

INDIANOLA SUSTAINABILITY STUDY

INDIANOLA MUNICIPAL UTILITIES
CITY OF INDIANOLA, IA
INDIANOLA SUSTAINABILITY COMMITTEE

WITH THE SUPPORT OF:
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ACKNOWLEDGMENT AND DISCLAIMER

This report was prepared with the support of the Iowa Power Fund Board and the Iowa Office of Energy Independence. However, any opinions, findings, conclusions or recommendations expressed herein are those of the Indianola Municipal Utilities, the City of Indianola, its consultants and the Indianola Sustainability Committee and do not necessarily reflect the views of the Iowa Power Fund or the Office of Energy Independence.

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SECTION I: EXECUTIVE SUMMARY

The purpose of this report is to summarize the findings of the Indianola Sustainability Study (ISS). The function of the ISS is to identify, develop, fund, and implement new strategies that can best reduce energy consumption and overall carbon footprint within the city corporate boundaries over the next five years. The study includes an evaluation of electric and natural gas energy consumption, traffic and commuting study, and cost/benefit analysis of energy conservation measures.

Background

The City of Indianola (City) is located in Warren County, approximately 20 miles south of the City of Des Moines, Iowa. The estimated population is 14,156, based on a special census conducted in 2005, and the City has experienced population growth of more than 2% annually since 2000.

The electric utility is a municipally-owned utility operated by Indianola Municipal Utilities (IMU) under the direction of its Board of Trustees. IMU provides electric service, water, and telecommunications services to customers within and adjacent to the City. There are approximately 6,000 electric customers.

Natural gas service in the City is provided by MidAmerican Energy Company (MEC). MEC serves 4,600 residential, 440 commercial/industrial retail, and 2 industrial transportation customers. Total end user consumption on the MEC distribution system in 2009 was 660,695 million British thermal units (MMBtu).

Energy Use Profile

Customer energy usage data was collected from a number of sources, including utility billing records, survey data, energy audits, and other publicly available information. This data was collected for the period June 2009 through May 2010, which represented the most recent data available for the system.

Table I-1 (see page 4) shows the consolidated energy usage profile for the City at the source of fuel input. The City is responsible for the consumption of approximately 2.4 million MMBtu of energy. Of this total, 48% is related to electric usage, 30% is related to natural gas and 22% of related to transportation.

**Table I-1
Estimated City-Wide Energy Usage at Source**

Fuel / Sector	Energy Usage at Source	
	(MMBtu)	(%)
Electricity (1)		
Residential	488,888	20.7%
Commercial	400,796	16.9%
Industrial	135,094	5.7%
Government	102,408	4.3%
Total Electric	1,127,186	47.7%
Natural Gas (2)		
Residential	484,293	20.5%
Commercial	161,431	6.8%
Industrial	74,781	3.2%
Government	-	0.0%
Total Natural Gas	720,504	30.5%
Transportation		
Gasoline (3)	497,040	18.6%
Diesel (4)	20,729	0.8%
Total Transportation	517,769	21.9%
Total Energy at Source	2,365,459	100.0%

Notes:

- (1) Based on average heat rate of 10,500 Btu/kWh.
- (2) Based on MEC sales, plus 9.1% for natural gas losses.
- (3) Based on lower heating value of 116,000 Btu per gallon.
- (4) Based on lower heating value of 133,000 Btu per gallon.

CO2 Emission Inventory

Table I-2 (see page 5) shows the consolidated carbon dioxide (CO₂) emissions inventory for the City, taking into account electric fuel use, natural gas consumption, and transportation. The inventory does not take into account emissions from cement production, which is a significant non-energy related source of CO₂ emissions. Incidental activities, such as outside cooking and wood burning, are also not included. CO₂ emissions related to energy use in the City were estimated to be approximately 171,000 tons per year. Electric energy accounted for 53% of CO₂ emissions, natural gas accounted for 23% of CO₂ emissions, and transportation accounted for 24% of CO₂ emissions.

**Table I-2
Summary of CO2 Emissions Inventory**

Fuel / Sector	Emissions	
	(MT CO2)	(%)
Electricity		
Residential	38,923	22.8%
Commercial	31,910	18.7%
Industrial	10,756	6.3%
Government	8,153	4.8%
Total Electric	89,742	52.6%
Natural Gas		
Residential	26,486	15.5%
Commercial	8,829	5.2%
Industrial	4,090	2.4%
Government	-	0.0%
Total Natural Gas	39,405	23.1%
Transportation		
Gasoline	40,143	23.5%
Diesel	1,276	0.7%
Total Transportation	41,419	24.3%
Total Emissions	170,566	100.0%
Sequestration Rate (acres/MT CO2) (1)		
Low Rate	2.2	
High Rate	9.5	
Afforestation Required (acres)		
Low Rate	77,530	
High Rate	17,954	

Notes:

- (1) Based on "Representative Carbon Sequestration Rates and Saturation Periods for Key Agricultural & Forestry Practices," June 2010. Converted from MT C to MT CO2.
<http://www.epa.gov/sequestration/rates.html>

One method to visualize the City's CO2 emissions is to put it in terms of how many acres of trees would need to be planted to sequester the carbon emissions. An area of 28 to 121 square miles would be required to sequester the carbon emissions from the identified sources in Table I-2. The area of the City is approximately 9 square miles; it would require an area of 3 to 12 times the current size of the City to sequester IMU's current CO2 emissions.

End Use Profile

The energy survey, monthly energy usage profile, and energy audits were used to develop an understanding of electric energy usage in the IMU service territory. Other publicly available information was used to develop an understanding of the usage for various end uses for customers. Table I-3 summarizes the end use profile for the City’s residential customers.

**Table I-3
Estimated Residential Electric Usage Profile**

End Use	Energy Usage	
	kWh	%
Heating (1)	8,390,001	17.6%
Electronics (2)	7,264,565	15.2%
Cooling	5,536,797	11.6%
Refrigeration	5,244,472	11.0%
Other Uses	4,972,536	10.4%
Water Heating	4,506,361	9.5%
Lighting	4,234,425	8.9%
Clothes Dryers	3,146,683	6.6%
Other Appliances	2,330,876	4.9%
Freezers	2,020,093	4.2%
Total Energy	47,646,809	100.0%

1. Includes electric heat, miscellaneous space heating and furnace blower motors for non-electric heat.
2. Combined usage of televisions, miscellaneous electronics and computers.

Table I-4 approximates the end uses of natural gas for the retail customers served by MEC. The primary uses of natural gas for residential customers in the City are space heating, water heating and cooking. Space heating is responsible for approximately 66% of natural gas consumption, based on a comparison of summer natural gas usage to winter natural gas usage. Other uses, including water heating, cooking and process uses for commercial customers, comprise approximately 34% of natural gas consumption.

**Table I-4
Estimated Retail Natural Gas Usage Profile**

End Use	Energy Usage	
	MMBtu	%
Heating	389,036	65.7%
Other Uses	203,100	34.3%
Total Energy	592,136	100.0%

Table I-5 summarizes transportation fuel usage, in gallons of fuel burned, for all work travel, school, extracurricular activities and shopping / errands. Projected fuel consumption was 3.79 million gallons of gasoline and 140,000 gallons of diesel fuel. More than 80% of fuel consumption and miles driven were related to work, including commuting to work.

**Table I-5
Estimated Transportation Fuel Use and Mileage**

Sector	Miles	Fuel Usage (gal)	
		Gasoline	Diesel
Household			
Work	61,051,780	2,805,760	-
School	3,191,450	157,590	-
Extracurricular	8,684,720	405,720	-
Shopping	2,774,790	121,380	-
Subtotal - Household	75,702,740	3,490,450	-
Subtotal - Business (1)	-	-	-
Public Agency			
School		18,613	37,225
City		32,530	26,677
County		105,615	66,960
Subtotal - Public Agency		156,758	130,862
Simpson College			
Fleet		13,829	6,914
Faculty / Staff Commuter		69,105	-
Student Commuter		57,645	-
Total Simpson College		140,579	6,914
Total Fuel Usage		3,787,786	137,777

Notes:

(1) Business fleet usage deemed to be insignificant based on limited fleet.

Cost / Benefit Analysis

The purpose of the cost/benefit analysis is to identify energy efficiency and sustainability measures that are cost effective and can help the City reduce energy usage. This review was based on the energy use analysis, energy audit results and cost information for renewable resource options provided by third parties and IMU.

Nine potential policies were found to be cost effective and had the potential to reduce non-renewable energy use and emissions by 1% from existing levels. These policies are summarized in Table I-6 (see page 8). If all of the proposed measures were implemented, energy consumption at the source would be reduced 10% and CO₂-equivalent emissions would be reduced by 44,000 tons, or 26%.

**Table I-6
Summary of Cost-Effective Measures
Energy Savings and CO2 Reductions**

Measure		
	MMBtu	CO2
Existing System	2,365,459	170,566
Efficiency Measures		
Residential Lighting	25,449	2,234
Commercial Audit	25,384	1,972
Residential Insulation	32,744	1,953
Subtotal - Efficiency	83,577	6,159
Transportation		
Satellite Office	5,745	464
Ride Share	24,754	1,900
Hybrid Police Cars	520	40
Mass Transit	-	-
Subtotal - Commuting	31,019	2,404
Sustainable Resources		
Landfill Gas	77,963	32,188
Wind Energy	44,968	3,580
Subtotal Resources	122,931	35,768
Total Reductions	237,527	44,331
% Reduction	10.0%	26.0%

Cost / Benefit Analysis

Implementing all of the proposed measures may not be practical because of funding limitations, customer acceptance, reliability concerns, or other issues. The total capital cost of all the selected measures was more than \$11.1 million. Table I-7 (see page 9) summarizes the ranking of the various criteria for each of the proposed policies. While this ranking system is not intended to be a scoring system, it can be used to identify those options that have higher likelihood for success. The City should consider implementing the listed measures as funds become available and based on customer interest.

