

MINUTES OF THE FINANCE COMMITTEE
December 4, 2017
Auditorium

Present: Councilmembers Bullock, O'Malley, Nowlin

Also present: Councilmembers Marx, Litten, Anderson, and O'Leary, Finance Director Pae, Assistant Finance Director Schuster, Public Works Director Beno, Human Resources Director Yousefi, Human Services Director Gelsomino, Mayor Summers, Council-elect Meghan George and Tristan Rader, two members of the public and Andrew Conley and Jason Phillips of Clean Fuels Ohio

Call to Order: 5:38 p.m.

Clean Fuels Ohio report on Lakewood vehicle fleet alternatives analysis study

Councilmember Bullock introduced the topic, remarking that this item was designated a Council priority in 2016 for the 2017 budget year. As such, the City contracted with Clean Fuels Ohio to perform the study. Today's overview falls under the category of oversight. He noted that the study results should inform the kinds of vehicle fleet investments that the City makes in 2018.

Mr. Conley delivered the attached presentation. He provided an overview of Clean Fuels Ohio and discussed its mission. He explained what deliverables are included in all Clean Fuels Ohio reports.

After studying the City's fleet and analyzing its patterns of use, Clean Fuels Ohio arrived at several recommendations that it presented including:

- Using biodiesel fuel
- Introduce propane vehicles
- Incorporate hybrid and electric vehicles for sedans and passenger vehicles
- Acquire efficiency technologies to improve MPG and reduce idling

He explained how Clean Fuels Ohio arrived at these recommendations including future projections of the cost of fuels and multiple other data points.

Mr. Conley pointed to the availability of certain state and federal funds that will become available this year to help finance investments in alternative fleet expenses.

The Committee discussed potential opportunities to collaborate with other communities on these initiatives. Mr. Conley discussed the key findings and recommendations from analyses performed on behalf of the City of Cleveland, CWRU, and University Circle.

Mr. Conley discussed the logistics of propane vehicles and how they get fueled up. He provided an update that RTA is considering electrifying routes.

Mr. Conley stated that the draft report will be finalized within the next month and that feedback from the City can be incorporated up until that point.

The Committee and Mr. Conley discussed steps that the City has taken to proactively update some diesel vehicles with added filtration to protect air quality. Mr. Conley discussed the environmental benefits of each type of alternative fuel/technology.

Review of Budget Ordinances and Budget Overview

Mayor Summers made introductory remarks about the proposed 2018 budget stating that it is narrowly balanced and contains very conservative estimates of zero growth. Realistically, the City is hoping to see some growth but has balanced the budget on the assumption that there will be none.

Director Pae provided an overview of the 18 ordinances which support the information contained within the budget book. The salary ordinance is an additional budget-related ordinance.

There are three ordinances designed to wrap up the 2017 budget:

- Ord. 40-17 – permanent appropriations
- Ord. 41-17 – 4th quarter transfers and advances
- Ord. 43-16C – changes to purchasing and contracting authority

Director Pae described the relationship between granting appropriations and establishing contracting authority. She explained that it is at Council's discretion to grant contracting authority, however if it chooses not to then Council dockets will be filled with ordinances required to approve individual contracts for salt, office supplies, etc. Contracting authority is only granted up to \$7,500. Amounts beyond that go before Board of Control.

The point was made that much of the City's budgeting and accounting procedures are set by its auditors and by law, in addition to local methods and procedures outlined in the budget book.

Councilmember Bullock questioned whether Council should have a representative on the Board of Control.

