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Section 1: Introduction

To support the City's sustainability goals, the Equipment Management Division (EMD) seeks to improve air quality, reduce dependence on foreign oil, reduce environmental impact, control costs, and reduce fleet emissions. The City of Tulsa's Green Fleet Action Plan (GFAP) addresses the management, operation and procurement of vehicles and equipment in order to improve energy efficiency, reduce emissions, and control costs. This is a plan for greening the city's fleet, with most targets and goals extending through 2020.

Tulsa strives to be a front-runner in "greening" the environment. The past several years have yielded significant accomplishments toward this end goal, including:

- Honored in 2016 as the #13 Greenest Fleet in North America by the 100 Best Fleets Organization (4th consecutive year to be recognized as a top 50 green fleet).
- Honored in 2016 as the #4 Leading Fleet in North America by Government Fleet Magazine and the American Public Works Association.
- Recognized as a "Fleet Masters Operation" by the Government Fleet Management Alliance (GFMA).
- Attained Clean Fleet Certification (CFC) in 2016 through the Coalition for Green Fleet Management.
- Recognized in 2015 as a Certified Fleet Management Operation (CFMO) by the Government Fleet Management Alliance (GFMA). The CFMO process helped EMD improve its effectiveness, competitiveness, and efficiency.
- Member of the Tulsa Area Clean Cities Coalition.
- Annually participate in the Indian Nations Council of Governments (INCOG) Ozone Alert! Program and serve as an Ozone Ambassador.
- Technicians are certified with the Oklahoma Department of Labor to maintain and repair the City's CNG vehicles and infrastructure.
- Opened first public Compressed Natural Gas (CNG) fast-fill fueling station in 2012, and will open second public CNG fast-fill fueling station in early-2017.
- Awarded 2016 Clean Cities grant to install Electric Vehicle (EV) charging stations in Tulsa's downtown corridor for public use.
- Started the Oklahoma Public Fleet Management Association (OPFMA) in 2013 to promote fleet best practices and clean fleet initiatives among Oklahoma's government fleet professionals.
- During the past six years, the EMD has obtained six grants and two donations totaling nearly $500,000 for alternative fueled vehicles and infrastructure.
- The EMD recycles used oil in its waste oil heaters to heat shops during the winter.
- All EMD shops are designated as active recycling sites (ARS). Employees annually train to properly recycle metals, antifreeze, batteries, oils, tires, shipping materials, plastics, paper, aluminum, oil filters, and office products.

Section 2: Tulsa Facts

FLEET COUNT AND FUEL CONSUMPTION

The City of Tulsa Equipment Management Division (EMD) maintains over 3,300 pieces of equipment.

✓ Approximately 2,500 are on-road vehicles (cars, trucks, SUVs, etc.).

✓ Approximately 800 are off-road units (loaders, dozers, trailers, etc.). Of these, about 300 are petroleum fueled units.

Including public CNG sales, 2.15 million gallons of fuel were consumed in 2016. See Chart 1 for fuel breakdown.

Chart 1 – 2016 Fuel Consumption
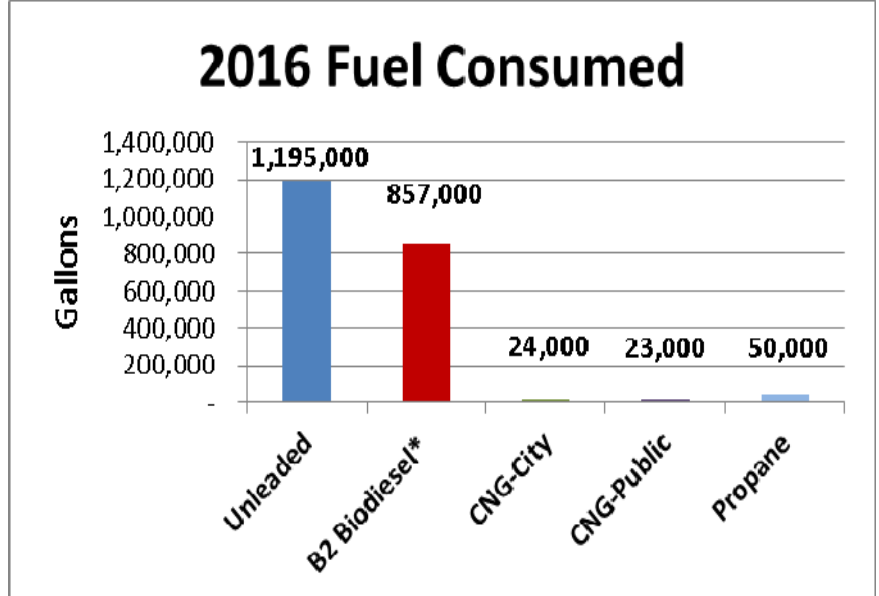
*B2 = 2% biodiesel and 98% diesel; the bio portion of 857,000 gallons = 17,140 gallons

CARBON FOOTPRINT

EMD's Fleet Utilization Scoring System (FUSS) calculates the carbon footprint of the City's fleet. Carbon footprint is the amount of carbon dioxide and other carbon compounds emitted due to the consumption of fossil fuels. According to the most recent FUSS Report (dated July 2016), the City's fleet annually emits approximately 20,000 tons of harmful carbon emissions.

ALTERNATIVE FUELS INFRASTRUCTURE AND PRODUCTS

The EMD operates three CNG stations. One of the stations is a CNG time-fill fueling station to fuel green waste collection trucks, the second is a CNG fast-fill fueling station to fuel light duty vehicles, and the third is a public-only CNG fast-fill fueling station. By May 2017, the City will open a fourth CNG fast-fill fueling station for City and public vehicles.

