility, and incorporate CNG fueling dispensers into existing fuel lanes. The option would also require the Authority to purchase fuel from a third-party gas supplier. The funding would come from the JTA or a third-party financing source.

**Option 2** would involve the JTA entering into a Public-Private Partnership (P3). The agreement would require the facility to be owned and operated by a private company for a period of 15 years.

The private entity would also install fueling dispensers and maintain fuel lanes on the property for public access. The public, in turn, would purchase fuel at the CNG fueling station, from a public access fueling station on the property. Other considerations included:

- Federal and State Grants
- Local Funds
- JTA Interlocal Agreements to allow fueling for other agencies
- Federal tax credits
- Alternative fuel incentive programs

CNG technology was new to the JTA, but early in the information-gathering process the Administration knew two things for sure:

- The Authority did not want to drain its capital reserves by building the facility; and
- The JTA did not want to operate and maintain a CNG fueling facility, because that was not its area of expertise.

Before an RFP was developed, the JTA applied for and received a \$2.7 million Transportation Regional Incentive Program (TRIP) grant from the Florida Department of Transportation (FDOT) through the North Florida TPO. The support of the two entities was a game-changer and enabled the project to receive the green light to proceed. However, the funding came with the stipulation that the JTA provide an access station for the public. The requirement solidified the JTA's desire to make CNG more accessible to consumers. The Authority knew going forward that it needed two CNG locations, one for the public and one for the Authority's bus fleet, thus making a P3 arrangement the best option.

## **Option 1: Jacksonville Transportation Authority**

- Design, build, operate and maintain contract
- Incorporate fueling dispensers into existing fuel lanes
- Negotiate and purchase fuel from a gas supplier
- Control access to outside fleets during non-peak fueling times
- Secure JTA funding or third-party financing

## **Option 2: Public-Private Partnership (P3)**

- Owned and operated by private company
- Install fueling station and maintain fuel lanes on property for public access
- Purchase fuel from facility owner

# THE RFP FOR P3

Less than 30 days after the JTA hosted the CNG Forum hosted by the JTA to invite industry input, the Authority developed a Request for Proposal and was ready to advertise for construction of the \$8.5 million infrastructure improvements and facilities needed for the CNG initiative.

During the interim, some major decisions were made:

1. The Authority would convert an average of 20 buses a year to CNG over a five-year period, for a total of 100 buses. Many of the buses would be utilized for the soon to be introduced First Coast Flyer (FCF) bus rapid transit system.
2. The CNG fueling facility would be located at the JTA's Myrtle Avenue Campus. A fueling station would be built for public access to fulfill the requirements of the TRIP grant.
3. To accommodate the CNG facility and additional buses for the First Coast Flyer, the Myrtle Avenue facility would become an operations campus. Those requirements were incorporated in the P3. The JTA then temporarily relocated administrative offices to downtown Jacksonville, and moved Connexion operations from Richard Street to Myrtle Avenue and reconfigured parking.

The JTA evaluated responses from two providers - one of which was the clear choice, Clean Energy Fuels Corp. The company, based in Newport Beach, CA, specializes in building and operating CNG facilities for transit authorities, government entities and other large clients throughout the country.

The CNG initiative, one of the JTA's Blueprint for Transportation Excellence initiatives, was fast tracked. Clean Energy had one year from the contract award in December 2014 to the fueling of the FCF buses in December 2015 to plan, design and build the CNG facility or risk daily fines. All deadlines were met and the project was completed both ahead of schedule and within budget.