Director Pae explained that contracting authority is granted across funds and therefore may not align perfectly with fund balances. She used the example of fuel which is purchased by many departments

Macro-level 2018 appropriations

- Ord. 42-17

2018 Purchasing Contracting Authority

- Ord. 43-17 – Contracting Authority for Professional Services
- Ord. 44-17 – Contracting Authority for Planning & Development
- Ord. 45-17 – Contract Authority for Memberships – this ordinance lists all memberships including those with no cost
- Ord. 46-17 – Sewer Rates
- Ord 47-17 – Water Rates

Regarding Ordinances 43-17 and 44-17 Director Pae remarked that estimates are made based on trends and anticipating future year projects. Amendments are made to these ordinances during the year as needed. Water and sewer rates have yet to be set for the year. This will be discussed more at length on 12/16.

Capital contracting Ordinances

- Ord. 48-17 - Contracting Authority for Street Infrastructure Improvements
- Ord. 49-17 - Contracting Authority for Wastewater System and Treatment Improvement
- Ord. 50-17 - Contracting Authority for Water System Replacement Program
- Ord. 51-17 - Contracting Authority for CDBG Fund Infrastructure Improvements
- Ord. 52-17 - Contracting Authority for Vehicles, Machinery, and Equipment
- Ord. 57-17 - Contracting Authority for Buildings and Facilities Improvements
- Ord. 53-17 - Contracting Authority for Traffic Signs and Signals
- Ord. 54-17 - Contracting Authority for Parks & Pools Improvements
- Ord. 55-17 - Contracting Authority for Sidewalk improvement Program

Director Pae remarked that while it is possible to create one master ordinance containing all of the capital projects that bond counsel advises that each project have its own ordinance for financing purposes.

Salary Ordinance

- 58-17 – Salary Ordinance

Salary ordinance reflects the Cost of Living Adjustment and other salary adjustments.

Director Pae explained the status of the water and sewer rate ordinances and the final business that needs to take place before exact numbers are plugged in. She agreed to provide a draft version of the 12/16 presentation in advance.

Mayor Summers remarked on the importance of maintaining headcount at 410 full time employees since the expense of salaries and benefits is such a significant part of the budget. After headcount the next biggest budget consideration is strategy. This year's strategy does not significantly differ from that of years' past and so initial drafts of the budget did not present gaps.

Director Pae remarked further on the point of crafting a budget without gaps. She pointed to the importance of monitoring incoming revenues on a monthly basis, maintaining headcount, and also monitoring fringe benefits and workers' compensation.


The Committee discussed trends in insurance claims and that the past two years have been particularly high.

Director Pae agreed to email the Directors' internal budget forms to Council and the 2016 flow chart of funds. The 2017 chart won't be completed until 2018.


The Committee discussed the difference in the Street Infrastructure and Parks and Pools budgets between 2017 and 2018. The numbers are driven by planned projects in the capital program and comes down to the timing of projects. Street projects will be reduced in 2018 and the focus will be on resurfacing the length of Lake Ave.

Mayor Summers provided an update on the work the employee/management health insurance committee has been doing throughout 2017. It is expected that changes will be made to the employee health plan in 2019. Council will be asked to approve these changes. Recommendations will be made to Council no later than Fall of 2018. Councilmember Bullock proposed a hearing in early 2018 so that Council can begin to understand this topic.




Finance Committee adjourned at 6:57 p.m.



**City of Lakewood Feasibility Study:
Alternative Fuels & Efficiency Options Analysis**

CleanFuels Ohio

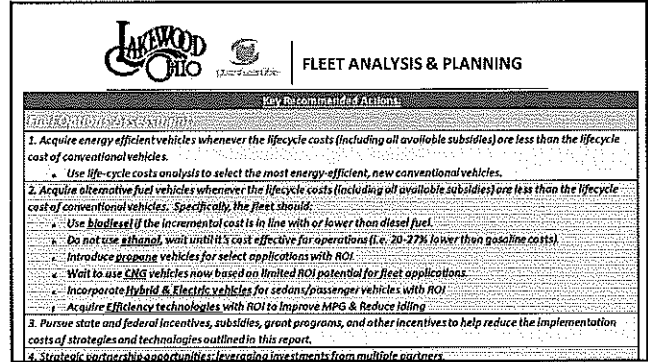
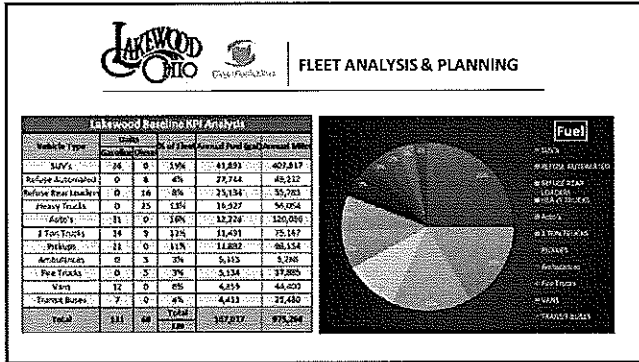