During 2016, the City's CNG stations displaced 47,000 petroleum gallons (24,000 GGEs from City vehicles and 23,000 GGEs from public vehicles) and reduced harmful carbon dioxide (CO2) emissions in Tulsa's air-shed by approximately 118 tons. Reducing carbon emissions by 118 tons is equivalent to removing 23 passenger vehicles from the road. During 2017, the City's CNG stations (3 opened prior to 2013, and 1 that will open early-2017) are expected to displace between 150,000 and 200,000 petroleum gallons. This will result in carbon emissions reductions of 437 tons which is equivalent to removing 84 passenger vehicles from the road. Source: https://www.epa.gov/energy/ghg-equivalencies-calculator-calculations-and-references

During 2016, the City used approximately 50,000 gallons of propane to fuel generators and small off-road equipment (e.g. forklifts, hotboxes). The City also purchased 857,000 gallons of biodiesel (B2 blend) to fuel its diesel fleet.

ALTERNATIVE FUELED VEHICLES (AFVs)

The City's Alternative Fueled Vehicle (AFV) fleet is comprised of 53 CNG vehicles, 120 hybrid vehicles, 380 flex fuel vehicles, and 15 propane units.

Table 1 provides detailed AFV data. During 2016, the City's flex fuel vehicles were fueled with E10 gas instead of flex fuel (E85). During 2017, the EMD will determine the viability of purchasing E85 for these units. The EMD is proposing a pilot program to test E85 on a select number of vehicles. The pilot would compare E85 fueled units to E10 fueled units and measure differences in fuel efficiency, fuel costs, and maintenance costs.

Table 1 – AFV Fleet (by Fleet Type)

#	AFV Description	# of AFVs
1	CNG - Ford Ranger Pickup	14
2	CNG - Crane Carrier Trash Truck	6
3	CNG - Ford F150, F250 & F350 Bi-Fuel Pickup	15
4	CNG - Chevrolet Impala Bi-Fuel	1
5	CNG - Honda Civic GX	18
6	Hybrid - Honda Civic	11
7	Hybrid - Toyota Prius	5
8	Hybrid - Ford Escape SUV	75
9	Hybrid - Chevrolet Silverado Pickup	28
10	Flex Fuel – Ford Models	274
11	Flex Fuel – Chevrolet Models	104
12	Flex Fuel – Other Models	2
13	Propane Units	15
14	**TOTALS**	**568**

Section 3: Green Objectives 2017-2020

1.Reduce Petroleum Use and Carbon Emissions in the Light Duty Fleet

The City's light duty fleet is comprised of 749 marked units, 539 trucks, 287 automobiles, 197 sport utility vehicles, 40 vans, and 21 motorcycles (see Chart 2).

During 2016, the light duty fleet consumed 1,150,000 gallons of unleaded fuel, 100,000 gallons of diesel fuel, and 22,000 gasoline gallon equivalents (GGEs) of Compressed Natural Gas (CNG). This translates to an annual carbon footprint of approximately 11,000 tons.

Table 2 identifies fuel and emissions reduction goals for the light duty fleet (2017 through 2020).

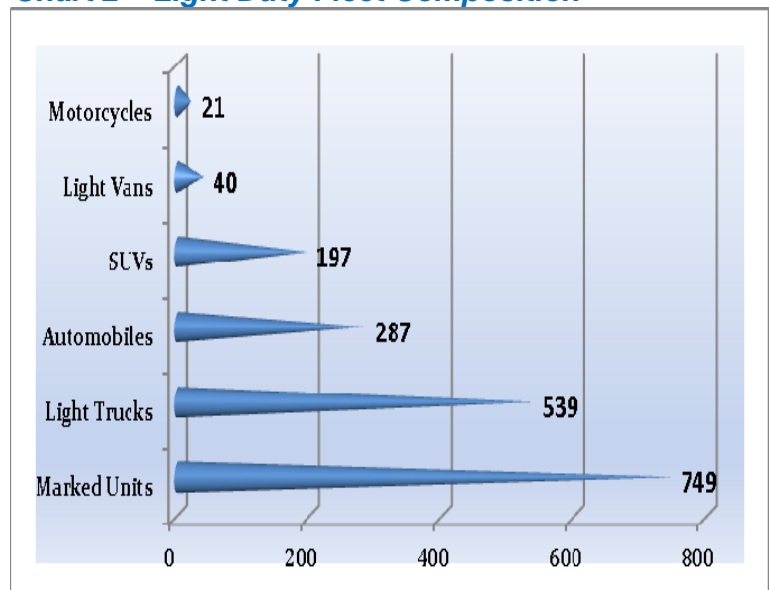*Chart 2 – Light Duty Fleet Composition*

Table 2 – Light Duty (LD) Fleet: Fuel and Emissions Reduction Goals (2017 through 2020)

| #	TARGET	2017 Goal	2018 Goal	2019 Goal	2020 Goal	4-Year Goal
1	Reduce unleaded consumption by 200,000 gallons by the end of 2020 (see Chart 3)	Reduce 25,000 gallons	Reduce 45,000 gallons	Reduce 55,000 gallons	Reduce 75,000 gallons	Reduce 200,000 gallons
2	Reduce diesel consumption by 25,000 gallons by the end of 2020 (see Chart 4)	Reduce 5,000 gallons	Reduce 5,000 gallons	Reduce 7,500 gallons	Reduce 7,500 gallons	Reduce 25,000 gallons
3	Replace 50 petroleum fueled automobiles with zero-emissions vehicles (ZEVs) by the end of 2020	10 ZEVs	10 ZEVs	15 ZEVs	15 ZEVs	50 ZEVs
4	Install 50 Electric Vehicle (EV) charging stations to recharge 50 ZEVs by the end of 2020	10 EV Charging Stations	10 EV Charging Stations	15 EV Charging Stations	15 EV Charging Stations	50 EV Charging Stations
5	Replace 35 petroleum fueled trucks with CNG trucks by the end of 2020	5 CNG Trucks	10 CNG Trucks	10 CNG Trucks	10 CNG Trucks	35 CNG Trucks
6	Replace 50 petroleum fueled vehicles with units that achieve 25-30 mpg (highway) or better by the end of 2020	5 Units	10 Units	15 Units	20 Units	50 Units
7	Increase CNG consumption to 40,000 GGEs by the end of 2020	2,000 GGE Increase	8,000 GGE Increase	15,000 GGE Increase	15,000 GGE Increase	40,000 GGE Increase
8	Reduce annual carbon emissions from 11,000 tons to 10,000 tons by end of 2020. This is the equivalent of removing 192 passenger vehicles from the road	Reduce by 100 tons	Reduce by 200 tons	Reduce by 300 tons	Reduce by 400 tons	Reduce by 1,000 tons