## THE P3 AGREEMENT

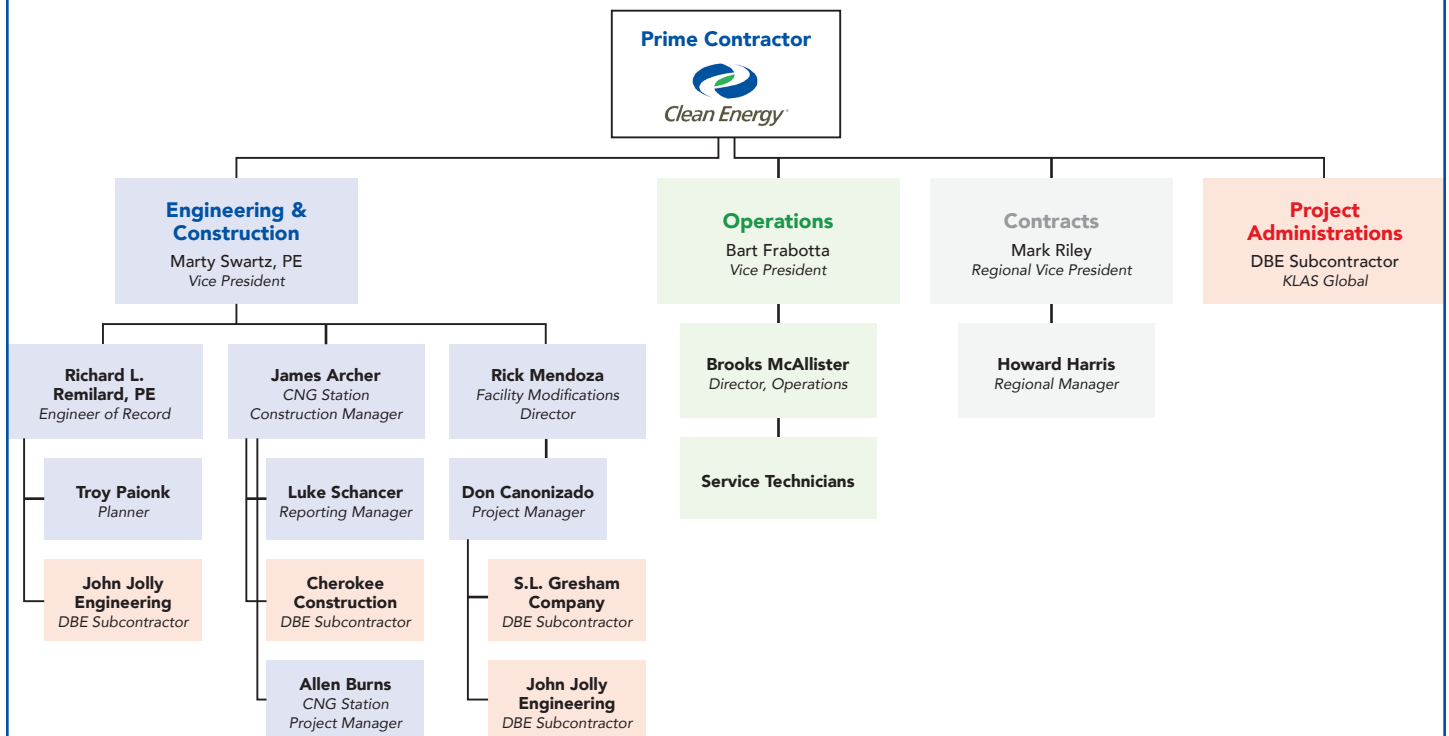
<b>CNG Fueling Station</b>	<ul style="list-style-type: none"> <li>• Design and build infrastructure for fueling JTA fleet</li> <li>• Design and build required modifications to existing maintenance building</li> <li>• JTA to purchase 100 buses over five years</li> <li>• Operate and maintain the fueling infrastructure and facilities modifications for 15 years</li> </ul>
<b>Campus Improvements Implementation</b>	<ul style="list-style-type: none"> <li>• Demolish and re-purpose a portion of the Myrtle Avenue administration building</li> <li>• Design and build new parking spaces for buses and vehicles</li> <li>• Temporarily relocate administrative offices</li> </ul>
<b>Public Access Station</b>	<ul style="list-style-type: none"> <li>• Design and build public access fueling station</li> <li>• Provide operations and maintenance of the public access station for 15 years</li> </ul>

# PROJECT DELIVERY

Clean Energy selected a team to ensure that the CNG Station and Building Modification Project was a success.