**Table I-7
Summary of Cost-Effective Measures
Energy Savings and CO2 Reductions**

Proposed Measure	Cost	Screening Assessment (1)				
		Customer Acceptance	Ease of Implementation	Cost / Benefit Analysis	Environmental Impacts	Operational Impacts
Efficiency Measures						
Res Lighting (2)	330,000	Fair	Fair	Excellent	Good	Excellent
Comm Audit (2)	2,700,000	Fair	Fair	Excellent	Good	Excellent
Res Insulation (2)	540,000	Good	Fair	Excellent	Excellent	Excellent
Transportation						
Satellite Office (3)	1,500,000	Good	Poor	Good	Good	Good
Ride Share (4)	540,000	Fair	Fair	Good	Good	Good
Hybrid Police (5)	10,500	Fair	Good	Good	Good	Good
Mass Transit	-	Fair	Fair	Fair	Good	Good
Sustainable Resources						
Landfill Gas (3)	3,000,000	Good	Excellent	Excellent	Excellent	Excellent
Wind Energy (3)	2,500,000	Excellent	Fair	Good	Excellent	Fair
Total	11,120,500					

Notes:

- (1) Ratings Assigned: Excellent, Good, Fair, Poor.
- (2) Total upfront cost of complete implementation without regard to funding source (customer, utility, third party grants, third party rebates).
- (3) Based on upfront capital cost of measure. Alternative arrangements (lease, purchased power agreement) may spread capital cost over term of agreement.
- (4) Total cost over five years.
- (5) Total cost over five years, incremental vehicle cost only, based on replacement with hybrids when police vehicles would have been replaced.

Lessons Learned

An important part of this study process was to note issues identified during data collection, analysis, and report preparation. This is important for other cities and utilities that may want to pursue a similar project for evaluating energy conservation and sustainable energy projects. While none of the issues prevented the project from being completed, other cities may be able to avoid some of the issues that were encountered.

1. One question was worded in a way that some respondents provided incorrect answers. IMU clarified answers that appeared to be incorrect. Future surveys may want to consider clearer wording.
2. If commercial property owners agree to an audit, there needs to be clear communication with the tenants to ensure access is granted and cooperation is provided.
3. Customers may not be interested in energy efficiency issues, or may be unwilling to implement findings that have short payback periods.
4. Commercial and industrial customers that are part of large regional or national chains often have centralized energy management and procurement strategies that make implementing local energy efficiency measures difficult.

Suggested Action Items for City

Based on the analyses completed and discussions with the City, IMU and the Indianola Sustainability Committee, the following action items are suggested. These suggestions are subject to governing body approval by the IMU Board of Trustees and / or the City Council, adequate funding and customer acceptance.

Efficiency

1. Continue encouraging conversion of residential lighting fixtures from incandescent to compact fluorescent lighting or other high-efficiency lighting measures.
2. Work with commercial and industrial customers to implement energy efficiency measures with short payback periods.
3. Help residential customers improve attic insulation to reduce heating and air conditioning bills.
4. Require customers to complete and document air conditioner sizing calculations and comply with other energy codes as part of the code enforcement process for new construction.

5. Require customers that request rebates for new air conditioning and heating equipment to submit load-sizing calculations.

Transportation

1. Consider encouraging telecommuting or the use of a local satellite office for commuters that travel to Des Moines for work.
2. Explore ride share programs with regional transit authorities and local residents that commute to Des Moines.
3. Consider purchasing hybrid vehicles when existing police vehicles are scheduled for replacement.

Sustainable Resources

1. Based on the cost/benefit analysis, consider utility-scale renewable energy resource purchases as needed to satisfy customer interest and regulatory requirements (if applicable).
2. Landfill methane energy has favorable operating characteristics (baseload energy) and negative CO₂-equivalent emissions.
3. Additional large-scale wind energy purchases can typically be added through IMU's existing arrangements with the City's wholesale power supplier, the Municipal Energy Agency of Nebraska (MEAN) at a lower cost than small-scale, local renewable resources.

SECTION II: INTRODUCTION

The purpose of this report is to summarize the findings of the Indianola Sustainability Study (ISS). The function of the ISS is to identify, develop, fund, and implement new strategies that can best reduce energy consumption and overall carbon footprint within the city corporate boundaries over the next five years. The study includes an evaluation of electric and natural gas energy consumption, traffic and commuting study, and cost/benefit analysis of energy conservation measures.

The ISS consisted of three phases:

- Phase I: Collection of End Use Data, Data Analysis, and Report Preparation.
- Phase II: Cost/Benefit Analysis of potential energy conservation and sustainability practices.
- Phase III: Prepare a report with proposed policy guidelines, taking into account the analysis completed for Phases I and II, including public input.

Background

City of Indianola

The City of Indianola (City) is located in Warren County, approximately 20 miles south of the City of Des Moines, Iowa. The estimated population is 14,156, based on a special census conducted in 2005, and the City has experienced population growth of more than 2% annually since 2000. In 2009, Warren County had the fourth highest population growth rate of counties in Iowa.

The primary economic influences on the community are Simpson College, a liberal arts college with 1,500 full-time students, and the Des Moines metropolitan area. A large number of residents commute to Des Moines, which leads some to refer to the City as a “bedroom community” of Des Moines. The City has a well-regarded public school system consisting of four elementary schools, a middle school, and high school.

Demographically, the City ranks above the state average in household income and educational level. For example, 27% of residents age 25 and over have at least a bachelor’s degree and more than 90% have at least a high school diploma. The presence of Simpson College contributes to a relatively high proportion of residents with advanced degrees.

A significant number of residents commute to neighboring cities for employment. In the 2000 census, the average commute time to work was approximately 22 minutes. More than 75% of

residents commuted to work alone by car, truck or van. Approximately 13% participated in car pools and less than 1% used public transportation.

Electric Utility

The electric utility is a municipally-owned utility operated by Indianola Municipal Utilities (IMU) under the direction of its Board of Trustees. IMU provides electric service, water, and telecommunications services to customers within and adjacent to the City. There are approximately 6,000 electric customers, including 5,350 residential, nearly 560 commercial, 9 industrial customers, 20 governmental and City-owned accounts, and approximately 40 street and private lighting customers.

Natural Gas Utility

Natural gas service in the City is provided by MidAmerican Energy Company (MEC). MEC serves 4,600 residential, 440 commercial/industrial retail, and 2 industrial transportation customers. Total end user consumption on the MEC distribution system in 2009 was 660,695 million British thermal units (MMBtu).

Transportation

The local transportation system is centered on passenger vehicle traffic. The City is located at the intersection of U.S. Highway 65/69 (north/south) and State Highway 92 (east/west). U.S. Highway 65/69 is a four-lane divided highway north of the City to the Des Moines metropolitan area and State Highway 92 is a two-lane highway. The nearest Interstate system is Interstate 35, located approximately 10 miles west of the City.

The majority of vehicle miles on the highways located within the City limits are related to passenger vehicle trips, local truck deliveries, and shipping for commercial and industrial customers. There is limited long-distance truck traffic because of the close proximity of Interstate 35 (north/south) and Interstate 80 (east/west).

SECTION III: ENERGY USE PROFILE

The purpose of Phase I was to develop an energy use profile for the City. This task was split into two sub-phases: Collection of End Use Data and Data Analysis/Report Preparation. The goal was to develop an energy use profile that included fuel use, City-wide energy use, and emissions by category of end use.

The approach to completing Phase I involved completing several steps:

- Energy consumption data was collected for the retail electric and natural gas customers served within the corporate limits of the City.
- Transportation data was compiled as part of the City's Comprehensive Planning activities.
- A survey of residents was prepared to collect additional information about energy consumption and transportation patterns.
- A series of residential and commercial energy audits were prepared to identify energy savings and to calculate the costs and benefits of implementing various energy conservation measures.

This section of the report was prepared to summarize the findings of the Phase I analysis

Collection of Customer Usage Data

Customer energy usage data was collected from a number of sources, including utility billing records, survey data, energy audits, and other publicly available information. This data was collected for the period June 2009 through May 2010, which represented the most recent data available for the system. Some data, including emissions factors and ultimate fuel source for electrical energy, was based on calendar year 2009 information, which was the most recently available information.

Electric

Table III-1 (see page 15) summarizes retail electrical energy sales for the period May 2009 through April 2010. Retail sales were approximately 110,000 MWh, with residential sales comprising the largest portion of retail sales with approximately 43% of retail sales. Commercial customers were 36% of energy sales, industrial sales were approximately 12% and governmental sales approximately 9% of retail sales.

**Table III-1
Summary of Electrical Energy Usage**

Fuel / Sector	Energy Consumption		
	MWh	MMBtu (1)	(%)
Electricity			
Residential	47,718	162,861	43.4%
Commercial	39,120	133,516	35.6%
Industrial	13,186	45,003	12.0%
Government	9,996	34,115	9.1%
Total Electric	110,019	375,495	100.0%

Notes:

- (1) Based on conversion of 3,413 Btu/kWh.
- (2) Based on heat rate of 10,500 Btu/kWh.
- (3) Based on emissions factor provided by MEAN for calendar year 2009.

To compare electrical energy consumption to natural gas, gasoline and diesel consumption, it is necessary to convert electrical energy to a common unit of energy measurement. Converting electrical energy to thermal energy expressed as British thermal units (Btu) resulted in energy consumption of 375,000 MMBtu.

The highest energy sales occur in the summer season (June through September), primarily because air conditioning energy usage is much higher in these months. Sales in December are comparable to sales in the summer season, primarily resulting from sales to customers that use electricity for heating purposes.

Natural Gas

Total end use consumption of natural gas on the MEC distribution system in 2009 was 660,695 MMBtu. Natural gas sales are measured in dekatherms (Dth), which is thermally equivalent to 1 MMBtu. Retail sales in 2009 were 592,136 Dth and transportation service delivered approximately 68,559 Dth. Residential sales were approximately 444,000 Dth and commercial/industrial retail sales were 148,000 Dth.