Chart 3 – Unleaded Reduction Goals (LD Fleet)
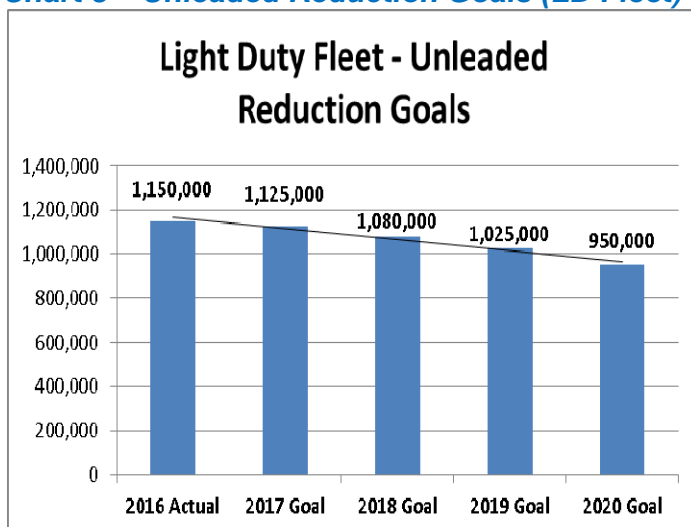
Chart 4 – Diesel Reduction Goals (LD Fleet)
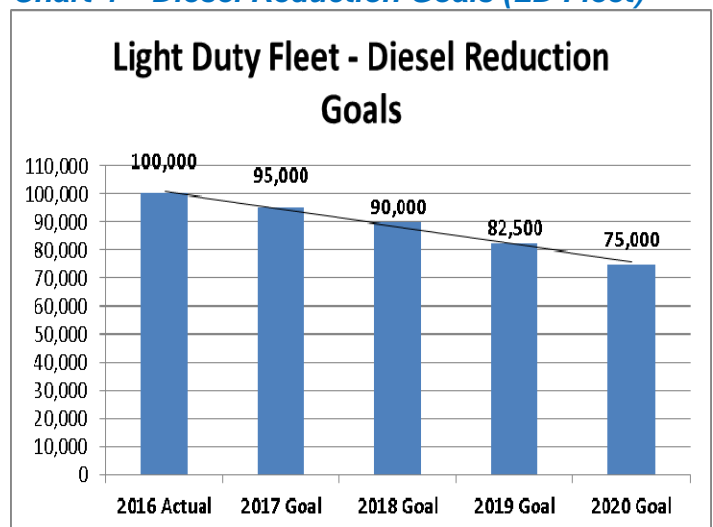
Steps to Accomplish Reduction Goals (Light Duty Fleet):

1. When automobiles used for in-town travel reach the replacement threshold, they should be replaced with zero-emissions vehicles (ZEV). ZEV is a vehicle that emits no tailpipe pollutants from the onboard source of power (Plug-In Hybrids, Fuel Cell Vehicles, Battery Electric Vehicles – see Chart 5).

   a. During 2017, the EMD will ask the Mayor and Fleet Management Steering Committee (FMSC) to consider an executive order that mandates replacement of eligible automobiles with ZEVs. Exceptions would require a written explanation and authorization from the appointing authority that operates the vehicle and from the FMSC.

   b. During 2017 through 2020, the EMD and City Purchasing will solicit bids to replace petroleum fueled automobiles with ZEVs.

   c. During 2017 through 2020, the EMD will notify departments which automobiles can be replaced with ZEVs, and will help them acquire replacement funding.

Table 3 – Zero Emission Vehicles (ZEV)

Plug-in Hybrid e.g. Chevrolet Volt	Fuel Cell Vehicle e.g. Toyota Mirai	Battery Electric Vehicle e.g. Nissan Leaf
A plug-in hybrid electric vehicle (PHEV) is a hybrid electric vehicle that uses rechargeable batteries, or another energy storage device, that can be recharged by plugging it into an external source of electric power.	A fuel cell vehicle (FCV) or fuel cell electric vehicle (FCEV) uses a fuel cell instead of a battery or in combination with a battery or supercapacitor, to power it's on board electric motor.	A battery electric vehicle (BEV), battery only electric vehicle (BOEV) uses chemical energy stored in rechargeable battery packs.

2. Utilize short term capital funds and grant funds to purchase and install Electric Vehicle (EV) charging stations to recharge City vehicles.

   a. During 2017, the EMD will collaborate with Indian Nations Council of Governments (INCOG) staff to determine what type of EV charging stations are needed (Level 1, Level 2, DC Fast Chargers); quantities needed, and appropriate locations to install the units.

   b. During 2017 through 2020, the EMD and City Purchasing will solicit bids to purchase and install EV charging stations.

   c. During 2017 through 2020, the EMD will apply for grant funding and request short term capital funding to acquire and install EV charging stations.

3. Utilize short term capital funds and grant funds to purchase and install Compressed Natural Gas (CNG) infrastructure.

   a. The EMD will open its fourth CNG station by May 2017. The station will be open 7 days per week, 24 hours per day, and will accept all major credit and fleet cards. The new station will fuel City vehicles, Tulsa transit buses, and public vehicles. The new station will increase the City's annual CNG fueling capacity from 250,000 GGEs to 700,000 GGEs.

   b. Consider switching the City's CNG stations to Renewable Natural Gas (RNG). This would make CNG pumped through the City's stations mostly carbon neutral, and might also lower the City's price per GGE. This is potentially an easy and very low cost method to significantly reduce the City's carbon footprint.

   c. During 2017 through 2020, the EMD will apply for grant funding and request short term capital funding to acquire and install CNG infrastructure.