JACKSONVILLE  
TRANSPORTATION  
AUTHORITY



**THE CNG PROGRAM SCHEDULE**

DATES	IMPLEMENTATION TASKS
January 2015	<ul style="list-style-type: none"> <li>• Clean Energy submittal of 60% infrastructure plans</li> <li>• Comments due on 60% facility modifications submittal</li> <li>• Official kickoff meeting</li> <li>• Comments due on 60% infrastructure plans</li> <li>• CE cost proposal for restoring 4,000 SF of administration building</li> </ul>
March 2015	<ul style="list-style-type: none"> <li>• 100% plans submittal</li> <li>• Official groundbreaking</li> <li>• Construction begins</li> </ul>
May 2015	<ul style="list-style-type: none"> <li>• Administration building demolition</li> </ul>
December 2015	<ul style="list-style-type: none"> <li>• Fueling station completion</li> </ul>





# SUCCESS

The historic partnership between Clean Energy and the JTA enabled the Authority to deliver on its commitment to bring CNG to the region and support the First Coast Flyer. The value for money comparison immediately saved the JTA upfront capital and operating expenditures, which underscored the business case for using a P3.

The staff initially planned to use electric buses for the FCF fleet. An environmental assessment called for the use of hybrid buses to mitigate noise. No changes to the plan could be made without approval from the Federal Transportation Administration (FTA).

The JTA had to update the environmental assessment to determine if CNG buses would satisfy FTA requirements. If the requirements were not satisfied, implementing the CNG initiative would not have been feasible. However, the JTA subsequently received FTA approval to proceed.

The first delivery of CNG buses arrived on schedule in September 2015. Some of the buses were branded the First Coast Flyer to reflect the North Florida region and the quicker ride the BRT provides.

With the new system in place, CNG will help preserve air quality for the next generation of public transit customers by reducing the carbon emitted in the environment and by providing long-term financial stability.



# LESSONS LEARNED



- The process is time consuming. Plan accordingly.
- Get industry feedback to gauge/generate interest in your CNG initiative before issuing an RFP.
- Collaboration is key. Devise a method where the project team can communicate daily.
- Anticipate unforeseen issues such as contaminated soil that has to be removed and inclement weather that can cause construction delays.
- Allow ample time to go through the permitting process. Coordinate early with local permitting agencies.
- Develop a strong internal working group with Operations, Maintenance, Safety and Security, Finance, Planning and Risk.
- Conduct biweekly meetings with partners, contractors and subcontractors to keep everyone updated on the project status.
- Be flexible in the process.
- Maintain transparency to strengthen trust.
- Celebrate milestones to heighten awareness.
- Work closely with local agencies, such as your fire department.

## *Did you Know?*

More than 41 percent of public transit buses use CNG or other alternative fuels compared to 2.8 percent in 1996.

**Public transportation agencies in the U.S. that use CNG include:**

- Los Angeles County Metropolitan Transportation Authority
- Metropolitan Transportation Authority in New York
- The Sacramento Regional Transit District
- Dallas Area Rapid Transit
- Central Florida Regional Transportation Authority
- Valley Metro in Phoenix and
- Hillsborough Area Regional Transit Authority in Tampa

**\*Source: American Public Transportation Association**

www.cleanenergyfuels.com

# Natural Gas for Vehicles

THIS SALE  
\$ 5.68  
25.27  
GASOLINE GALLON EQUIVALENT

Welcome to Clean Energy!  
Have You Read  
and Understood  
the Posted Fueling  
Instructions?

Price Per  
GGE



www.cleanenergyfuels.com

#### REFUELING INSTRUCTIONS STOP MOTOR NO SMOKING FLAMMABLE GAS

1. Ensure the vehicle engine is turned off.  
2. Read the location of the emergency shut-off valve.  
3. Read the posted fueling instructions.  
4. If the equipment is equipped to accept credit cards, insert your card and follow the card reader instructions.  
5. If the equipment is not equipped to accept credit cards, insert cash.  
6. Lift the equipment handle. Check the display for the correct flow, amount and other information.  
7. Turn the handle to the left.  
8. Lift the equipment handle and insert the nozzle into the vehicle.  
9. Lower the equipment handle and return the nozzle to the station.

Lift  
Handle  
To  
Fuel

FILLING PRESSURE (PSI)

For details on vehicle equipment needed  
Clean Energy  
Call 1-866-278-3674\*  
\*Additional equipment needed for certain makes and models  
ITA JACKSONVILLE FL #20508

  
**Clean Energy**

www.cleanenergyfuels.com



JACKSONVILLE  
TRANSPORTATION  
AUTHORITY

121 W. Forsyth Street, Suite 200  
Jacksonville, Florida 32202  
Office: (904) 630.3181  
[www.jtafla.com](http://www.jtafla.com)