FLEET ANALYSIS & PLANNING

Fleet Alternative Fuel Vehicle (AFV) Feasibility Reports:

- Work with City of Lakewood & Cleveland Metroparks personnel to establish:
 1. Key Fleet Performance Indicators & Operational Baseline Metrics
 2. Provide AFV options, operational cost, & ROI factors
 3. Detail Station/Infrastructure Investments
 4. Recommendations for Regional Partner Investments

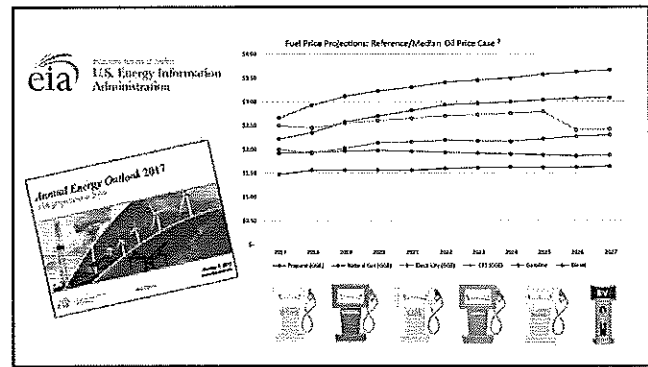


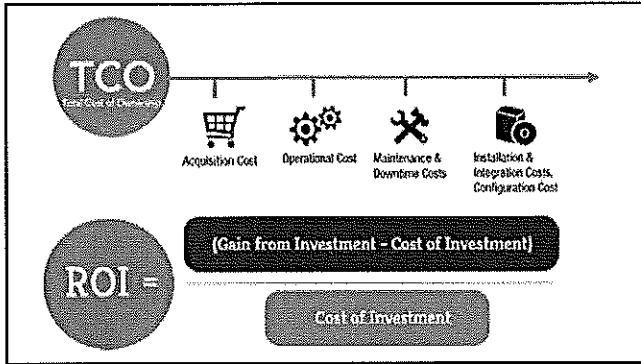



- Key Recommended Actions**
1. Acquire energy efficient vehicles whenever the lifecycle costs (including all available subsidies) are less than the lifecycle cost of conventional vehicles.
 - Use life-cycle costs analysis to select the most energy-efficient, new conventional vehicles.
 2. Acquire alternative fuel vehicles whenever the lifecycle costs (including all available subsidies) are less than the lifecycle cost of conventional vehicles. Specifically, the fleet should:
 - Use bio diesel if the incremental cost is in line with or lower than diesel fuel.
 - Do not use ethanol, until it's cost effective for operations (i.e. 20-27% lower than gasoline costs)
 - Introduce propane vehicles for select applications with ROI.
 - Wait to use LNG vehicles now based on limited ROI potential for fleet applications.
 - Incorporate Hybrid & Electric vehicles for sedans/passenger vehicles with ROI.
 - Acquire Efficiency technologies with ROI to improve MPG & Reduce Idling.
 3. Pursue state and federal incentives, subsidies, grant programs, and other incentives to help reduce the implementation costs of strategies and technologies outlined in this report.
 4. Strategic partnership opportunities: leveraging investments from multiple partners.