4. When light duty vans, sport utility vehicles, and light duty trucks reach the threshold for replacement, they should be replaced with one of the following green fleet alternatives: dedicated or bi-fuel Compressed Natural Gas (CNG), hybrid, electric, flex-fuel, or petroleum fueled units with a fuel efficiency rating of 25-30 MPG (Highway) or better.

   a. During 2017, the EMD will ask the Mayor and Fleet Management Steering Committee (FMSC) to consider an executive order that mandates replacement eligible vans, trucks and SUV's be replaced with one of the green fleet alternatives mentioned above. Exceptions would require a written explanation and authorization from the appointing authority that operates the vehicle and from the FMSC.

   b. During 2017 through 2020, the EMD and City Purchasing will solicit bids to replace vans, trucks and sport utility vehicles with one of the green fleet alternatives mentioned above.

   c. During 2017 through 2020, the EMD will notify departments which units can be replaced with one of the green fleet alternatives mentioned above, and will help them acquire replacement funding.

5. Explore the possibility of installing anti-idling technology in light duty vehicles. The City of Columbus Ohio is utilizing the GRIP Idle Management System and Espar heater to reduce fuel consumption and costs by over $1 million per year. The GRIP system automatically turns off the engine once idling exceeds a preprogrammed amount of time while powering all auxiliary equipment as if the engine were running. Sensors are placed in vehicles to maintain a constant temperature regardless of the climate.

   a. During 2017, the EMD and FMSC will determine the feasibility of implementing this technology in Tulsa's fleet.

   b. (If feasible) During 2017 through 2020, the EMD and FMSC will determine which units can be outfitted with this technology.

   c. (If feasible) During 2017 through 2020, the EMD and Purchasing will solicit bids to purchase anti-idling equipment and outfit units with this technology.

   d. (If feasible) During 2017 through 2020, the EMD will help departments acquire funding to purchase anti-idling equipment and outfit units with this technology.

6. Utilize GPS and AVL telematics to help reduce idling, reduce driving time, plan more efficient routes, and eliminate wasteful driving habits (like speeding and unauthorized use). $750,000 is already budgeted for this initiative.

    a. During 2017, the EMD and FMSC will determine how this technology should be implemented in Tulsa's fleet.

    b. During 2017 through 2020, the EMD and FMSC will determine which units should be outfitted with this technology.

    c. During 2017 through 2020, the EMD and Purchasing will solicit bids to purchase GPS/AVL telematics and outfit units with this technology.

    d. During 2017 through 2020, the EMD will help departments utilize existing funds and acquire new funds to purchase GPS/AVL telematics and outfit units with this technology.

7. During 2017 through 2020, the EMD will promote ride sharing, the AFV motor pool fleet, and other petroleum reduction strategies through its website, special communiques, and through video and other electronic mediums.

8. During 2017 through 2020, the EMD will annually produce a Fleet Utilization Scoring System (FUSS) to identify which vehicles should be replaced. The FUSS will identify which vehicles are the oldest in the fleet, cost the most money to repair, consume the most fuel, achieve the worst fuel efficiency, and produce the greatest CO_2 emissions.

9. During 2017, the EMD will consider testing E85 for its flex fuel fleet. The EMD is proposing a pilot program to test E85 on a select number of vehicles. The pilot would compare E85 fueled units to E10 fueled units and measure differences in fuel efficiency, fuel costs, and maintenance costs. E85 is sold at a particular convenience store in Tulsa. Indian Nations Council of Governments (INCOG) staff can put us in contact with the convenience store's alternative fuels manager who might be able to provide the City of Tulsa with a fleet discount.

10. During 2017 through 2020, the EMD will consider increasing its B2 biodiesel blend to B5 or higher.

11. During 2017 through 2020, the EMD and FMSC will collaborate with City departments to right-size vehicles for their intended purpose. Reducing vehicle sizes where possible will lead to reduced fuel usage.

12. During 2017 through 2020, the EMD will promote the use of AFVs for out of town trips. The EMD provides a bi-fuel CNG Impala for departments to utilize for out of town trips. This past summer, an EMD employee drove this vehicle to the Government Fleet Expo in Nashville, TN using only CNG. The employee was able to access CNG stations along the way to refill the vehicle with CNG. The City also owns several bi-fuel Ford pickups that could be used for out of town trips.

2.Reduce Petroleum Use and Carbon Emissions in the Medium/Heavy Duty Fleet

The City's medium/heavy duty fleet is comprised of 362 heavy trucks, 174 medium trucks, 64 medium and heavy vans, and 54 fire trucks (see Chart 5).

During 2016, the medium/heavy duty fleet consumed 44,500 gallons of unleaded fuel, 705,000 gallons of diesel fuel, and 2,000 GGEs of CNG. This translates to an annual carbon footprint of approximately 9,000 tons. Table 3 identifies fuel and emissions reduction goals for the medium and heavy duty fleet (2017 through 2020).