Sales in the winter season (November through March) are higher than in other months because of increased usage for space heating purposes. Monthly sales in the winter season averaged approximately 94,700 MMBtu per month, compared to 16,925 MMBtu per month in the non-winter months. In non-winter months, residential and commercial usage is typically limited to water heating and cooking.

Transportation

Snyder and Associates (Snyder) was separately retained to complete the transportation energy use portion of this study, summarizing fuel usage and driving patterns within the City. Snyder previously completed the City's comprehensive plan, which included traffic flow studies, transportation needs, and street and highway planning. The Snyder report is included as Appendix A to this report.

Transportation energy use was separated into four categories: Household, business, public agency, and Simpson College. Table III-2 summarizes transportation fuel usage, in gallons of fuel burned, for all four sectors. Projected fuel consumption was 3.79 million gallons of gasoline and 138,000 gallons of diesel fuel.

**Table III-2
Estimated Transportation Fuel Use and Mileage**

Sector	Miles	Fuel Usage (gal)	
		Gasoline	Diesel
Household			
Work	61,051,780	2,805,760	-
School	3,191,450	157,590	-
Extracurricular	8,684,720	405,720	-
Shopping	2,774,790	121,380	-
Subtotal - Household	75,702,740	3,490,450	-
Business (1)			
Fleet	-	-	-
Subtotal - Business	-	-	-
Public Agency			
School		18,613	37,225
City		32,530	26,677
County		105,615	66,960
Subtotal - Public Agency		156,758	130,862
Simpson College			
Fleet		13,829	6,914
Faculty / Staff Commuter		69,105	-
Student Commuter		57,645	-
Total Simpson College		140,579	6,914
Total Fuel Usage		3,787,786	137,777

Notes:

(1) Business fleet usage deemed to be insignificant based on limited fleet usage.

Fuel Use and Emissions Profile

End use energy consumption is one step in determining the fuel use and emissions profile for the City. Electrical energy generation is provided by use of various fuels, including coal, natural gas, nuclear fission, hydroelectric production and wind, each of which operates at a different efficiency. Transportation is typically provided by gasoline, diesel or ethanol. A significant amount of energy is consumed in the production of transportation fuels, including electrical and other thermal energy for drilling, pumping, refining, transportation, and distribution.

Electric

Table III-3 (see page 18) shows the breakdown of energy production by fuel source for the City. This information was provided by the City's wholesale electric supplier, the Municipal Energy Agency of Nebraska (MEAN). Approximately 7% of the City's electric supply is from renewable energy sources, including hydroelectric energy and wind energy. Approximately 93% of the City's electric supply is from non-renewable resources. Coal is the primary fuel for 69% of electric energy generation used to supply the City, nuclear energy is the primary fuel for 17% and natural gas supplies 7% of the City's electrical energy.

Table III-4 (see page 19) summarizes the estimated fuel input for the City's electrical energy resources. The fuel input to produce energy is higher than the energy produced because of energy losses in transmission and distribution, energy conversion losses, and the efficiency of electrical resources typically being less than 40% for coal and nuclear resources. Efficiency of advanced natural gas resources using heat-recovery steam generation can exceed 50%. The efficiency of generating resources is generally limited by the thermodynamic efficiency of boilers, steam turbines, cooling system and other components in electric generation facilities.

**Table III-3
Summary of Fuel Consumption – Electric Generation**

Fuel / Sector	Energy Consumption	
	MWh	(%)
Renewable Fuels		
Hydro	2,365	2.0%
Wind	5,672	4.7%
Subtotal - Renewable	8,037	6.7%
Non-Renewable Fuels		
Coal	83,660	69.5%
Nuclear	20,049	16.7%
Oil / Natural Gas	8,573	7.1%
Subtotal - Non-Renewable	112,282	93.3%
Total Resources	120,319	100.0%
Fuel / Sector	Energy Input	
	MMBtu	(%)
Renewable Fuels		
Hydro	-	0.0%
Wind	-	0.0%
Subtotal - Renewable	-	0.0%
Non-Renewable Fuels		
Coal (2)	826,895	73.4%
Nuclear (2)	210,274	18.7%
Oil / Natural Gas (3)	90,017	8.0%
Total Energy at Source	1,127,186	100.0%

Notes:

- (1) Based on EIA publication, "Approximate Heat Rates for Electricity, and Heat Content of Electricity, 1949-2008," <http://www.eia.doe.gov/aer/txt/ptb1306.html>.
- (2) Based on heat rate of 10,500 Btu/kWh.

Table III-4
Summary of Fuel Input and CO2 Emissions
Electric Utility

Fuel / Sector	MMBtu (1)	(%)
Energy at Source (MMBtu) (2)		
Residential	488,888	43.4%
Commercial	400,796	35.6%
Industrial	135,094	12.0%
Government	102,408	9.1%
Total Energy at Source	1,127,186	100.0%
CO2 Emissions (tons) (3)		
Residential	42,913	43.4%
Commercial	35,181	35.6%
Industrial	11,858	12.0%
Government	8,989	9.1%
Electric CO2 Emissions	98,941	100.0%

Notes:

- (1) Based on conversion of 3,413 Btu/kWh.
- (2) Based on heat rate of 10,500 Btu/kWh.
- (3) Based on emissions factor provided by MEAN for calendar year 2009.

When electric energy consumption is reduced, the fuel input savings are greater than the avoided energy use because of the relatively low efficiency of most electric generation technologies. A reduction of 1 kilowatt hour (kWh) in energy used at the retail level usually results in 10,000 – 11,000 Btu (approximately 3 kWh) of reduced fuel input. If energy conservation occurs during hours when energy usage is highest (peak hours), it may be possible to defer or eliminate the installation of additional peaking generating resources. Implementing energy conservation that reduces usage during all hours may result in reduced need for baseload resources like coal or nuclear facilities.

Energy input to produce electric energy used by the City was estimated to be approximately 1.13 million MMBtu. Coal represented approximately 73% of the thermal energy input for electric generation, with nuclear providing 19% and oil/natural gas providing 8% of estimated energy input.

Carbon dioxide (CO₂) emissions are an increasingly important consideration in utility planning and sustainability reviews. Carbon dioxide is viewed by many as a contributing factor in man-made climate change. There has been discussion at the Federal level of imposing a carbon tax or otherwise limiting carbon dioxide emissions. If a carbon tax or emissions limitations were imposed on electric utilities, there may be a financial incentive or legal requirement for the City to reduce its energy usage or the proportion of energy purchased from carbon-based resources. A portion of the scope for this study was to determine the CO₂ emissions attributed to each of the City's retail rate classes and to the various end uses.

Emission factors were provided by MEAN for each of its generation fuel sources. CO₂ emissions ranged from 0 lbs per MWh for wind, hydroelectric and nuclear energy to 2,249 lbs per MWh for energy from coal-fired generation. Coal has a much higher CO₂ emission factor since the primary source of energy is carbon as compared to natural gas, which has a lower carbon content or nuclear, wind or hydroelectric energy that does not rely on carbon-based energy.

Table III-5 (see page 13) estimated CO₂ emissions related to the City's sales of electric energy. Estimated emissions were approximately 99,000 metric tons, including 94,000 metric tons related to coal generation and 5,000 metric tons for energy produced by natural gas. Residential and commercial customers are responsible for the majority of CO₂ emission from electrical consumption, with emissions of 42,900 metric tons for residential customers and 35,200 metric tons from commercial customers. Industrial electrical consumption is responsible for 11,900 metric tons and governmental customers are responsible for approximately 9,000 metric tons of CO₂ emissions.

Natural Gas

Total natural gas sales of approximately 661,000 MMBtu were projected based on historical sales data. Residential sales comprised 67% of annual natural gas sales, while commercial and industrial sales comprised approximately 33% of sales.

To deliver 1 MMBtu of natural gas to an energy consumer, there are energy losses associated with natural gas processing, compression, and leaks. According to the Energy Information Administration, approximately 9.1% of natural gas produced is used between the wellhead and the end use customer (see Appendix Table B-1). Adding 9.1% to retail sales results in total natural gas consumption at the source of 721,000 MMBtu.

Burning 1 MMBtu of natural gas produces approximately 120.6 lbs of CO₂ emissions. Applying this emissions factor and converting to metric tons results in 39,400 metric tons of annual CO₂ emissions. This factor does not take into account methane emissions from leaking natural gas or unburned natural gas from furnaces and other combustion sources. Methane is a greenhouse gas with "greenhouse gas intensity" on a per molecule basis that is more than 80 times that of CO₂.

**Table III-5
Estimated CO2 Emissions – Electric Energy Resources**

Fuel / Sector	Estimated Emissions		
	MWh	CO2 Emission Factor (lbs/MWh)	CO2 Emissions (tons)
Renewable Fuels			
Hydro	2,365	-	-
Wind	5,672	-	-
Subtotal - Renewable	8,037		-
Non-Renewable Fuels			
Coal	83,660	2,249	94,076
Nuclear	20,049	-	-
Oil / Natural Gas	8,573	1,135	4,865
Subtotal - Non-Renewable	112,282		98,941
CO2 Emissions (tons) (1)			
Residential	47,718	899	42,913
Commercial	39,120	899	35,181
Industrial	13,186	899	11,858
Government	9,996	899	8,989
Electric CO2 Emissions	110,019		98,941

Notes:

(1) Allocation of CO2 emission based on energy sales for each rate class.

Transportation

Gasoline and diesel consumption was responsible for 458,000 MMBtu of energy usage. There is additional energy usage required to refine gasoline and diesel fuel from crude oil. According to Argonne National Laboratory, the refining efficiency for gasoline is approximately 89%. This indicates that the fuel input at the source for transportation consumption is approximately 518,000 MMBtu (see Appendix Table B-2).