Independent Statistics & Analysis
U.S. Energy Information Administration

Year	Gasoline Gallon [2016 Dollars]			Diesel Gallon [2016 Dollars]		
	Low Reference	Median Reference	High Reference	Low Reference	Median Reference	High Reference
2018	1.55	2.17	3.37	1.85	2.71	4.08
2019	1.62	2.37	3.65	1.88	2.88	4.63
2020	1.65	2.49	4.27	1.88	2.98	5.07
2021	1.69	2.60	4.60	1.88	3.06	5.40
2022	1.74	2.71	4.88	1.89	3.16	5.68
2023	1.72	2.74	4.95	1.88	3.20	5.79
2024	1.71	2.76	4.96	1.88	3.23	5.85
2025	1.73	2.81	4.89	1.91	3.31	5.78
2026	1.74	2.84	4.89	1.93	3.36	5.83
2027	1.75	2.85	4.91	1.96	3.40	5.90





LAKWOOD OHIO **FLEET ANALYSIS & PLANNING**

Lakewood Fleet Vehicle Performance Averages

Vehicle Types	MPG		Annual Fuel Cost		Annual Miles
	Gasoline	Diesel	Gasoline	Diesel	Gasoline
SUV's	10.81	1.79	1,164	1,468	12,125
Refuse Automated	-	1.79	-	1,468	8,154
Refuse Rear Loaders	-	2.65	-	1,574	3,719
Heavy Trucks	-	4.05	-	677	2,242
Autos	13.74	4.05	408	433	3,328
Light Trucks	6.83	7.54	152	433	3,311
Pickups	8.54	-	566	-	4,936
Ambulances	-	1.32	-	1,053	1,054
Trucks	-	1.21	-	1,027	10,370
Vans	10.90	-	405	-	4,440
Transit Buses	6.11	-	690	-	3,640

Lakewood Alternative Fuel Vehicle Performance Analysis

Vehicle Type	Fuel Type	MPG	Annual Fuel Cost	Annual Miles
SUV's	Gasoline	10.81	1,164	12,125
	Biodiesel	10.81	1,164	12,125
Refuse Automated	Gasoline	-	-	-
	Biodiesel	-	-	-
Refuse Rear Loaders	Gasoline	-	-	-
	Biodiesel	-	-	-
Heavy Trucks	Gasoline	-	-	-
	Biodiesel	-	-	-
Autos	Gasoline	13.74	408	3,328
	Biodiesel	13.74	408	3,328
Light Trucks	Gasoline	6.83	152	3,311
	Biodiesel	6.83	152	3,311
Pickups	Gasoline	8.54	566	4,936
	Biodiesel	8.54	566	4,936
Ambulances	Gasoline	-	-	-
	Biodiesel	-	-	-
Trucks	Gasoline	-	-	-
	Biodiesel	-	-	-
Vans	Gasoline	10.90	405	4,440
	Biodiesel	10.90	405	4,440
Transit Buses	Gasoline	6.11	690	3,640
	Biodiesel	6.11	690	3,640

LAKWOOD OHIO **FLEET ANALYSIS & PLANNING**

Biodiesel Analysis

BIODIESEL (B10) AND DIESEL AVERAGE RETAIL PRICES BY REGION

Region	B10 Prices (\$/gal)	Diesel Prices (\$/gal)	Price Differential
Central Atlantic	\$2.26	\$2.58	-\$0.32
Lower Atlantic	\$2.31	\$2.49	-\$0.18
Midwest	\$2.40	\$2.44	-\$0.04

Key Recommendation: Adopt the Biodiesel 10 as Cost Effective for Fleet Operations

1. Based on current biodiesel savings, we recommend that the City explore biodiesel use in the near-term in diesel vehicles for cost-effectiveness and environmental benefit.