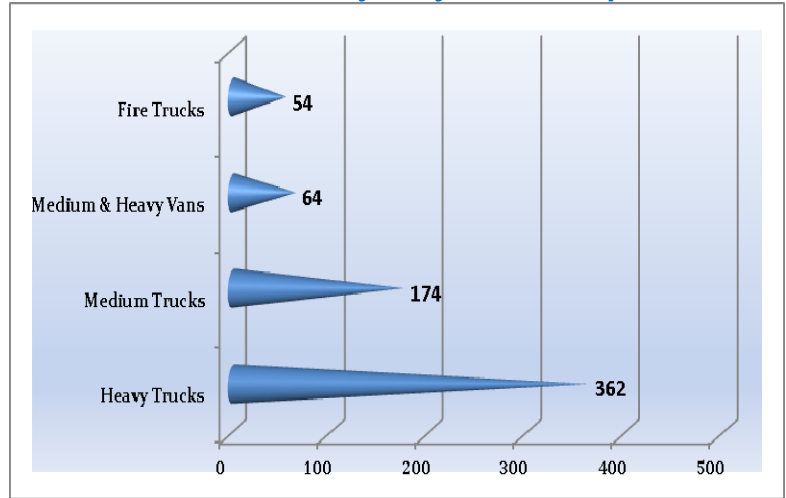*Chart 5 – Medium/Heavy Duty Fleet Composition*

Table 4 – Medium & Heavy Duty Fleet: Fuel and Emissions Reduction Goals (2017 through 2020)

| #	TARGET	2017 Goal	2018 Goal	2019 Goal	2020 Goal	4-Year Goal
1	Reduce unleaded consumption by 10,000 gallons by the end of 2020 (see Chart 7)	Reduce 1,000 gallons	Reduce 2,000 gallons	Reduce 3,000 gallons	Reduce 4,000 gallons	Reduce 10,000 gallons
2	Reduce diesel consumption by 125,000 gallons by the end of 2020 (see Chart 8)	Reduce 15,000 gallons	Reduce 25,000 gallons	Reduce 35,000 gallons	Reduce 50,000 gallons	Reduce 125,000 gallons
3	Replace 15 diesel fueled trucks with CNG trucks by the end of 2020	2 CNG Trucks	3 CNG Trucks	5 CNG Trucks	5 CNG Trucks	15 CNG Trucks
4	Increase B5 biodiesel consumption from 0 to 250,000 gallons by the end of 2020 (we are currently using B2 biodiesel)	Increase from 0 to 50,000 gallons	Increase from 50,000 to 125,000 gallons	Increase from 125,000 to 200,000 gallons	Increase from 200,000 to 250,000 gallons	Increase from 0 to 250,000 gallons
5	Increase CNG consumption from 2,000 GGEs to 20,000 GGEs by the end of 2020	Increase from 2,000 to 3,000 GGEs	Increase from 3,000 to 8,000 GGEs	Increase from 8,000 to 14,000 GGEs	Increase from 14,000 to 20,000 GGEs	Increase from 2,000 to 20,000 GGEs
6	Reduce annual carbon emissions from 9,000 tons to 8,000 tons by end of 2020. This is the equivalent of removing 192 passenger vehicles from the road	Reduce by 100 tons	Reduce by 200 tons	Reduce by 300 tons	Reduce by 400 tons	Reduce by 1,000 tons
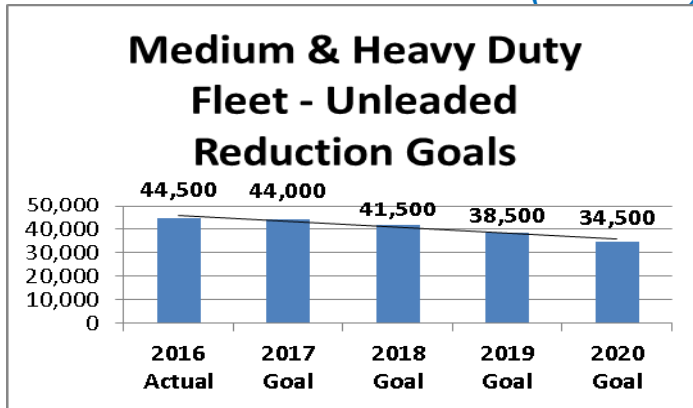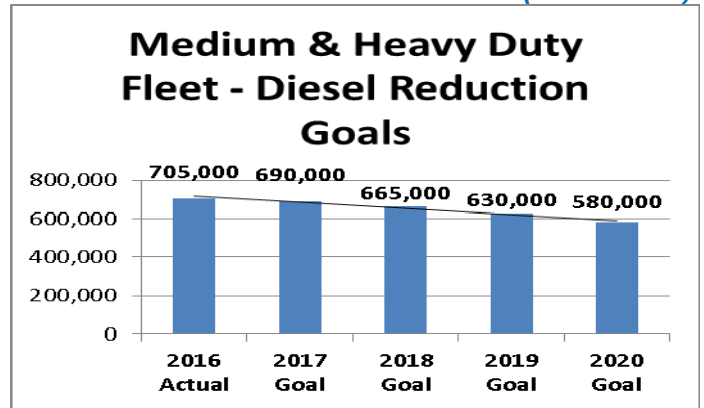
Steps to Accomplish Reduction Goals (Medium & Heavy Duty Fleet):

1. Excluding fire trucks, when medium and heavy duty trucks reach the threshold for replacement, they should be replaced with one of the following green fleet alternatives: dedicated or bi-fuel Compressed Natural Gas (CNG), hybrid, electric or new generation clean diesel trucks that have near zero particulate emissions.

    a. During 2017, the EMD will ask the Mayor and Fleet Management Steering Committee (FMSC) to consider an executive order that mandates replacement of eligible trucks with one of the green fleet alternatives mentioned above. Exceptions would require a written explanation and authorization from the appointing authority that operates the vehicle and from the FMSC.

    b. During 2017 through 2020, the EMD and City Purchasing will solicit bids to replace vans, trucks and sport utility vehicles with one of the green fleet alternatives mentioned above.

    c. During 2017 through 2020, the EMD will notify departments which units can be replaced with one of the green fleet alternatives mentioned above, and will help them acquire replacement funding.