Based on fuel input, the projected CO2 emissions at the source is approximately 41,400 metric tons. This projection has a larger degree of uncertainty than other estimates because the energy used for gasoline refining varies significantly between refineries. Refineries also use differing amounts of electric generation and the fuel mix for the various resources will vary significantly in different regions of the country. Energy use in transporting gasoline and diesel to the City was not included in the CO2 estimates for transportation. There would be CO2 emissions associated with pumping fuel through regional pipelines to local terminals and truck transportation costs

from the terminal to local gas stations. These emissions are likely insignificant compared to the fuel consumed in vehicle operations and refining.

City-Wide Energy Usage

Table III-6 shows the consolidated energy usage profile for the City at the source of fuel input. The City is responsible for the consumption of approximately 2.4 million MMBtu of energy. Of this total, 48% is related to electric usage, 30% is related to natural gas and 22% of related to transportation.

**Table III-6
Estimated City-Wide Energy Usage at Source**

Fuel / Sector	Energy Usage at Source	
	(MMBtu)	(%)
Electricity (1)		
Residential	488,888	20.7%
Commercial	400,796	16.9%
Industrial	135,094	5.7%
Government	102,408	4.3%
Total Electric	1,127,186	47.7%
Natural Gas (2)		
Residential	484,293	20.5%
Commercial	161,431	6.8%
Industrial	74,781	3.2%
Government	-	0.0%
Total Natural Gas	720,504	30.5%
Transportation		
Gasoline (3)	497,040	18.6%
Diesel (4)	20,729	0.8%
Total Transportation	517,769	21.9%
Total Energy at Source	2,365,459	100.0%

Notes:

- (1) Based on average heat rate of 10,500 Btu/kWh.
- (2) Based on MEC sales, plus 9.1% for natural gas losses.
- (3) Based on lower heating value of 116,000 Btu per gallon.
- (4) Based on lower heating value of 133,000 Btu per gallon.

City-Wide Emissions Inventory

Table III-7 shows the consolidated CO2 emissions inventory for the City, taking into account electric fuel use, natural gas consumption, and transportation. The inventory does not take into account emissions from cement production, which is a significant non-energy related source of CO2 emissions. Incidental activities, such as outside cooking and wood burning, are also not included.

**Table III-7
Summary of CO2 Emissions Inventory**

Fuel / Sector	Emissions	
	(MT CO2)	(%)
Electricity		
Residential	38,923	22.8%
Commercial	31,910	18.7%
Industrial	10,756	6.3%
Government	8,153	4.8%
Total Electric	89,742	52.6%
Natural Gas		
Residential	26,486	15.5%
Commercial	8,829	5.2%
Industrial	4,090	2.4%
Government	-	0.0%
Total Natural Gas	39,405	23.1%
Transportation		
Gasoline	40,143	23.5%
Diesel	1,276	0.7%
Total Transportation	41,419	24.3%
Total Emissions	170,566	100.0%
Sequestration Rate (acres/MT CO2) (1)		
Low Rate	2.2	
High Rate	9.5	
Afforestation Required (acres)		
Low Rate	77,530	
High Rate	17,954	

Notes:

- (1) Based on "Representative Carbon Sequestration Rates and Saturation Periods for Key Agricultural & Forestry Practices," June 2010. Converted from MT C to MT CO2.
<http://www.epa.gov/sequestration/rates.html>

CO2 emissions related to energy use in the City were estimated to be approximately 171,000 tons per year. Electric energy accounted for 53% of CO2 emissions, natural gas accounted for 23% of CO2 emissions, and transportation accounted for 24% of CO2 emissions.

One method to visualize the City's CO2 emissions is to put it in terms of how many acres of trees would need to be planted to sequester the carbon emissions. According to the Environmental Protection Agency (EPA), one acre of afforestation, defined as establishing a forest on land that was previously used for cropland or pasture, will sequester 0.6 – 2.6 metric tons of carbon per acre per year. This equates to 2.2 – 9.5 metric tons of CO2 per year per acre. Completely sequestering the City's CO2 emissions would require conversion of 17,000 - 78,000 acres of cropland or pastureland to forestland. This equates to an area of 28 - 121 square miles. The area of the City is approximately 9 square miles; it would require an area of 3 to 12 times the current size of the City to sequester IMU's current CO2 emissions.

End Use Profiles

One of the goals of the study was to determine energy conservation and sustainable resources that would reduce the City's consumption of non-renewable energy resources. In addition to collecting retail sales information, three other sources of data were used to determine end use load patterns:

- A survey was prepared for the City's residential customers, asking questions about heating, cooling, water heating, insulation, other appliances, lighting, plug load, and demographic information. The purpose of the survey was to identify trends that would enable the City to target energy conservation to those uses of energy that have the highest potential to cost-effectively reduce energy consumption. By collecting demographic information, promotion of incentives can be targeted to age groups or income levels that are not currently implementing energy conservation measures.
- To collect more detailed information, 47 whole-house energy audits were completed. The audits were conducted by a third-party vendor as part of a collaborative effort with MEC that has been used to jointly complete audits within the IMU service territory for several years. The audits collect detailed information affecting energy usage, including HVAC information, insulation levels, lighting, water heating efficiency and usage, windows, doors, air infiltration, and plug-in loads.
- Audits were completed for 45 commercial customers. Commercial customers tend to have different load patterns and energy savings opportunities than residential customers, including lighting, heating and air conditioning controls, and energy use in commercial processes like cooking and refrigeration. Commercial customers tend to apply different economic criteria for installing energy conservation measures that takes into account cost of capital, project life cycle costs, and tax considerations. Conservation measures for

Electric

The energy survey, monthly energy usage profile, and energy audits were used to develop an understanding of electric energy usage in the IMU service territory. Other publicly available information was used to develop an understanding of the usage for various end uses for customers. Table III-8 summarizes the end use profile for the City’s residential customers.

**Table III-8
Estimated Residential Electric Usage Profile**

End Use	Energy Usage	
	kWh	%
Heating (1)	8,390,001	17.6%
Electronics (2)	7,264,565	15.2%
Cooling	5,536,797	11.6%
Refrigeration	5,244,472	11.0%
Other Uses	4,972,536	10.4%
Water Heating	4,506,361	9.5%
Lighting	4,234,425	8.9%
Clothes Dryers	3,146,683	6.6%
Other Appliances	2,330,876	4.9%
Freezers	2,020,093	4.2%
Total Energy	47,646,809	100.0%

1. Includes electric heat, miscellaneous space heating and furnace blower motors for non-electric heat.
2. Combined usage of televisions, miscellaneous electronics and computers.

Cooling load was projected based on the monthly energy usage profile for the system and a review of energy audit information. The estimated annual energy usage for cooling was 5,500 MWh, compared to 47,600 MWh of total residential energy usage. Based on this estimate, 12% of IMU’s energy sales were related to air conditioning. This calculation is shown in Appendix Table B-3.

Heating load for the electric system was based on the monthly energy usage profile for the “All-Electric” rate class, which includes customers with electric heating equipment as the primary heating source. This calculation does not include miscellaneous electric heating load from individual space heaters, baseboard heating or other small electric space heating that supplements the primary space heating fuel. Approximately 1,900 MWh of energy was related to electric space heating, which was 4% of annual energy sales to the residential class.

Energy usage for other customer uses was calculated based on profile data previously prepared for Iowa and other nearby states. A study completed by Oak Ridge National Laboratory for The Iowa Energy Center in June 2001 calculated energy use for various end use categories (S.W. Hadley, “The Potential for Energy Efficiency in the State of Iowa,” <http://www.ornl.gov/~webworks/cppr/y2001/rpt/112459.pdf>, June 2001). The data in this study is old and pre-dates a number of energy efficiency initiatives implemented on a national and state level; however, the relative percentage of energy consumption among the various end uses is reasonable.

A second study on “plug in” load was recently completed in Minnesota (Energy Center of Wisconsin, “Electricity Savings Opportunities for Home Electronics and Other Plug-In Devices in Minnesota Homes,” http://www.ecw.org/resource_detail.php?resultid=430, May 2010). The calculated load for electronics was comparable, on a per-customer basis, with the findings of the Minnesota study.

The largest uses of energy were for heating (including miscellaneous space heating and furnace motor load), electronics, and space cooling. These estimates provide insight on the measures that hold the greatest potential for energy savings. For example, measures that address heating and cooling are likely to have greater impact than measures directed at clothes dryers or freezers because each of the measures is responsible for less than 7% of energy usage. Directing energy conservation measures at heating, electronics or cooling is more likely to generate increased savings. Lighting, refrigeration, and water heating are potential areas for energy savings, particularly because there are proven energy efficiency programs that are cost effective and easily implemented.

The customer survey was used to identify characteristics of end use customers to assess the potential of various energy efficiency and conservation measures. A copy of the survey was included in Appendix C and a compilation of the survey responses was included in Appendix D. Demographic information was collected to help identify the types of customers that are already implementing energy efficiency measures and to help identify those customers that should be targeted for marketing and education.

A number of factors were calculated for the survey data and summarized in Appendix Tables B-5 and B-6 and Appendix Figures B-1 through B-5. Many of the measures did not reveal anything that was unexpected. For example, customers with higher income levels tend to have larger homes and increased energy usage. Households with more children tend to have higher energy consumption. While these findings are not surprising, understanding these factors can help IMU design programs that target those customers with the most potential for energy efficiency improvements.

Natural Gas

Table III-9 approximates the end uses of natural gas for the retail customers served by MEC. The primary uses of natural gas for residential customers in the City are space-heating, water heating and cooking. Space heating is responsible for approximately 66% of natural gas consumption, based on a comparison of summer natural gas usage to winter natural gas usage as shown in Appendix Table B-4. Other uses, including water heating, cooking and process uses for commercial customers, comprise approximately 34% of natural gas consumption.

Table III-9
Estimated Retail Natural Gas Usage Profile

End Use	Energy Usage	
	MMBtu	%
Heating	389,036	65.7%
Other Uses	203,100	34.3%
Total Energy	592,136	100.0%

The comparison of heating load to other uses was consistent with end use information collected in 2008 by the Iowa Utility Association (Quantec, “Assessment of Energy and Capacity Savings Potential in Iowa,” <http://www.thecadmusgroup.org/pdfs/iaa.pdf>, p. 28, February 2008).

