



# Energy & Water Conservation Plan and Fuel Management Plan

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October 2018

Support Services Division and Fleet Operation Division

## Overview

Pursuant to 34 Texas Administration Code, the Texas Department of Transportation (TxDOT) submits an updated Energy and Water Management Plan for AY 2019

TxDOT realizes that it is one of the largest energy using agencies within the state of Texas and is using this plan to demonstrate that it is also taking a leadership role to assist in energy management.

The Energy and Water Management plan is intended to help identify, plan, implement, and measure the effectiveness of the utility cost reduction measures. The plan will be used as a strategy document for TxDOT, to guide energy and water management policy.

Energy and water consumption and conservation are carefully considered in the development of each facility renovation and construction project to insure that the highest energy efficient equipment and the latest and best conservation measures are incorporated. All projects are designed to comply with the State Energy Code ASHRAE 90.1 – latest edition.

The areas of focus in energy conservation design are:

- Building Envelope – Includes roof and wall insulation and window assembly efficiency
- Heating & Cooling – Includes use of high efficiency equipment and proper sizing of the equipment and the use of Distributed Digital Control (DDC) systems that setback temperatures during non-occupied periods.
- Lighting – Includes design to proper light levels and use of efficient light sources, such as T-8 fluorescent and LED, both in the buildings and on hardscape surfaces throughout the state
- Water usage savings both as potable and non-potable
- Vehicle fuel consumption

The TxDOT Fleet Fuel Management Plan has been prepared in accordance with the State Agency Energy Savings Program Provisions identified in Senate Bill 59.

To minimize fuel use in all vehicles and equipment, TxDOT commits to:

- an agency-determined percentage savings goal for fuel expenditures
- employ a preventive maintenance program

- utilize the State's Fleet Data Management System
- document agency best practices

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## **Progress Report**

With TxDOT occupying over 1,650 buildings located at over 360 sites throughout Texas, there are approximately 20,000 utility bills, paid monthly, to support buildings, highway lighting, sign lighting, pump stations, and traffic signal lights. Due to this magnitude, it is apparent that the largest energy usage is electrical and should be the focus of energy savings measures. TxDOT operates in both the regulated and unregulated utility locations within the state. Approximately 40% of all electrical energy is in this unregulated environment. Currently, TxDOT is in the second year of a three year negotiated contract with an unregulated provider to provide “green” energy at a set cost for a three year period.

During Fiscal Year 2018, TxDOT had a 1.3% reduction in electrical usage. However, natural gas usage increased over 30% due to colder than normal winter temperatures. Below are some energy savings implemented by our agency during the past year:

- Completed capital construction projects in Kingsville, Pecos, Glen Rose and South Tarrant County that included exclusive LED lighting and newer energy efficient HVAC systems.
- Several smaller statewide projects replaced high bay shop and warehouse lighting with LED fixtures.
- Continued testing network capable thermostats in our facilities at the Austin Headquarter campuses. These are capable of remote access to be able to setback the temperature during unoccupied periods; limit the range that someone can adjust them; and remotely monitor the systems for proper operation. Installation of 2 of the thermostats was completed at our Camp Hubbard campus. The thermostats have performed well. As a result, this will be the new standard in which we use for future new thermostats.
- In the process of installing LED fixtures and automation control system (Lutron Vive) in our Austin Greer Building. Completed the installation of LED lighting throughout the Greer Building.

- Began a Preventive Maintenance (PM) contract to PM the HVAC units at Austin Headquarter campuses to ensure operating optimum efficiency.
- Replaced 67 outdated and inefficient HVAC systems at the Riverside Campus.

In the area of Fleet Operations, our agency operates over 12,000 vehicles and equipment engaged in road maintenance, construction oversight, plus road and bridge inspections. TxDOT achieved an overall reduction in fuel consumption of 7.5%; however, this reduction will be difficult to maintain due to Hurricane Harvey.

### **Energy Goals for Electric, Natural Gas and Water**

Building Operations and Maintenance accounts for 48.1% of the agency's energy (electric, gas and water) and fleet fuel operations account for 51.9% of the agency's overall energy. The agency has put in place a program to track all of this energy and specifically evaluate the top 10 consumers of each of these energy types and evaluate how the agency can make the most significant energy reductions with little to no capital investment based on trends.

The state energy code is becoming more stringent on controllability of energy usage in buildings and TxDOT intends to more aggressive in achieving compliance with state energy codes.

