THE JORDAN INSTITUTE
BUILDING CLIMATE CHANGE SOLUTIONS

PRESS RELEASE

The Town of Henniker Building Energy Study

Prepared by The Jordan Institute , November 2011

Town of Henniker Receives Building Energy Study

Henniker Town Hall entrance

The Town of Henniker (Henniker) received a grant through the New Hampshire Energy Efficiency and Conservation Block Grant (EECBG) program to perform energy audits on eleven town buildings. The town issued an RFP (request for proposals) and chose The Jordan Institute (Jordan) to perform the energy study.

The purpose of the energy study was to evaluate the performance of the eleven town buildings and determine opportunities for energy improvement.

Jordan evaluated how energy is consumed by each of the building's end uses, discovered sources of energy waste and inefficiency, and strategized about appropriate **Energy Efficiency Measures (EEMs)** to be considered for future implementation. The results of the analysis indicated numerous energy use and cost reduction opportunities.

The energy study serves as a guide to help determine where to best invest resources to reduce building energy costs. The study identifies the lowest performing buildings and ways to approach improvements in the most cost effective way.

The next step will be to implement an aggressive, cost-effective, energy saving project at all the buildings; this could be done immediately or in phases starting with the poorest performing buildings.

The Police Department

The Town Highway Department

The Buildings Studied:

- Community Center 2,244 SF
- Fire Station 10,344 SF
- Grange Hall 2,888 SF
- Highway Dept. 5,632 SF
- Historical Soc. 3,904 SF
- Library 7,711 SF
- Police Station 3,360 SF
- Town Hall 6,098 SF
- Transfer Station 1,800 SF
- Waste Water 4,362 SF
- Water Treatment 1,675 SF

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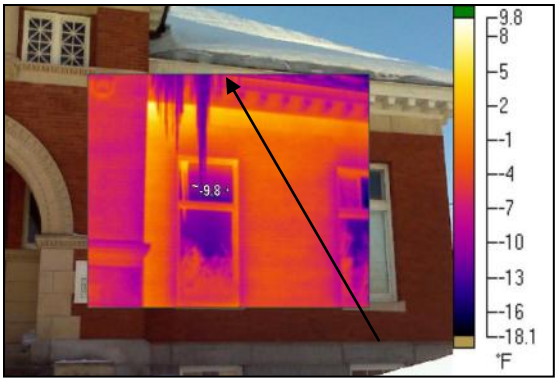
Ice damming along the eaves of the Library. Ice damming is caused by lack of proper air sealing and an inadequate level of insulation.



This infrared image of the Library shows the heat loss at the top of the wall that is creating the ice dams.

Blower door testing in progress at the Community Center

"The eleven buildings studied currently release a total of 475 metric tons of CO_2 into the atmosphere annually."

What Was Studied?

Each building studied has individual characteristics that determine and affect its performance. The sizes of the buildings are listed by square foot (SF) on the previous page.

The occupancy and schedule of use of each building was taken into account when recommendations were determined. The more a building is occupied, the more energy it uses, and the larger the opportunity for savings.

The energy usage and cost figures for the selected town buildings were also analyzed to show the current performance of each of the buildings. This process, known as "building benchmarking," rates a building's performance on two metrics: Energy Use Intensity (EUI) and Cost Use Intensity (CUI). Both are recognized as standard values in the industry.

EUI is the annual energy use in kBTUs (British Thermal Units, usually displayed as kBTUs to signify thousands of BTUs) per square foot of conditioned space in the building (kBTU/SF/YR). The town currently uses 296 kBTU/SF/YR of these eleven buildings. This high number leaves a great deal of room for improvement!

Many factors driving a building's CUI (dollar cost per square foot shown in $/SF/YR) are linked to current and future fuel prices and market conditions which are beyond the control of the town. However, it is also directly connected to the amount of energy used in each building, making conservation important. **The total yearly operating costs for these eleven buildings is $120,315. With the implementation of the recommended energy efficiency measures this could be reduced by 40%.**

Jordan also determined how leaky the buildings were. Blower door testing and infrared imaging was done on select buildings to determine areas of heat loss and air infiltration in the buildings. **All the buildings tested were more than double the standard for an air tight building.**

Green house gas emissions were calculated for each building to determine how many tons of carbon dioxide (CO_2) they emit. The eleven buildings studied currently release a total of 475 metric tons of CO_2 into the atmosphere annually.

What Was Found?

Infrared image of cold air moving from the attic space to the conditioned space at the Police Station.