Transportation

Household mileage was estimated for work, school, extra-curricular and shopping trips, based on survey responses and the total number of households. Simpson College data was estimated based on an emissions inventory prepared for the college and estimated fuel use associated with the estimated emissions. There may be some overlap with residential household survey responses, but the majority of Simpson College data would represent emissions related to non-resident employee and student commuting patterns.

City residents were projected to travel approximately 75.7 million miles per year. The vast majority of travel was related to commuting to and from work, with projected commuting miles comprising of 61.1 million miles, or approximately 81% of projected vehicle miles. Extra-curricular activities comprised 11% of vehicle miles traveled, while school and shopping represented approximately 4% of vehicle miles.

SECTION IV: COST / BENEFIT ANALYSIS

The purpose of the cost-benefit analysis is to identify energy efficiency and sustainability measures that are cost effective and can help the City reduce energy usage.

Electric

The energy survey and residential audits indicated a number of measures that would be cost effective and result in a reasonable payback period. There were a number of improvements that would reduce electric usage, including improved insulation, proper air conditioner sizing, energy-efficient lighting programs, and implementing findings of commercial/industrial energy audits.

Residential Insulation

The primary measure that provided a reasonable payback was improved insulation levels. Improved insulation reduces heating energy usage, which results in decreased electric usage for all-electric homes and decreased natural gas energy consumption for homes that use natural gas as the primary heating fuel. In homes with natural gas heating, there would be some reduced electric usage from lower use of fan motors and small space heaters. Of the 47 residential audits that were completed, 17 homes were shown to have ceiling or attic insulation that could be improved. For those homes with R22 or worse insulation, the payback period was less than six years for improving insulation to R49. While much of the payback for attic insulation would be in the form of reduced natural gas consumption, there would be some reduced electric consumption from reduced fan usage and all-electric customers.

Other electric conservation measures that were cost effective and could be widely implemented included:

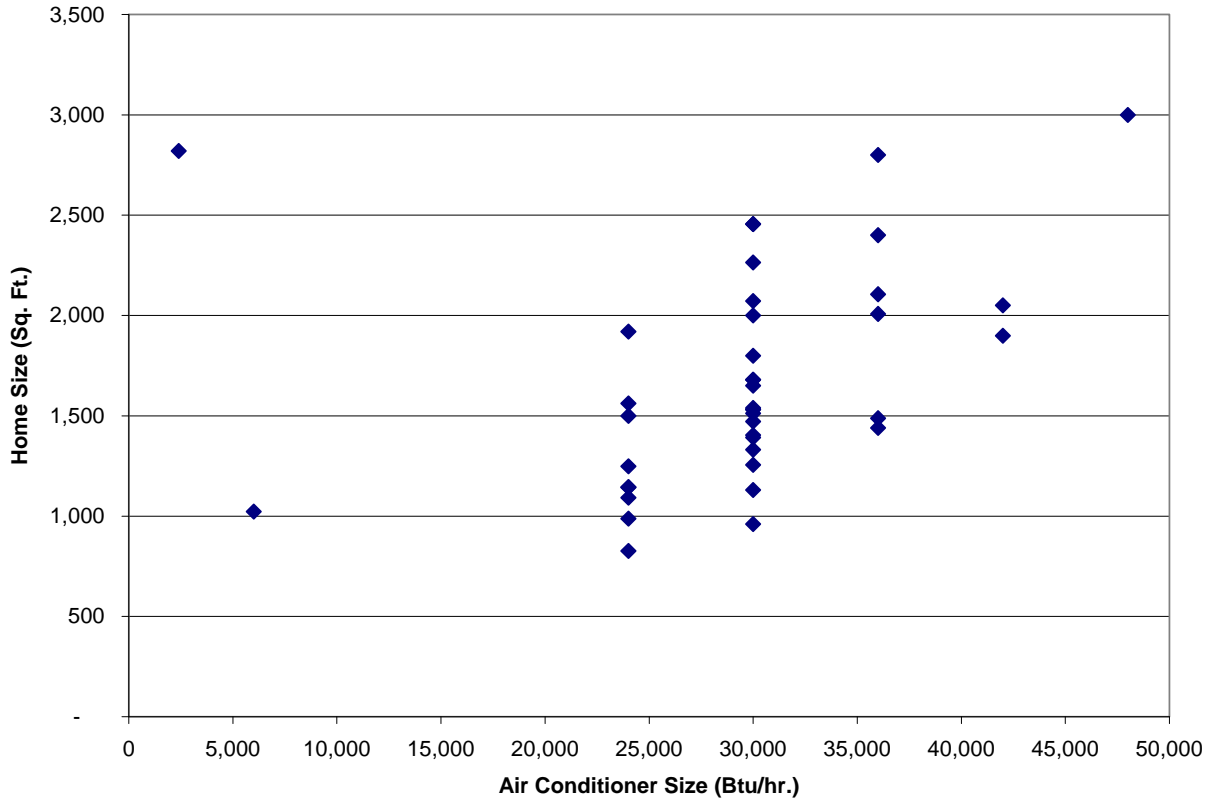
- Compact fluorescent light installation – 14 homes
- Clock thermostats – 21 homes (reduces electric and natural gas usage)
- Changing thermostat settings on clock thermostats – 8 homes (reduces electric and natural gas usage)
- Improved cooling efficiency – 6 homes (effective when equipment needs to be replaced)

Residential Air Conditioning Sizing

Another area with the potential for reducing electric usage involves the sizing of new and replacement cooling equipment. Figure IV-1 (see page 29) shows the sizing of the air conditioners that were provided by respondents to the energy survey or energy audits, compared to the square footage of the various houses. In general, larger homes have larger air conditioners; however, there is some disparity in air conditioner sizing for similarly sized houses. As an example, for 2-ton air conditioners, the house size varies between approximately 800

square feet up to 2000 square feet. There are 2000 square foot homes with air conditioners sized from 2 tons to 3.5 tons. Similar disparities exist for homes of other sizes.

**Figure IV-1
Air Conditioner Sizing
Comparison to House Size**



An oversized air conditioner has been shown in numerous studies to cause decreased comfort and increased energy usage. An oversized air conditioner cycles more frequently, which reduces efficiency since air conditioners tend to be least efficient right after startup. Frequent cycling also reduces the effectiveness of dehumidification, which is an important element of air conditioning. Oversized air conditioners tend to result in air that feels damp and clammy (U.S. Environmental Protection Agency and U.S. Department of Energy, “Heat and Cool Efficiently: Sizing and Installation,” http://www.energystar.gov/index.cfm?c=heat_cool.pr_properly_sized).

A number of studies have tried to estimate the impact of improperly sized air conditioning equipment. Studies completed in the late 1990s have indicated that proper sizing can reduce

energy consumption by 2-3%. Another benefit of proper sizing is reduced equipment costs for the customer. Reduced cycling of oversized air conditioners can also improve equipment life by reducing the number of equipment start cycles when failures are more likely to occur (U.S. Environmental Protection Agency, “Right-Sized Air Conditioners,” http://www.energystar.gov/ia/new_homes/features/RightSizedAC1-17-01.pdf).

A number of communities require air conditioning contractors to submit a cooling load analysis prior to issuance of a building permit for new homes. The City of West Des Moines is one example of a city that has made the completion of sizing calculations part of the building permit application process. West Des Moines requires completion of the Department of Energy’s “REScheck” software analysis to ensure that the applicable energy conservation codes are being followed. (<http://www.wdm-ia.com/Modules/ShowDocument.aspx?documentid=334>). An element of RESCheck is the calculation of cooling load and proper sizing of equipment

Waverly Light and Power (Waverly) has implemented procedures to help ensure that new and replacement air conditioning is properly sized. Its “New Home Building Standards” and “Feel Great Rebates” programs help ensure that new homes have heating and cooling system sizing calculations reviewed prior to construction (<http://wlp.waverlyia.com/residential/energy-efficiency-opportunities/new-home-building-standards.aspx>).

A savings of 2-3% of cooling energy is relatively small and would not provide a 1% overall reduction of energy usage for the City. The cost benefit analysis for this approach would result in positive economic benefits. The cost to implement this measure is negligible because contractors and homebuilders are already required to comply with these requirements. If customers install smaller air conditioners than had previously been installed, there would be capital cost savings to end use customers. Finally, reduced energy usage would be achieved during peak conditions, reducing peak demand and transmission service charges.

The City could implement improved air conditioner efficiency for existing homes by making completion of a cooling load calculation a condition of receiving rebates from the Utility. The existing rebate program provides an incentive to install high-efficiency electric heating and cooling equipment.

Residential Lighting

The energy audits found a significant number of homes that could benefit from conversion to compact fluorescent light bulbs (CFLs). Of the homes audited, 14 of 47 (30%) could reduce energy usage by converting to CFLs. Typical CFLs use 60-80% less energy with a lifespan of five to seven times as long as a conventional incandescent light bulb.

The energy survey showed that 33% of households did not have any compact fluorescent lights. Table IV-1 (see page 31) shows a breakdown of the energy survey responses related to lighting. Lower income households are less likely to have CFLs installed than higher income households.

Nearly 46% of households with annual income of less than \$25,000 have no CFLs installed. This compares to 25% of households with income of \$75,000-\$100,000 and 28% of households with income greater than \$100,000 per year. This finding indicates that IMU may want to target its efforts for CFL conversion toward lower income households.