2. Current local biodiesel suppliers and ensure an efficient market exists locally. This requires a general release of liability and that any diesel use followed by any B10-B20 products for storage, handling, and distribution of the fuel.

36 Diesel Vehicles = 36% of Fleet

LAKWOOD OHIO **FLEET ANALYSIS & PLANNING**

Propane Analysis

Recommendation: Introduce Propane Vehicles for Select Vehicle Types

1. Based on current projections, we recommend the City introduce Propane vehicles as alternatives for diesel heavy duty, gas passenger car, and diesel medium duty vehicles.

2. Partner with local propane autogas suppliers to get low/no cost infrastructure to minimize City investment. However, based on current codes, no maintenance facility modifications or other investments will be needed to implement propane vehicles other than access to fueling.

LAKWOOD OHIO County of Franklin | FLEET ANALYSIS & PLANNING

Propane Analysis

Item	Current Vehicle	Propane Replacement
Base Cost	\$43,745	\$43,745
Incremental Cost		\$8,415
Avg. Fuel/Year	2,909	4,632
Annual Mileage	9,298	9,298
Maintenance Costs/Year	\$2,021	\$2,021

Fuel Price Projections: Reference/Median Oil Price Case

LAKWOOD OHIO County of Franklin | FLEET ANALYSIS & PLANNING

Threshold Analysis

of Units Eligible for Propane Replacement - 32

Threshold Analysis

- SUVs
- REFUSE AUTOMATED
- REFUSE REAR LOADERS
- HEAVY TRUCKS
- 1 TON TRUCKS (Diesel)
- Auto's

LAKWOOD OHIO County of Franklin | FLEET ANALYSIS & PLANNING

F/E-450-650

Item	Current Vehicle	Propane Replacement
Base Cost	\$43,745	\$43,745
Incremental Cost		\$8,415
Avg. Fuel/Year	2,909	4,632
Annual Mileage	9,298	9,298
Maintenance Costs/Year	\$2,021	\$2,021

F/E-150-350

Item	Current Vehicle	Propane Replacement
Base Cost	\$32,060	\$32,060
Incremental Cost		\$13,245
Avg. Fuel/Year	2,247	3,241
Annual Mileage	10,812	10,812
Maintenance Costs/Year	\$2,021	\$2,021

Item	F/E-450-650		F/E-150-350	
	Gas	Propane	Gas	Propane
Base Cost	\$77,795	\$77,795	\$64,120	\$64,120
Incremental Cost	\$0	\$8,415	\$13,245	\$0
Avg. Fuel/Year	\$1,350	\$1,350	\$1,350	\$1,350
Annual Mileage	9,298	9,298	10,812	10,812
Maintenance Costs/Year	\$4,042	\$4,042	\$4,042	\$4,042
Net Savings	\$10,750	\$10,750	\$12,990	\$12,990

LAKWOOD OHIO County of Franklin | FLEET ANALYSIS & PLANNING



Sedan / SUV / Mini Van

Item	Current Vehicle	Propane Replacement
Base Cost	\$20,000	\$20,000
Incremental Cost		\$7,500
Avg. Fuel/Year	1,818	2,281
Annual Mileage	21,797	21,797
Maintenance Costs/Year	\$2,021	\$2,021

Item	Sedan / SUV / Mini Van	
	Gas	Propane
Base Cost	\$20,000	\$20,000
Incremental Cost	\$0	\$7,500
Avg. Fuel/Year	\$1,350	\$1,350
Annual Mileage	9,298	9,298
Maintenance Costs/Year	\$4,042	\$4,042
Net Savings	\$4,712	\$4,712

LAKWOOD OHIO City of Lakewood **FLEET ANALYSIS & PLANNING**

Propane Station

Propane Station Estimate		Propane Station Estimate	
Station Capacity: 10,000 Annual 6000 Gallons		Station Capacity: 10,000 Gall/Year	
Total Design Costs	\$158.58	Total Design Costs	\$500
Total Equipment Costs	\$46,517.78	Total Equipment Costs (TKO) not tank + 1 dispenser	\$15,000
Total Construction Costs	\$2,662.25	Total Construction Costs	\$1,000
Total Propane Station Costs:	\$59,639.41	Total Propane Station Costs:	\$18,500