2. Explore the possibility of installing anti-idling technology in medium and heavy duty vehicles. The City of Columbus Ohio is utilizing the GRIP Idle Management System and Espar heater to reduce fuel consumption and costs by over $1 million per year. The GRIP system automatically turns off the engine once idling exceeds a preprogrammed amount of time while powering all auxiliary equipment as if the engine were running. Sensors are placed in vehicles to maintain a constant temperature regardless of the climate.

    a. During 2017, the EMD and FMSC will determine the feasibility of implementing this technology in Tulsa's fleet.

    b. (If feasible) During 2017 through 2020, the EMD and FMSC will determine which units can be outfitted with this technology.

    c. (If feasible) During 2017 through 2020, the EMD and Purchasing will solicit bids to purchase anti-idling equipment and outfit units with this technology.

    d. (If feasible) During 2017 through 2020, the EMD will help departments acquire funding to purchase anti-idling equipment and outfit units with this technology.

3. Utilize GPS and AVL telematics to help reduce idling, reduce driving time, plan more efficient routes, and eliminate wasteful driving habits (like speeding and unauthorized use). $750,000 is already budgeted for this initiative.

    a. During 2017, the EMD and FMSC will determine how this technology should be implemented in Tulsa's fleet.

    b. During 2017 through 2020, the EMD and FMSC will determine which units should be outfitted with this technology.

    c. During 2017 through 2020, the EMD and Purchasing will solicit bids to purchase GPS/AVL telematics and outfit units with this technology.

    d. During 2017 through 2020, the EMD will help departments utilize existing funds and acquire new funds to purchase GPS/AVL telematics and outfit units with this technology.

4. Utilize short term capital funds and grant funds to purchase and install Compressed Natural Gas (CNG) infrastructure.

    a. The EMD will open its fourth CNG station in early-2017. The station will be open 7 days per week, 24 hours per day, and will accept all major credit and fueling cards. The new station will fuel City vehicles, Tulsa transit buses, and public vehicles. The new station will increase the City's annual CNG fueling capacity from 250,000 GGEs to 700,000 GGEs.

    b. Consider switching the City's CNG stations to Renewable Natural Gas (RNG). This would make CNG pumped through the City's stations mostly carbon neutral, and might also lower the City's price per GGE. This is potentially an easy and very low cost method to significantly reduce the City's carbon footprint.

    c. During 2017 through 2020, the EMD will apply for grant funding and request short term capital funding to acquire and install CNG infrastructure.

5. During 2017 through 2020, the EMD will promote petroleum reduction strategies through its website, special communiques, and through video and other electronic mediums.

6. During 2017 through 2020, the EMD will annually produce a Fleet Utilization Scoring System (FUSS) to identify which vehicles should be replaced. The FUSS will identify which vehicles are the oldest in the fleet, cost the most money to repair, consume the most fuel, achieve the worst fuel efficiency, and produce the greatest CO_2 emissions.

7. During 2017 through 2020, the EMD will consider increasing its biodiesel blend from B2 to B5. B5 (5% biodiesel, 95% petroleum diesel) can be used in any diesel engine.

8. During 2017 through 2020, the EMD will explore the use of B20. The EMD must determine if the City's diesel engines are certified for use with B20 (20% biodiesel, 80% petroleum diesel). Significant reductions of PM, CO, and hydro-carbon emissions can be achieved with B20 blends.

9. During 2017 through 2020, the EMD and FMSC will collaborate with City departments to right-size vehicles for their intended purpose. Reducing vehicle sizes and weights where possible will lead to reduced fuel usage.

10. Explore the use of micro-turbines. A micro-turbine acts as an auxiliary power unit (APU) in series hybrid vehicles. The micro-turbine charges the batteries, which in turn power the electric motor that drives the wheels of the vehicle. The micro-turbine can be fueled with natural gas, biodiesel, or diesel. A micro-turbine expands a vehicle's range while providing added power for auxiliary loads (e.g., air conditioning and heat), thus reducing engine wear, fuel use, and emissions.

11. Install particulate filters and diesel oxidation catalysts (DOCs) on older model diesel trucks. Particulate filters are capable of capturing up to 95 percent of particulate matter or soot. DOCs are similar to converters installed on light duty vehicles. DOCs are capable of eliminating particulate matter by 20-50 percent.

    a. During 2017 through 2020, the EMD will determine which units should be outfitted with this technology.

    b. During 2017 through 2020, the EMD and Purchasing will obtain quotes and/or solicit bids to purchase particulate filters and DOC's to outfit units with this technology.

    c. During 2017 through 2020, the EMD will help departments utilize existing funds and acquire new funds to purchase particulate filters and DOC's and outfit units with this technology.

3. Reduce Petroleum Use and Carbon Emissions in the Off-Road Fleet

The City's Off-Road fleet is comprised of approximately 800 units (e.g. forklifts, tractors, dozers, mowers, loaders). Of these, approximately 300 are petroleum fueled units. During 2016, the Off-Road fleet consumed 500 gallons of unleaded fuel, 52,000 gallons of diesel fuel, and 50,000 gallons of Propane. This translates to an annual carbon footprint of approximately 800 tons. Table 5 identifies fuel and emissions reduction goals for the off-road fleet (2017 through 2020).

Table 5 – Off-Road Fleet: Fuel and Emissions Reduction Goals (2017 through 2020)