**Table IV-1
Homes with Compact Fluorescent Lighting
Residential Class – Electric
City of Indianola**

Annual Income	Households			
	With CFLs	Total Responses	% with CFLs	% without CFLs
< 25,000	20	37	54.1%	45.9%
> 25,000, < 50,000	39	61	63.9%	36.1%
> 50,000, < 75,000	32	47	68.1%	31.9%
> 75,000, < 100,000	33	44	75.0%	25.0%
> 100,000	38	53	71.7%	28.3%
Total	162	242	66.9%	33.1%

Customer Group	Number of Fixtures			
	CFLs	Total Fixtures	% with CFLs	% without CFLs
Survey (1)	2,970	10,399	28.6%	71.4%
Residential Class (2)	55,527	194,418	28.6%	71.4%

1. Based on 286 survey responses.
2. Extrapolation of survey responses to full customer base.

CFLs implementation has a favorable payback period of less than one year, based on payback calculation methodologies prepared by Energy Star and updated for IMU’s wholesale cost structure (see Appendix Table B-7). If 90% of the fixtures in IMU’s service territory were replaced with CFLs, energy savings of approximately 2,800 MWh would be realized. This equates to a 2.4% reduction in total electrical energy sales and 1.1% reduction in overall energy use for the City. CO2 emissions would be reduced by approximately 1.4% based on this projection. This calculation is shown in Table IV-2 (see page 32).

Much of the savings from CFL conversion would be achieved regardless of action by IMU or the City. The Energy Independence and Security Act of 2007 mandated the phase-out of incandescent light bulbs, beginning in 2012 for 100-watt bulbs and 2014 for 40-watt bulbs. There are exceptions for three-way bulbs, reflective floodlights, rough service lights, appliance

lights less than 40 watts and a number of other specialty lamps. In general, most incandescent residential light bulbs would be phased out under these regulations by 2014 and additional efficiency requirements would become effective in 2020. If IMU continues its CFL distribution efforts, it may be able to generate additional energy savings prior to the implementation of the increased lighting efficiency standards.

**Table IV-2
Energy Savings – Residential Lighting Programs**

Description	Amount
CFL Fixtures	55,527
Non-CFL Fixtures	138,891
Total Lighting Fixtures	194,418
Energy Use Per Fixture (kWh)	
CFL	4
Incandescent	29
Energy Use by Type	
CFL	239,563
Incandescent	3,994,863
Total Lighting Energy Use	4,234,425
Potential Savings	
Savings per Fixture	24
Market Share	80%
Incandescent Fixtures	138,891
Total Energy Savings - CFL (kWh)	2,716,507
% of Electric Energy	2.26%
Potential Savings - % of Total Energy at Source	
Projected Energy Savings (MMBtu)	25,449
Total MMBtu at Source	2,365,459
% Energy Reduction at Source	1.08%
Potential Savings - CO2 Emissions	
Electric CO2 Emissions	98,941
Projected CO2 Savings (MT)	2,234
Projected CO2 Emissions	170,566
% CO2 Emissions Savings	1.31%

Implement Commercial Audit Findings

The commercial and industrial energy audits identified a number of energy efficiency improvements. The detailed findings, including energy savings and the number of projects, are shown in Appendix Table B-8. Table IV-3 summarizes the energy efficiency improvements for commercial and industrial customers that showed a payback period of less than 10 years. Energy savings of approximately 3.9% of commercial usage could be achieved by implementing the proposed projects. Extrapolating this finding to the remainder of the commercial and industrial rate class would result in reduced energy consumption of 1.1% and reduced CO2 emissions of approximately 2,000 metric tons, or 1.2% of current emissions.

**Table IV-3
Commercial / Industrial Audit Findings
Measures with Payback Period Less than 10 Years**

Annual Income	Amount
Electric Energy Usage - Audit Sample (kWh)	9,467,734
Energy Savings - Efficiency Measures	367,391
% Electric Energy Reduction	3.88%
Extrapolation to Non-Residential Sales (1)	
Total Non-Residential Sales	62,301,079
Energy Savings - Non-Residential Class	2,417,564
Electric Energy Sales Reduction	
Energy Savings - Commercial Class	2,417,564
Total Electric Energy Sales	110,018,941
% Energy Reduction	2.20%
Potential Savings - % of Energy at Source	
Projected Energy Savings (Btu)	25,384
Projected Energy Usage (Btu)	2,393,472
% Energy Reduction	1.06%
Potential Savings - CO2 Emissions	
Electric CO2 Emissions	89,742
Projected CO2 Savings (MT)	1,972
Projected CO2 Emissions	170,566
% CO2 Emissions Savings	1.16%

1. Includes commercial, industrial and governmental rates.

Natural Gas

Improved Residential Insulation

The primary finding that would reduce natural gas usage was to improve insulation in residential customers. This finding was discussed in the electric section since there are some cross-benefits between natural gas and electric usage. Table IV-4 (see page 35) summarizes the energy savings that could be realized through improved insulation for older residential homes.

The residential audits indicated that 16 of 47 homes could benefit from improved attic/ceiling insulation. After taking into account incentives that are available, the average payback period was 8.2 years, which results in a return on investment of approximately 9%. The median natural gas usage reduction was approximately 40 Dth per home with inadequate insulation. Some of the audited customers showed a payback for attic insulation of less than two years after taking available incentives into account.

Extrapolating this finding to the remaining residential customer base of homes older than 10 years old, approximately 936 customers were projected to have inadequate insulation. Based on the median natural gas consumption savings, natural gas consumption would decrease by approximately 37,000 Dth per year, or approximately 5.0% of existing natural gas consumption. Based on City-wide energy sources, a 1.4% reduction in energy usage could be realized by implementing improved insulation. This reduction in energy usage would reduce CO2 emissions by 2,200 metric tons, or approximately 1.2%.

**Table IV-4
Energy Savings from Improved Residential Insulation**

Annual Income	Amount
Audited Homes with Inadequate Insulation	16
Total Audited Homes	47
% Homes with Inadequate Insulation	34.04%
Extrapolation to Residential Class (1)	
Total Residential Customers	3,500
% of Homes More than 10 years Old (2)	78.5%
% with Inadequate Insulation	34.0%
Customers with Inadequate Insulation	936
Natural Gas Usage Reduction	
Energy Savings - Dth / Customer (3)	35
Applicable Customers	936
Natural Gas Usage Reduction (Dth)	32,744
Total - Existing Natural Gas Sales (Dth)	660,559
% Reduction - Natural Gas Sales	4.96%
Potential Savings - % of Total Energy at Source	
Projected Energy Savings (Dth)	32,744
Projected Energy Usage (Dth)	2,393,472
% Energy Reduction at Source	1.37%
Potential Savings - CO2 Emissions	
Natural Gas CO2 Emissions	39,405
Projected CO2 Savings (MT)	1,953
Projected CO2 Emissions	170,566
% CO2 Emissions Savings	1.15%

1. Excludes commercial, industrial and governmental rates.
2. Homes less than 10 years old were not audited and should have adequate insulation based on applicable energy efficiency standards.
3. Median Dth savings for 16 audited customers with inadequate insulation levels.

Transportation

Snyder & Associates reviewed several measures that would reduce vehicle mileage, energy usage and emissions. These options are discussed in the transportation report included in Appendix A. The City of Indianola Sustainability Committee desires to evaluate methods to reduce pollutant emissions caused by transportation sources in the City.

One way is by reducing pollutants per transportation source. This is primarily by the introduction of more efficient vehicles or vehicles that use alternative, lower pollution energy sources.

The second approach is by reducing the opportunities for transportation pollution (e.g. fewer trips, miles traveled). These strategies are part of the field of “Travel Demand Management”, an approach to transportation planning that deals with various policies or programs that work to reduce overall transportation usage and, in particular, peak hour congestion. The Federal Highway Administration provides a clearinghouse of Travel Demand Management strategies. Many of these strategies are particular to highly urbanized areas where higher density can support transit, toll lanes, etc. Many strategies apply for a community such as Indianola, particularly with its high commuting base.

According to the survey, more than 80% of vehicle mileage is related to commuting. The average commute is approximately 20 miles (one way) and is typically made with only one passenger in the vehicle. Many respondents indicated that ride-sharing, walking, biking, or public transit was not a realistic alternative for a number of reasons: Scheduling conflicts, the need to use the vehicle as part of the job, distance, and convenience.

To reduce commuting miles, a proposed measure must not reduce convenience for commuters that work unusual schedules or need the vehicle for work. To increase the number of potential commuters that would walk or use a bicycle, the commute distance would have to be reduced. Public transportation is not available from the City to the primary employment centers in Des Moines; however, a number of commuters would not use public transportation options for reasons of convenience, need for vehicle or because of scheduling concerns.

Achieving meaningful energy reduction and emissions reduction from transportation measures is difficult. On a City-wide basis, transportation accounts for 22% of the City’s energy use and 24% of the City’s CO2 emissions. Many commuters indicated that it would be difficult or impossible to reduce mileage because of uncertain schedules or a need to use a vehicle during work hours. Reducing commercial and industrial mileage would be difficult without reducing business activity. To achieve a reduction of energy use on a City-wide basis of 1% by reducing vehicle miles, a reduction in vehicle miles of nearly 5% would be necessary.

Two measures from the Snyder & Associates study appeared to have a favorable cost/benefit profile, in that the cost of CO2 emissions reduction was less than \$100 per ton. These measures would be relatively easy to implement. The measures are expanded ride-sharing and replacement of police vehicles with hybrid cars. A third measure, the use of satellite offices, was identified in meetings with IMU and the Indianola Sustainability Committee, was separately evaluated and appears to have a favorable cost/benefit profile, although the upfront costs and planning would be greater than ride-sharing programs or police vehicle replacement.

Satellite Office

One approach to reduce commuter mileage would be to provide reasonable options for telecommuting and satellite offices for major Des Moines employers. There may be some significant costs to developing satellite offices, but savings in transportation costs and time spent commuting for employees would offset a portion of the costs. To make this approach successful, adequate infrastructure would be necessary, including:

- Office space
- Telecommunications infrastructure, including teleconferencing capability
- Location with easy access to local highways
- Utilities service

There are a number of cost implications to pursuing this approach, and the determination of the development costs for this approach was beyond the scope of this report. Table IV-5 (see page 38) is a cursory cost/benefit based on typical office rental rates in the City and projected savings from shorter commuting distances. This analysis is based on the following parameters:

- Rental cost of \$12 per square foot, per year, based on typical lease rates in the Indianola/Des Moines area.
- Annual operating costs of \$4 per square foot for office space.
- Satellite office for 100 employees, with 225 square feet of space per employee.
- Reduction in commuting distance of 35 miles per workday for 250 workdays per year, based on a reduction from 40 miles round-trip to 5 miles round-trip.
- Cost of \$0.50 per mile for commuting, based on IRS business reimbursement rate.