LAKWOOD OHIO City of Lakewood **FLEET ANALYSIS & PLANNING**

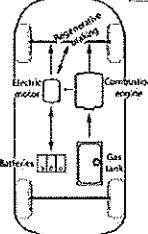
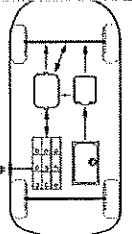
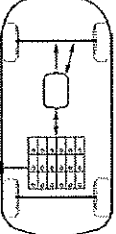
10 Total Investment

10 Year Total Investment ROI Scenarios - Propane	Low Oil Price	Median Oil Price	High Oil Price
Heavy Duty (2)	\$512,250	\$415,221	\$459,219
Passenger Car (1)	\$516,136	\$462,628	\$467,023
Medium Duty (2)	\$64,298	\$7,700	\$31,060
Station Cost	\$59,639	\$59,639	\$59,639
10 Year ROI	\$136,123	\$2,214	\$138,941

**No facilities modifications required – same standards as gasoline and diesel
 **No significant Technician Training required, similar to gas vehicle maintenance
 ***Station Costs can be significantly reduced – sometimes eliminated*

LAKWOOD OHIO City of Lakewood **FLEET ANALYSIS & PLANNING**

NEEDS ASSESSMENT FOR FLEET OPERATIONS

A. Hybrid vehicle
 B. Electric vehicle
 C. Battery vehicle

LAKWOOD OHIO City of Lakewood **FLEET ANALYSIS & PLANNING**

Gas/Electric Vehicle Comparisons Auto

Current Vehicle		Proposed Replacement	
Base Cost	\$10,000	Replacement Cost	\$1,700
Acq. Tax/Fee	\$25	Acq. Tax/Fee	\$25
Annual Mileage	4,219	Annual Mileage	4,219
Maintenance Cost/Ann	\$233	Maintenance Cost/Ann	\$233

Based on current projections, we recommend the City limit on Electric vehicles as alternatives for gas passenger vehicles.

	Low Oil Price		Median Oil Price		High Oil Price	
	Gas	Elec	Gas	Elec	Gas	Elec
DEM	\$1,286	\$643	\$1,276	\$643	\$1,286	\$643
Total	\$8,184	\$5,614	\$11,032	\$5,750	\$10,683	\$5,695
FCM (Elec)	\$757	\$0	\$757	\$0	\$757	\$0
Net Savings	\$1,070	\$5,714	\$2,518	\$5,750	\$2,169	\$5,695

LAKESWOOD OHIO **City of Lakewood** **FLEET ANALYSIS & PLANNING**

AC Level 1 Charging	AC Level 2 Charging	DC Fast Charging
2 to 8 miles of range per hour of charging	20 to 80 miles of range per hour of charging	50 to 70 miles of range per 20 minutes of charging
AC Level 1 EVSE (often referred to simply as Level 1) provides charging through a 120-volt (V) AC plug. Most, if not all, plug-in electric vehicles (EVs) will come with an AC Level 1 EVSE installed in the vehicle's charging equipment required.	AC Level 2 equipment (often referred to simply as Level 2) offers charging through 240 V. It is the standard equipment for all EVSE. The cost of commercial application electrical service, all necessary installation, and AC Level 2 charging equipment.	Direct-current (DC) fast charging equipment, sometimes called DC Level 3 typically 200-400V AC. When installed, enables rapid charging. There are three types of DC fast charging systems, depending on the type of charge port on the vehicle: a CHAdeMO, CCS, or Tesla.
Cost: \$10-\$200 Most facilities have level 1 units available, but only a few have level 2 units and installation are required.	Cost: \$1000-\$10,000 Cost of building, site-work or land, will mount at 200V level 2 chargers range \$1000. Federal installed level 2 chargers are for \$5,000+ range with variability based on charger features and cost electric service	Cost: \$10,000-\$40,000 Level 3 DC Fast Charging equipment is most expensive and requires an electrical service and wiring nearby to meet minimum standards of power available.