Based on the planned energy conservation activities and projects, TxDOT projects the following percentage savings goals in building energy usage:

- 1% in electric usage annually
- 1% in natural gas usage annually
- 1% in water usage annually (potable and non-potable): domestic and vehicle wash down

# Automotive Fuel Management Energy Plan

(Marine fuel is not included)

## Savings Goal for Fleet Fuel Expenditures

Fleet Operations has a goal of 1% reduction in total fuel energy (gasoline, diesel, CNG and propane) used in vehicles annually. In addition, the department is working to increase the use of alternative fuels while lowering emissions to help the state comply with EPA requirements.

TxDOT continues to evaluate alternative fuel strategies (primarily CNG, propane and hybrid/electric) to reduce gasoline use. Propane trucks are now located in districts where access to fuel sources can maximize use. TxDOT continues to evaluate other locations that might be feasible for expanding propane use and integrating propane dispensing more tightly into the Fleet Navigator (FNAV) fleet management system.

TxDOT is concluding a pilot of a CNG 10-yard dump truck that was put into field testing in FY17. The project team is evaluating operator feedback, truck performance, fuel availability, costs, and potential grant funding to determine whether it would be feasible to integrate additional CNG dump trucks into the agency's fleet.

TxDOT is currently piloting two all-electric and four plug-in gas/electric hybrid vehicles in Houston and Austin and has installed recharging stations in both locations. TxDOT is collecting feedback from employee drivers and will evaluate vehicle performance, maintenance and fuel data to assess the potential benefits of adding these types of vehicles to TxDOT's fleet where appropriate.

Additionally, TxDOT continues planning for the long-range use of alternative fuels within the agency. Recent efforts include applying for state and federal grants to defray the costs of alternative fuel vehicles, which are typically higher than traditionally fueled vehicles. TxDOT recently was awarded two grants. A \$36,000 Texas Commission on Environmental Quality (TCEQ) grant will be used to purchase a plug-in hybrid Ford F250 pickup truck that will operate in the Houston District. TxDOT will also receive \$427,000 through an Environmental Protection Agency state allocation grant. TCEQ assigned the Texas allocation to TxDOT. These funds will be used to replace aging dump trucks and an aerial device with cleaner units.

TxDOT's alternative fuels program considers the following issues when planning for the expansion of alternative fuels in its fleet:

- To be financially feasible, the cost of CNG fuel must be lower than gasoline. Although gasoline prices have risen somewhat in recent months, historic prices have not

supported significant cost savings to be gained with CNG conversions. Gasoline prices have been volatile and should be monitored for long-term impact.

- Public-access (retail) CNG stations remain limited, although the infrastructure is expanding in metropolitan areas.
- Targeting CNG vehicles in the state's metropolitan areas (particularly Dallas, Fort Worth, and Houston) can help with compliance with air quality standards.
- Several grant opportunities are available for supplementing funding for alternative fuel vehicles in TxDOT's fleet. SB 1731, which was passed by the 85<sup>th</sup> Texas Legislature, creates a governmental alternative fuels grant program under the Texas Emissions Reduction Plan, although no funding is specifically dedicated to this program. Federal and other grant programs are also available. TxDOT is researching these programs and will apply for those that are a good match for the agency.

### **TxDOT Preventive Maintenance Program**

TxDOT is responsible for properly obtaining, managing, using, and maintaining equipment to ensure appropriate use of tax dollars. TxDOT's equipment preventive maintenance (PM) program was established to comply with these responsibilities. All districts and divisions that have or use equipment must follow the PM program.

The current objectives of the PM program are the efficient and effective use of equipment, labor, tools, and facilities to achieve maximum serviceability and safety of the equipment fleet at the lowest overall cost to the agency.

TxDOT is conserving energy by maintaining vehicles in top operating condition to reduce fuel consumption.

### **TxDOT Preventive Maintenance Tracking and Forecasting Program**

The ability to track and manage PM allows TxDOT to leverage its resources wisely. As TxDOT seeks to extend vehicle and equipment life, it is critical to conduct PM activities in a timely manner.

TxDOT continues to realize the benefits of its comprehensive fleet management system Fleet Navigator (FNAV), which replaced *FleetTracks* and other legacy fleet management programs at the beginning of fiscal year 2015. FNAV manages data to improve savings and productivity by capturing scheduled/unscheduled repairs, tracking utilization, recording maintenance history and spending, and providing automated, paperless workflow. The software also includes a bulk fuel management system that accurately tracks when and where fuel is being used to improve accountability, reduce fuel consumption, and streamline record-keeping.