The projected cost of office space would be \$360,000 per year. This compares to reduced commuting costs of \$437,500 per year. This comparison does not take into account reduced office rental expenses caused by relocating employees from a main office to the satellite office. This cost projection is based on high-level estimates from commercial real estate listings and subject to significant uncertainty and market conditions.

Relocating 100 employees from downtown Des Moines to the City would reduce annual commuter mileage by 875,000 miles per year, which would reduce total vehicle mileage by

1.16%. This reduction in commuter miles would reduce energy use at the source by approximately 5,700 MMBtu, or approximately 0.24% of the total energy consumption for the City. Table IV-5 also summarizes the energy savings and cost/benefit analysis associated with reducing commuter miles by creating satellite office opportunities.

Public transit options between the City and downtown Des Moines may reduce commuting expense. In the past, Warren County and the City have evaluated the feasibility of becoming part of the Des Moines Area Regional Transit Authority (DART). In past evaluations, the cost to taxpayers and commuters was deemed to exceed the benefits from reduced commuting and traffic congestion costs. The City and Warren County may want to evaluate the costs and benefits of becoming part of the DART system.

**Table IV-5
Energy Savings – Reduced Commuter Mileage
Through Use of Satellite Offices**

Description	Amount
Projected Annual Rental Cost	
Space per Employee (sq. ft. / employee)	225
Number of Employees	100
Office Space Lease Cost (\$/sq. ft/year)	12.00
Utilities / Operating Cost	4.00
Annual Office Cost	\$ 360,000
Avoided Commuter Cost	
Reduced Mileage (miles/year)	875,000
Cost per mile (\$/mile)	\$ 0.50
Value of Reduced Commuting	437,500
Reduced Cost from Satellite Office	(77,500)
Reduced Energy Usage	
Mileage Reduction	875,000
Existing Mileage	75,702,740
Existing Vehicle Energy Usage (MMBtu)	497,040
Reduced Energy Usage (MMBtu)	5,745
Reduced CO2 Emissions	
Existing Vehicle Emissions	40,143
Vehicle Emission Reduction	464
Total CO2 Emissions	170,566
Overall Emission Reduction (% of total)	0.27%

Ride Share

Survey results indicated most of these residents drive single-occupancy vehicles to accomplish these trips. Increased rideshare through car-pooling and van-pooling would reduce number of trips and therefore emissions.

DART provides support for carpool and vanpool (up to 15 passenger in a van) services, including van inventory, ride-matching, and emergency rides home. According to DART, there is one van-pool currently organized from Indianola to Des Moines.

If 500 area commuters (20% of estimated Des Moines commuters) were able to use ride-sharing, there would be a net reduction in gasoline consumption of 213,400 gallons. This would result in a reduction in energy usage of 24,754 MMBtu (approximately 1.0% of total energy use for City) and reduce CO₂ emissions of 1,900 metric tons per year. Additional information on the assumptions and calculations for this analysis are provided in Appendix A.

Hybrid Police Vehicles

City Police and County Sheriff vehicles log many miles in patrol and response driving, and therefore contribute a high percentage of Public Agency emissions in the community. A large percentage of these miles are in stop-and-go traffic or low speed patrol of neighborhood areas, which are ideal operating conditions for hybrid vehicle operations. Numerous articles were found discussing police departments in other cities replacing their police fleets with gasoline/electric hybrid vehicles.

It was estimated that 40 metric tons per year of CO₂ emissions could be avoided by using hybrid police vehicles. The estimated upfront cost was \$10,500, based on incremental vehicle cost. The cost of avoided CO₂ emissions for this strategy based on a five-year life cycle was \$53 per ton. While the overall energy consumption reduction was low, this measure provides cost-effective CO₂ emissions reduction. This measure has the added effect of reducing fuel consumption costs. This measure can be implemented at the City department level without requiring any changes in behavior by commuters or customers. Additional information about this measure is provided in Appendix A.

Energy Resources

The energy conservation measures identified for each utility requires action by customers or third parties to implement. For example, a program to provide incentives for attic/ceiling insulation would still require the customer to hire a contractor to install insulation. Distribution of CFLs still requires a customer to install them. Reducing commuter mileage would require residents to use public transportation or a third party to locate a satellite office in the City.

Implementing sustainable energy resources for the electric utility is one measure that does not require action by individual customers. The IMU Board of Trustees has previously purchased

renewable energy resources through its wholesale purchased power agreement with MEAN and could increase these purchases in the future.

Wind Purchases

IMU currently purchases 4% of its energy from wind. The current cost of wind energy purchased from MEAN is approximately 4.7¢/kWh. The cost structure of MEAN's renewable energy portfolio does not provide for capacity credits, which results in incremental cost for wind energy of approximately 2.5¢/kWh. Wind energy has no direct CO₂ emissions, but production from wind energy is intermittent and may not be available at the time of the City's peak demand.

The City's existing wind purchases offset approximately 46,000 MMBtu of energy consumption and 3,600 metric tons of CO₂ emissions. The incremental cost of wind energy is approximately \$120,000 compared to the conventional resources purchased under the Service Schedule M agreement from MEAN. Based on the calculated incremental cost of wind energy, the cost per ton of avoided CO₂ emissions is approximately \$33.50 per ton.

Landfill Gas

IMU has been approached about participating in a landfill gas to electrical energy project. Methane is a major component of landfill gas and is thought to be a significant greenhouse gas with an intensity of approximately 21 times that of CO₂ on a per-pound basis. Landfill gas projects require no incremental fuel and have a negative carbon footprint if the methane removal is considered.

A landfill gas to energy project typically consists of a methane collection system, an internal combustion engine, and an electric generator. Methane from the landfill is used to fire the engine and generate energy. The variable fuel cost is essentially zero, since the methane is either vented to the atmosphere or flared off (burned without converting heat to usable form of energy). Capital costs are typically \$2,000–\$2,500 per kW, which is more than a conventional peaking unit; however, landfill gas projects typically operate at a very high capacity factor, usually above 90%.

The incremental cost of energy from the landfill gas project is comparable to that of wind; however, the energy is available year-round and the project would reduce the equivalent carbon footprint of the City. Based on projected gas consumption data and 75% collection efficiency, the project would likely reduce CO₂-equivalent emission by approximately 6.88 pounds per kWh produced, compared to existing emissions of 1.64 pounds per kWh. The net CO₂-equivalent reduction from a 1 MW landfill gas project would be approximately 32,200 metric tons, which is 18.9% of the City's existing CO₂ emissions. The cost of this CO₂ reduction is the equivalent of \$6.23 per metric ton.

This approach to reducing greenhouse gas emissions is very cost effective compared to wind energy and conservation. In a “cap and trade” environment that would mandate reduced CO2 emissions, some utilities have estimated the equivalent cost of CO2 emissions credits would cost \$10-\$50 per ton. A landfill gas project would have favorable economics compared to these cost estimates.

Before the City or IMU pursues a landfill gas project, the ownership of CO2 offsets should be clearly identified. The actual project design may result in a different CO2 offset calculation, depending on collection efficiency, oxidation factors and thermal efficiency of the project. These factors should be considered as part of the economic and environmental due diligence of this type of project.

Customer-Owned Renewable Generation

Some IMU customers have indicated an interest in customer-owned renewable generation. These projects typically take the form of a small-scale wind turbine or rooftop solar array. The small scale of these projects typically results in production costs of 8¢-10¢/kWh, compared to 4.5¢-6¢/kWh for large-scale wind or landfill gas projects. In addition, a large number of projects would be necessary to generate the same amount of energy. Existing wind energy is supplied from approximately 1.75 MW of turbine capacity. If 25 kW small-scale turbines were used to supply the equivalent amount of capacity, more than 70 turbines would be required. This many small-scale turbines could cause operational issues, particularly for energy scheduling, as well as present zoning and permitting issues to the City.

Based on a cost of 8¢/kWh for small-scale renewable energy, the cost to provide the same benefits as the City’s existing wind energy purchase would be approximately \$280,000. This incremental cost is \$160,000 more than the existing incremental cost of wind energy purchased from MEAN from the renewable resource pool.

Small-scale renewable projects also result in a much higher cost of CO2 emissions reduction than landfill gas or large-scale wind purchases. The cost of CO2 emissions reduction is approximately \$78 per ton, compared to \$33.52 for wind energy and \$6.23 for small-scale renewable resources.

Economic Comparison

Table IV-6 (see page 42) summarizes the cost of renewable energy from wind, landfill gas, and local small-scale wind resources. Table IV-7 (see page 43) calculates the impact on energy usage and CO2 emissions. In general, large-scale projects cost less than small-scale, locally connected projects. Landfill gas projects provide CO2 emission mitigation by reducing methane emissions.