LAKESWOOD OHIO **City of Lakewood** **FLEET ANALYSIS & PLANNING**

Benefits of a Plug-in Hybrid Vehicle

XL plug-in.
XLP™ Plug-in Hybrid Electric Solution

Efficiency Solutions

DERIVE SYSTEMS

DERIVE Efficiency

INCREASE YOUR FUEL EFFICIENCY UP TO 12%

The GRIP System

The GRIP Idle Management System (Governor to Reduce Idle & Pollution) manages and reduces the time a vehicle spends idling.

When a vehicle is idling and in PARK, GRIP transfers operation from the engine to the battery. GRIP works with the vehicle's Controller Area Network (CAN) making decisions to shut the engine off - it can turn engine on to recharge the batteries as needed.

Benefits of Using GRIP

- Reduced engine idling
- Reducing pollution
- Reduced maintenance required on engine and systems due to parts wear
- Able to maintain interior comfort
- Able to decrease operation of lights and auxiliary equipment

Ohio Grant Opportunities FY2017/2018

Ohio EPA Rural Transit Reduction Grant (DER2)	Ohio EPA Alternative Fuel Vehicle Grant Program
Funding Level: \$1 million available per year	Funding Level: \$1,000,000 in total per year
Program Parameters: Eligible entities include all public transit agencies that provide a public transit service to the public. Entities must be quality and financially sound. The program is designed to fund vehicles, equipment, and maintenance of public transit and equipment. Also, it is designed to cover the purchase, lease, or rental of alternative fuel vehicles. Applicants must submit a detailed proposal to the grant administrator by the end of the 2017 calendar year.	Program Parameters: Eligible entities include all public transit agencies that provide a public transit service to the public. Entities must be quality and financially sound. The program is designed to fund vehicles, equipment, and maintenance of public transit and equipment. Also, it is designed to cover the purchase, lease, or rental of alternative fuel vehicles. Applicants must submit a detailed proposal to the grant administrator by the end of the 2017 calendar year.
Submission Instructions: Grant applications are made by submitting applications to the grant administrator by the end of the 2017 calendar year. Grant applications are made by submitting applications to the grant administrator by the end of the 2017 calendar year.	Submission Instructions: Grant applications are made by submitting applications to the grant administrator by the end of the 2017 calendar year. Grant applications are made by submitting applications to the grant administrator by the end of the 2017 calendar year.
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FLEET ANALYSIS & PLANNING

<p>CNG STATION - SMALL FAST-FILL</p> <ul style="list-style-type: none"> Capacity: 3 - 10 vehicles at once (20,000-60000 gpa) Design: \$15,000 - \$30,000 Equipment: \$40,000 - \$100,000+ Construction: \$70,000 - \$150,000+ Total Cost: \$175,000 - \$280,000+ 	<p>CNG STATION - MEDIUM FAST-FILL</p> <ul style="list-style-type: none"> Capacity: 4-6 vehicles at once (20,000-60000 gpa) Design: \$15,000 - \$30,000 Equipment: \$50,000 - \$150,000+ Construction: \$100,000 - \$150,000+ Total Cost: \$180,000 - \$230,000+ 	<p>CNG STATION - LARGE FAST-FILL</p> <ul style="list-style-type: none"> Capacity: 8 - 12+ vehicles at once (20,000-60000 gpa) Design: \$25,000 - \$50,000+ Equipment: \$75,000 - \$150,000+ Construction: \$150,000 - \$200,000+ Total Cost: \$250,000 - \$325,000+
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- *Facilities modifications required -- Codes Different from gasoline and diesel
- **Significant Technician Training required, different from liquid fuel vehicle maintenance
- ***Station Costs can be significantly HIGH