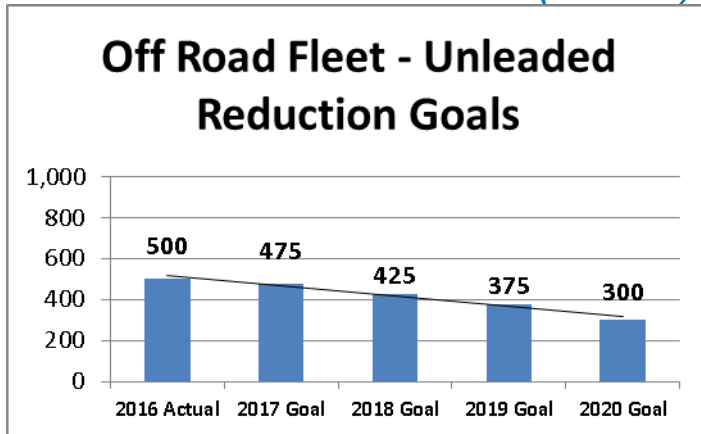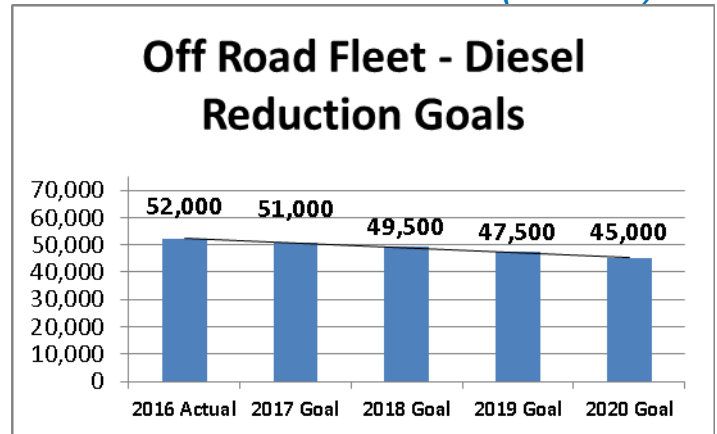| #	TARGET	2017 Goal	2018 Goal	2019 Goal	2020 Goal	4-Year Goal
1	Reduce unleaded consumption by 200 gallons by the end of 2020 (Chart 8)	Reduce 25 gallons	Reduce 50 gallons	Reduce 50 gallons	Reduce 75 gallons	Reduce 200 gallons
2	Reduce diesel consumption by 7,000 gallons by end of 2020 (Chart 9)	Reduce 1,000 gallons	Reduce 1,500 gallons	Reduce 2,000 gallons	Reduce 2,500 gallons	Reduce 7,000 gallons
3	Replace 50 petroleum fueled units with Propane or Electric units by the end of 2020	5 Alt Fuel Units	10 Alt Fuel Units	15 Alt Fuel Units	20 Alt Fuel Units	50 Alt Fuel Units
4	Increase Propane consumption from 50,000 to 75,000 gallons by end of 2020	Increase from 50,000 to 55,000 gallons	Increase from 55,000 to 60,000 gallons	Increase from 60,000 to 65,000 gallons	Increase from 65,000 to 75,000 gallons	Increase from 50,000 to 75,000 gallons
5	Reduce annual carbon emissions from 800 tons to 650 tons by end of 2020. This equals removing 28 passenger vehicles from the road.	Reduce by 15 tons	Reduce by 25 tons	Reduce by 50 tons	Reduce by 60 tons	Reduce by 150 tons

Off Road Fleet - Unleaded Reduction Goals

	2016 Actual	2017 Goal	2018 Goal	2019 Goal	2020 Goal
	500	475	425	375	300

Off Road Fleet - Diesel Reduction Goals

	2016 Actual	2017 Goal	2018 Goal	2019 Goal	2020 Goal
	52,000	51,000	49,500	47,500	45,000

Steps to Accomplish Reduction Goals (Off-Road Fleet):

1. When off-road units reach the threshold for replacement, they should be replaced with one of the following green fleet alternatives: Propane, hybrid, electric, biofuels or new generation clean diesel engines that have near zero particulate emissions.

   a. During 2017, the EMD will ask the Mayor and Fleet Management Steering Committee (FMSC) to consider an executive order that mandates replacement of eligible units with one of the green fleet alternatives mentioned above. Exceptions would require a written explanation and authorization from the appointing authority that operates the equipment and from the FMSC.

   b. During 2017 through 2020, the EMD and City Purchasing will solicit bids to replace off-road equipment with one of the green fleet alternatives mentioned above.

   c. During 2017 through 2020, the EMD will notify departments which units can be replaced with one of the green fleet alternatives mentioned above, and will help them acquire replacement funding.

2. During 2017 through 2020, the EMD will consider increasing its biodiesel blend from B2 to B5. B5 (5% biodiesel, 95% petroleum diesel) can be used in any diesel engine.

3. During 2017 through 2020, the EMD will explore the use of B20. The EMD must determine if the City's diesel engines are certified for use with B20 (20% biodiesel, 80% petroleum diesel). Significant reductions of PM, CO, and hydro-carbon emissions can be achieved with B20 blends.

4. During 2017 through 2020, the EMD and FMSC will collaborate with City departments to right-size equipment for their intended purpose. Reducing equipment sizes and weights where possible will lead to reduced fuel usage.

5. Use verified diesel emission control technology (VDEC) including verified diesel particulate filters (DPFs) or diesel oxidation catalysts (DOCs). Particulate filters are capable of capturing up to 95 percent of particulate matter or soot. DOCs are similar to converters installed on light duty vehicles. DOCs are capable of eliminating particulate matter by 20-50 percent.

a. During 2017 through 2020, the EMD will determine which units should be outfitted with this technology.

b. During 2017 through 2020, the EMD and Purchasing will obtain quotes and/or solicit bids to purchase particulate filters and DOC's to outfit units with this technology.

c. During 2017 through 2020, the EMD will help departments utilize existing funds and acquire new funds to purchase particulate filters and DOC's and outfit units with this technology.

6. Reduce fuel and resources used by leaving equipment on-site during extended projects.

7. Reduce unnecessary idling through the use of auxiliary power units, electric equipment, and strict enforcement of idling limits.

8. Replace older engines with newer, cleaner models.

9. Practice good engine maintenance to meet original standards, and properly train operators to run equipment efficiently.

10. Consider the use of multipurpose equipment as part of the replacement planning process to reduce the amount of equipment and the associated emissions including fuel consumption. The City uses multipurpose equipment in several departments. One example being the Water and Sewer Department which utilizes 72HP tractors with PTO's that drive batwings (both hydraulic and clutch).