Each building was evaluated individually and received its own energy improvement recommendations. Based on the analysis of all the buildings, three main areas of improvement were found overall.

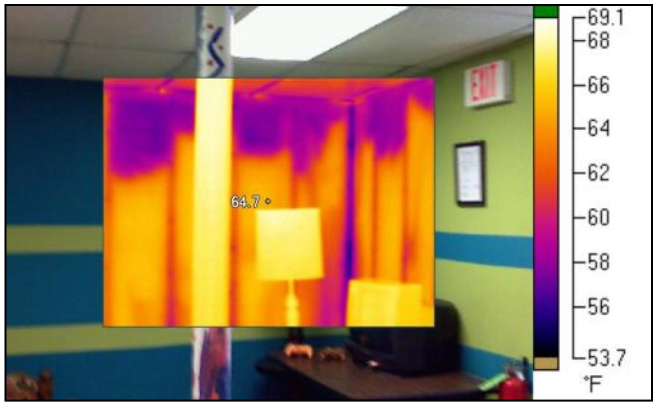
The first opportunity for the town is air sealing. A proper air seal is required in order for any insulation to perform. Due to the high levels of infiltration found with the blower door testing it was obvious that a large amount of the heat loss in the buildings was due to infiltration. Air sealing is also the least expensive measure to implement, resulting in quick paybacks. By air sealing attic planes, basements, windows and penetrations the resulting reduced infiltration will lead to large savings.

Air sealing will also increase the effectiveness of the second opportunity, insulation. Many of the old town buildings are not insulated. Through infrared imaging it was clear that many of the attic insulation assemblies were not performing well. By insulating exterior walls, increasing insulation levels in attics, and insulating basements the energy and costs required to heat the buildings will decrease dramatically.

The third opportunity for most of the buildings is a

fuel switch. The high cost of oil leaves the town vulnerable to the ever rising costs of oil. A major recommendation of the Jordan Institute is to switch as many buildings as feasible to biomass heating systems. The cost per million BTU of oil is currently at about $38, while the price per million BTU of wood pellets is at $16. **This will cut the towns heating costs by nearly 50%.** The green house gas emissions would also be greatly reduced by switching to wood pellets. It is important to first conserve energy as that can be guaranteed energy cost savings while fuel prices (even for biomass) cannot.

The batt insulation above the first floor of the Town Hall was poorly installed.



Infrared image taken in the basement of the Community Center. The fiberglass batt insulation is settling within the bays leaving areas without insulation.

Why Address Our Town Buildings?

The building sector consumes nearly half of all energy produced in the United States, and even more than half in the state of New Hampshire. Therefore, buildings are also the largest contributor to climate change in the U.S. and globally. In coming years, the building sector's energy consumption is expected to grow faster than that of industry and transportation.

Reducing energy demand through building efficiency is significantly cheaper, faster, and more effective than finding alternative ways to produce that energy. Energy conservation is the first and most important step in weaning ourselves off fossil fuels.

The energy study includes a financial model that shows which recommended energy measures are worthwhile investments. The energy study shows the cost of each measure, the energy and cost savings, the simple payback, the internal rate of return and the net present value for each measure. The model reveals that the majority of the recommendations are considered good investments with short payback periods.

The energy study financial modeling reveals that the town could save almost $62,000 a year, cutting the town building operating costs in half, and still see a return on investment in less than 10 years. The next step is to use this valuable information and tools included in the energy study to save money, create more comfortable buildings and lessen the town's impact on the environment.

An old wood framed single pane window in Grange Hall with rope pulley. Several buildings had poor performing windows.

Street View of Grange Hall

Street view of the Fire Station

"Save money, create more comfortable buildings and lessen the town's impact on the environment."

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ABOUT THE JORDAN INSTITUTE:

The Jordan Institute is a non-profit building consulting firm that works to implement significant climate change solutions by reducing energy use in buildings. Energy reduction is the fastest, most cost-effective strategy to reduce greenhouse gas emissions, as buildings represent 59% of all energy use in New Hampshire. Energy efficiency measures are available immediately, at reasonable cost, and yield tremendous gains in building performance. The urgency of our work is inspired by the knowledge we must reverse the growth of fossil fuel emissions worldwide within the next several years to avoid irreversible climate change. Please see our website to learn more about this critical issue.

Our work consists of three main programs:

- Green building and high performance consulting, and LEED certification
- Energy audit assessments, recommendations, comprehensive and objective project management and over-sight as well as commissioning for energy efficiency projects
- Energy policy efforts in the Legislature and Public Utilities Commission and membership on numerous state-wide climate change advisory boards and working groups

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