FLEET ANALYSIS & PLANNING

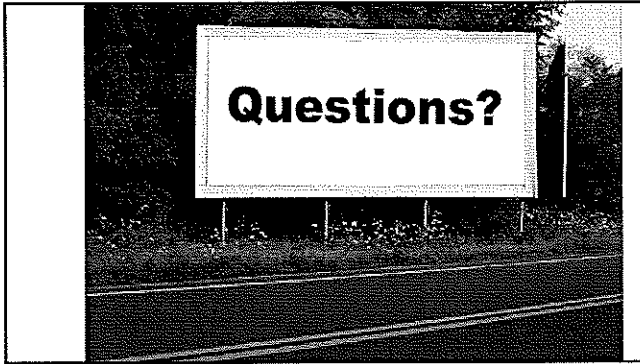
10 Total Investment

	10 Year Total Investment (CNG) - Gasoline: CNG		
	Low Oil Price	Median Oil Price	High Oil Price
Station Cost (3)	\$45,000	\$57,261	\$245,022
Parking Lot (3)	\$52,554	\$19,770	\$104,316
Medium Duty (2)	\$18,574	\$9,418	\$47,648
** Station Cost	\$116,128	\$86,449	\$197,000
** Maintenance Upgrade	\$5390,000	\$3,810,000	\$5,530,000
Ten Year ROI	\$1,918,877	\$1,769,151	\$1,452,518

10 Year Total Investment (CNG) - Gasoline: CNG

Based on current projections, we recommend the City introduce CNG vehicles as alternatives for all mid to heavy duty, garbage trucks, and other medium duty vehicles.

Consider options to get low-noise and low-pollution to minimize City investment. Based on current codes, maintenance facility modifications and other investments will be needed to implement CNG vehicles other than those to be used.



LAKWOOD OHIO **FLEET ANALYSIS & PLANNING**

Ethanol Analysis

Fuel Price Projections: Reference/Median Oil Price Case 1

Region	EDI Price	Gasoline Price	Price
Central Atlantic	\$1.25	\$2.28	\$1.03
Lower Midwest	\$1.09	\$2.24	\$2.21
Plymouth	\$1.55	\$2.74	\$1.18

Key Assumptions of Analysis: based on total ethanol blend E85 (50% Ethanol/50% Gasoline)

Long-Term, driving a decision matrix by different blend ratios is not recommended. Ethanol E85 has 20-25% less energy per gallon. Fleet should begin to prepare more fuel efficient and use E85 when the price per gallon is 25% or more below the current cost of gasoline for fleet operations.

LAKWOOD OHIO **FLEET ANALYSIS & PLANNING**

Compressed Natural Gas (CNG)

Fuel Price Projections: Reference/Median Oil Price Case 1

Region	EDI Price	Gasoline Price	Price
Central Atlantic	\$1.25	\$2.28	\$1.03
Lower Midwest	\$1.09	\$2.24	\$2.21
Plymouth	\$1.55	\$2.74	\$1.18

Key Assumptions of Analysis: based on total ethanol blend E85 (50% Ethanol/50% Gasoline)

Long-Term, driving a decision matrix by different blend ratios is not recommended. Ethanol E85 has 20-25% less energy per gallon. Fleet should begin to prepare more fuel efficient and use E85 when the price per gallon is 25% or more below the current cost of gasoline for fleet operations.

LAKWOOD OHIO **FLEET ANALYSIS & PLANNING**

Threshold Analysis

of Units Eligible for CNG Replacement - 51

- 5 SUV's
- 17 REFLINE AUTOMATED
- 8 REFLINE REAR LOADERS
- HEAVY TRUCKS
- AUTO 4
- 1 TON TRUCKS (Diesel)
- 1 VANS