4. Enforce Environmentally Preferable Purchasing Policy

The EMD's Energy Conservation & Efficiency Plan outlines the following five objectives for purchase specifications: 1) vendors submitting proposals for equipment acquisitions should demonstrate their company's efforts to reduce fossil fuels; 2) vendors should identify reductions in exhaust gases as part of new bid specifications; 3) vehicle specifications should meet and not exceed job task requirements in order to prevent purchasing oversized and over-powered equipment; 4) vehicle specifications should include multi-purpose equipment that reduces the amount of equipment and associated emissions; and, 5) for at least 25% of new vehicles and equipment bid specifications, vendors should bid a product that will operate efficiently on alternative fuel.

During 2017, the EMD will work with Purchasing to enforce an "environmentally preferable purchasing" policy and review all vehicle specifications to ensure green options are included where feasible.

5. Encourage Employees to Reduce Petroleum Use and Carbon Emissions

The City employs nearly 3,900 people. If 3,900 employees travel 20 miles per day between home and work (round trip), they would travel a combined 20.3 million miles per year. If their vehicles average 17 miles per gallon, they would consume nearly 1.2 million gallons of fuel. This results in over 10,000 tons of harmful carbon emissions being released into the Tulsa air-shed.

Table 6 identifies fuel and emissions reduction goals for employee vehicles (2017 through 2020).

Table 6 – Employee Vehicles: Fuel and Emissions Reduction Goals (2017 through 2020)

#	TARGET	2017 Goal	2018 Goal	2019 Goal	2020 Goal	4-Year Goal
1	Reduce petroleum consumption by 15%, or 180,000 gallons by the end of 2020	Reduce 24,000 gallons	Reduce 36,000 gallons	Reduce 48,000 gallons	Reduce 72,000 gallons	Reduce 180,000 gallons
2	Increase bus ridership by 20% by the end of 2020	Increase by 5%	Increase by 5%	Increase by 5%	Increase by 5%	Increase by 20%
3	Increase ride sharing participation by 20% by the end of 2020	Increase by 5%	Increase by 5%	Increase by 5%	Increase by 5%	Increase by 20%
4	Reduce annual carbon emissions from 10,000 tons to 8,000 tons by end of 2020. This is the equivalent of removing 383 passenger vehicles from the road	Reduce by 500 tons	Reduce by 500 tons	Reduce by 500 tons	Reduce by 500 tons	Reduce by 2,000 tons

Steps to Accomplish Reduction Goals (Employee Vehicles):

1. Partner with the City's Communication Department and Tulsa Area Clean Cities to promote petroleum reduction strategies through its website, special communiques, and through video and other electronic mediums (e.g. bus ridership, ride sharing).

    a. Promote the bus ridership program. The City of Tulsa partners with the Tulsa Transit Authority and employees are offered discounted bus passes to commute to and from work. In lieu of driving a personal vehicle, employees can purchase a monthly bus pass for unlimited rides to and from work. The employee cost is only $3 per month while the City pays the remaining cost of $42. This is the most inexpensive "ride share" program for City employees. The $3-per month employee cost calculates to a transportation cost of only $0.15 per day. An employee that weekly spends $30 for gas could instead ride the bus and reduce their monthly fuel cost by $117 or $97%. Riding the bus also benefits the environment, because employees travel to work via a CNG bus instead of a petroleum-fueled vehicle. Tulsa Transit buses are powered by CNG which burns 7 times cleaner than traditional fuels.

    b. Promote green driving techniques (e.g. properly inflate tires, reduce speeds, reduce idling, reduce unnecessary weight, and reduce number of tips made in car).

2. Offer electric vehicle lease incentives for employees. If the City purchases a particular brand of electric vehicle, the company will allow City employees to lease electric vehicles with no money down at a reduced rate.

3. Allow employees to purchase Compressed Natural Gas (CNG) at the City-owned fueling station at a reduced rate (rate would include applicable taxes).

4. Explore the possibility of selling biodiesel to employees at a reduced rate (rate would include applicable taxes).

5. Install Electric Vehicle (EV) charging stations at City facilities and allow employees to use EV charging stations for free.

6. Encourage Citizens to Reduce Petroleum Use and Carbon Emissions

The EMD will partner with the Tulsa Area Clean Cities Coalition (TACC) to promote the use of alternative fuel vehicles, to increase energy security, reduce fleet operating costs, and improve the environment while reducing petroleum use in the transportation sector. Together, these can create economic opportunity and improve public health.

During 2017 through 2020, the EMD will engage in the following strategies to encourage citizens to reduce petroleum use and carbon emissions:

1. Partner with the City's Communication Department and the Tulsa Area Clean Cities Coalition to educate fleets and individuals on alternative fuels, vehicle availability and refueling options.

2. Promote carbon reduction strategies and energy conservation tips through the EMD website, special communiques, signage at CNG stations, and through video and other electronic mediums.

3. Offer clean-burning Compressed Natural Gas (CNG) fuel to the public (CNG burns seven times cleaner than traditional fuels). By May 2017, two City-owned public CNG fueling stations will be operational (one will be open 24/7). CNG fuel is typically sold at a price 15% to 50% lower than traditional fuels.

4. Install Electric Vehicle (EV) charging stations in Tulsa for public use. The EMD was awarded a $50K grant to install EV stations in Tulsa. This initiative is meant to encourage Tulsa citizens to purchase electric vehicles that produce zero emissions.

5. Collaborate with the Oklahoma Public Fleet Management Association (OPFMA) to promote fleet best practices and clean fleet initiatives among Oklahoma's government fleet professionals.

Section 4: Next Steps

Achievement of these goals and targets will require the cooperation and participation of all City department and divisions. The Equipment Management Division, with support from the Fleet Management Steering Committee (FMSC), will take the lead in implementing these initiatives and will track the progress of the targets. Updates will be provided at mid-year and year-end to outline the activity that has taken place. We expect this document to be fluid- new technology, new grant opportunities, funding challenges, etc. are constantly happening. Every effort will be made to take advantage of the best options available to green our fleet, while minimally impacting City operations.