FNAV provides technology to forecast, plan, and record PM activities to maximize the service level and useful life of TxDOT's fleet. FNAV is improving safety and equipment availability with real-time data collection and location tracking through GPS. The system provides early alerts when unplanned service is needed and it tracks and schedules PM activities. TxDOT has avoided some costly repairs because of the maintenance and repair alerts provided by the system. Furthermore, the system has recorded a reduction in overall vehicle idle time since the system's rollout along with increased efforts to reduce unnecessary idling.

## **State Fleet Data Management System**

State agencies are required to report vehicle data on a monthly basis using the State's Fleet Data Management System, known as Texas Fleet System. TxDOT continues to use Texas Fleet System to produce and review vehicle reports, data summaries, and a minimum criteria calculation for its on-road vehicle fleet and to monitor its fleet cap.

## **TxDOT Fleet Policies and Best Practices**

The Texas Comptroller of Public Accounts (CPA) State Vehicle Fleet Management Plan established procedures to improve efficiency of the state fleet and reduce the cost of maintaining state vehicles.

TxDOT addressed the plan's requirements and recommendations by outlining and describing policies and procedures already in place and developing guidelines within the plan by creating the TxDOT Vehicle Fleet Management Plan which describes the policies, procedures, guidelines and best practices incorporated by the agency for managing its fleet. This document reflects the policies and procedures employed by TxDOT and the guidelines developed to meet the State Vehicle Fleet Management Plan's specifications. TxDOT continues to work with CPA to update and refine the State Vehicle Fleet Management Plan and is also working closely with CPA in its Enterprise Resource Planning initiatives.

## **TxDOT Fleet Operations Manual**

The TxDOT Fleet Operations Manual (formerly known as the Equipment Manual) provides policies and rules that TxDOT employees are required to follow in the management, use, repair, and disposal of motorized and non-motorized major equipment. The manual provides TxDOT managers and equipment users or maintainers with the basic policies and procedures to manage the TxDOT equipment fleet. The manual also provides updated information on laws, rules, policies and procedures that govern the use, control and management of the TxDOT equipment fleet.

TxDOT makes annual updates to the Fleet Operations Manual and will continue to incorporate appropriate issues relating to energy conservation.

## **Identified Strategies and Implementation Schedule**

TxDOT facilities statewide are installing LED lighting at a 100% rate for all new construction and major renovations. The agency is also installing LED lighting as replacements to existing lighting when possible.

In the area of signals, since the early 2000s, TxDOT has aggressively pursued the replacement of signal lighting with LED; and, today are almost at a 100% rate for all signals. In addition, conversion to LED lighting for highway illumination continues.

In AY 2019, capital construction projects in Dallas, Brownwood, Henrietta, Kaufman, Angleton and North Tyler will be completed to include exclusive LED lighting and newer energy efficient HVAC systems.

In AY 2019, multiple smaller projects are planned statewide to replace office, shop, parking and warehouse lighting with LED fixtures.

TxDOT will begin installing network capable thermostats in facilities at the Austin Headquarter campuses. This will allow for setback temperatures during unoccupied periods, limit the range of adjustment and provide remote monitoring for proper operation.

All New Construction and Major Renovation projects comply with the latest edition of the ASHRAE standards.

TxDOT continues to evaluate alternative fuel strategies (CNG, propane, E85, hybrid/electric) to reduce gasoline use.

Propane trucks are now located in districts where access to fuel sources can maximize use. TxDOT is currently evaluating other locations that might be feasible for expanding propane use and integrating propane dispensing into more tightly into FNAV.

A CNG dump truck has also been acquired and will be rotated between districts to determine performance and needs

## **Finance Strategy**

Our sole strategy is to fund any and all projects from current TxDOT appropriations.



## Employee Awareness Plan

TxDOT has a recycling team that puts out a monthly newsletter call Buy-Ways. This program encourages items such as:

- Being active in the Clean Air Plan (CAP)
- Turning lights out
- Recycling paper and cardboard
- Recycling aluminum cans
- Composting
- Using public transit or car pooling
- Using Energy Star products

TxDOT's Clean Air Plan (CAP) encourages and incentivizes employees to use alternate commuting options (carpool, bus, bike, walk, or telecommute) to prevent vehicle emissions. This does have the co-benefit of reducing overall energy usage.

The team has also placed stickers on light switches to remind employees to “turn the lights out” when not in use.

## Energy Team

TxDOT's Energy Team consists of:

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For more information about the **Clean Air Plan (CAP) Program**, contact your local CAP Coordinator