**Table IV-6
Cost of Renewable Energy**

Description	Wind	Landfill Gas	Small Scale Renewable Resources
Annual Energy Purchases (MWh)	120,319	120,319	120,319
% of Energy from Resource	4.0%	6.9%	4.0%
Energy from Resource (MWh)	4,800	8,322	4,800
Resource Information			
Capacity (MW)		1.00	
Capacity Factor (%)		95%	
Annual Energy (MWh)	4,800	8,322	4,800
Debt Service			
Installed Cost (\$/kW)	0	3,000	0
Total Installed Cost (\$)	0	3,000,000	0
Financing Term (years)	0	15	0
Interest Rate (%)	0	6.5%	0
Debt Service Cost (\$/year)	0	319,058	0
Fuel Cost			
Heat Rate (Btu/kWh)		12,000	
Fuel Cost (\$/MMBtu)		\$ -	
Fuel Cost (\$/MWh)		\$ -	
Operation and Maintenance Cost			
Fixed O&M (\$/kW-year)	-	110.97	-
Variable O&M (\$/MWh)	47.00	-	80.00
Production Tax Credit (\$/MWh)	-	20.00	-
Repairs and Replacement (\$/yr)	-	120,000	-
Annual Cost			
Fuel	0	0	0
Fixed O&M	0	110,970	0
Variable O&M	225,600	0	384,000
Repairs/Replacements	0	120,000	0
Debt Service	0	319,058	0
Production Tax Credit	0	(166,440)	0
Avoided MEAN Cost	105,600	183,084	105,600
Subtotal Incremental Costs	120,000	200,504	278,400
\$/MWh	25.00	24.09	58.00

**Table IV-7
Equivalent Cost of Emission Reductions**

Description	Wind	Landfill Gas	Small Scale Renewable Resources
Emission Factor			
lbm/kWh	0.00	(6.88)	0.00
MT/MWh	0.00	(3.12)	0.00
Energy / Emission Reduction			
Existing Energy Usage (Electric)	1,127,186	1,127,186	1,127,186
Existing Emissions (Electric) (MT)	89,742	89,742	89,742
Reduction in Energy Usage (MMBtu)	(44,968)	(77,963)	(44,968)
Reduction in Emissions (MT CO2) (1)	(3,580)	(32,188)	(3,580)
Percentage Reduction (City-Wide)			
Existing Energy Usage (City)	2,365,459	2,365,459	2,365,459
Existing Emissions (City) (MT)	170,566	170,566	170,566
Energy Usage	-1.90%	-3.30%	-1.90%
CO2 Emissions	-2.10%	-18.87%	-2.10%
Incremental Cost of Emissions Reduction			
Incremental Cost	120,000	200,504	278,400
CO2 Reduction (MT/year)	(3,580)	(32,188)	(3,580)
Cost of CO2 Reduction (\$/MT)	33.52	6.23	77.76

1. Based on emission factor of resource compared to existing MEAN emission factor of 1.64 lbm/kWh.

SECTION V: POLICY GUIDELINES

Summary of Potential Policies

Nine potential policies were found to be cost effective and had the potential to reduce non-renewable energy use and emissions by 1% from existing levels. These policies are summarized in Table V-1. If all of the proposed measures were implemented, energy consumption at the source would be reduced 10.0% and CO₂-equivalent emissions would be reduced by 44,300 tons, or 26.0%.

**Table V-1
Summary of Cost-Effective Measures
Energy Savings and CO₂ Reductions**

Measure		
	MMBtu	CO ₂
Existing System	2,365,459	170,566
Efficiency Measures		
Residential Lighting	25,449	2,234
Commercial Audit	25,384	1,972
Residential Insulation	32,744	1,953
Subtotal - Efficiency	83,577	6,159
Transportation		
Satellite Office	5,745	464
Ride Share	24,754	1,900
Hybrid Police Cars	520	40
Mass Transit	-	-
Subtotal - Commuting	31,019	2,404
Sustainable Resources		
Landfill Gas	77,963	32,188
Wind Energy	44,968	3,580
Subtotal Resources	122,931	35,768
Total Reductions	237,527	44,331
% Reduction	10.0%	26.0%

Implementing all of the proposed measures may not be practical because of funding limitations, customer acceptance, reliability concerns, or other issues. The total capital cost of all the selected measures was more than \$11.2 million. This amount would likely be less if purchased power agreements were signed for the landfill gas and wind projects. To help narrow down the list to select preferred options, the policies were rated on several objective and subjective criteria to help the City identify the preferred measures for future sustainable energy development. Table V-2 (see page 45) summarizes the ranking of the various criteria for each of the proposed

policies. While this ranking system is not intended to be a scoring system, it can be used to identify those options that have higher likelihood for success.

**Table V-2
Summary of Cost-Effective Measures
Energy Savings and CO2 Reductions**

Proposed Measure	Cost	Screening Assessment (1)				
		Customer Acceptance	Ease of Implementation	Cost / Benefit Analysis	Environmental Impacts	Operational Impacts
Efficiency Measures						
Res Lighting (2)	330,000	Fair	Fair	Excellent	Good	Excellent
Comm Audit (2)	2,700,000	Fair	Fair	Excellent	Good	Excellent
Res Insulation (2)	540,000	Good	Fair	Excellent	Excellent	Excellent
Transportation						
Satellite Office (3)	1,500,000	Good	Poor	Good	Good	Good
Ride Share (4)	540,000	Fair	Fair	Good	Good	Good
Hybrid Police (5)	10,500	Fair	Good	Good	Good	Good
Mass Transit	-	Fair	Fair	Fair	Good	Good
Sustainable Resources						
Landfill Gas (3)	3,000,000	Good	Excellent	Excellent	Excellent	Excellent
Wind Energy (3)	2,500,000	Excellent	Fair	Good	Excellent	Fair
Total	11,120,500					

Notes:

- (1) Ratings Assigned: Excellent, Good, Fair, Poor.
- (2) Total upfront cost of complete implementation without regard to funding source (customer, utility, third party grants, third party rebates).
- (3) Based on upfront capital cost of measure. Alternative arrangements (lease, purchased power agreement) may spread capital cost over term of agreement.
- (4) Total cost over five years.
- (5) Total cost over five years, incremental vehicle cost only, based on replacement with hybrids when police vehicles would have been replaced.

The City should consider implementing the listed measures as funds become available and based on customer interest.

Lessons Learned

An important part of this study process was to note issues identified during data collection, analysis, and report preparation. This is important for other cities and utilities that may want to pursue a similar project for evaluating energy conservation and sustainable energy projects. While none of the issues prevented the project from being completed, other cities may be able to avoid some of the issues that were encountered.

Survey

Approximately 270 surveys were collected from residential customers. This was less than the original goal of 400 surveys. In Appendix Table B-9, the estimated margin of error based on the smaller sample size was estimated and found to be less than 8%. A sample size of 400 would have resulted in a slightly lower margin of error, but the change in margin of error was relatively small. An analysis of the sample (also shown in Appendix Table B-9) demonstrated it was random and the results can be relied on as representative of the residential customer base.

One question that caused some confusion was on the number of non-dimmable light fixtures and CFLs. Some respondents interpreted the question incorrectly to mean non-dimmable fixtures without CFLs and non-dimmable fixtures with CFLs. This resulted in some respondents indicating they had more CFLs than total non-dimmable light fixtures. Some additional follow-up was completed to clarify the responses to this question. Clearer wording for this question in future surveys would be useful.

In some cases, student interns assisted customers in filling out the survey forms. One issue that came up was that some responses collected by the student interns were difficult to read because the writing was illegible. Most of the difficulty was in deciphering the entry of serial numbers for air conditioning and heating equipment. If surveys are completed in the future with temporary assistance, the surveying utility may want to consider using computer entry or ensuring that handwriting is legible.

Audits

For the most part, the audit process went smoothly. The commercial audits, in particular, were easy to understand and summarized by the auditor in a manner that provided data that could be sorted and was easy to understand.

Two primary issues were identified in completing the audits:

- The first issue had to do with customer willingness to participate in the audit where the owner of the building requested the audit, but the tenant (which was the utility customer) did not want to cooperate. The tenant in this case was a Federal agency and was not willing to provide assistance or answer questions. Situations like this should be handled

- The second issue was the increasing number of large companies with multiple locations that use centralized energy efficiency planning. Many customers that are part of national chains rely on their corporate offices to complete energy audits and install efficiency measures. Other utilities that serve large companies should not be surprised if there is a lack of cooperation from the customer and an unwillingness to participate in utility-provided energy audits or surveys.

Another issue for large companies is the standardization of buildings on a company-wide basis. This standardization can make it difficult to encourage customers to install efficiency measures, even if they are cost effective. Large companies also tend to allocate capital for energy efficiency to those projects with the shortest payback periods. IMU's electric rates are relatively low compared to other regions, so large companies will typically allocate energy efficiency dollars to other locations with higher rates and shorter paybacks.

Data Collection

The primary issue that came up with data collection involved natural gas usage data for individual customers. While IMU operates the electric utility, the natural gas utility is operated by MEC. The original survey did not include a release form that authorized MEC to release natural gas billing data to IMU. A follow-up request was made to survey respondents asking for permission for MEC to release natural gas usage data to IMU. Several survey respondents did not provide the release form. The individual customer data for natural gas usage was not an essential piece of data to complete this analysis; however, having a more complete set of natural gas consumption data may have been useful for additional analysis of individual customer patterns for natural gas consumption.

Customer Priorities

There is a wide range of customer interest and involvement in energy efficiency and sustainability. The attitudes range from high interest in installing energy efficient projects, even if the measures are not costs effective, to those that review projects on an economic basis and only install those projects that have favorable paybacks.

For example, Simpson College is very active in implementing energy efficiency projects. Sustainability and environmental impacts have become a part of the college selection process for many students and the college president has made it a goal that all future projects have zero carbon footprint. In addition to energy conservation, water conservation is an important part of planning for future projects. In some cases, Simpson College has made improvements that may

not provide a reasonable payback, but provide tangible benefits in the form of reduced energy use or CO2 emissions.

On the other end of the spectrum, one commercial/industrial customer that was interviewed indicated that energy efficiency projects are reviewed on the same basis as any other project at the facility. A strict economic analysis is prepared to determine if there is a favorable payback. Projects compete for limited capital funding with other facilities and only those projects that have the shortest payback periods are funded. As an example, high-efficiency lighting has been installed in the warehouse as funds are available. The payback period for commercial lighting upgrades is typically less than three years, but only a portion of the mercury vapor lighting has been replaced.

IMU may want to consider programs to help customers fund projects that have shorter payback periods. If repayment plans or a “performance management” contract can be developed, energy efficiency improvement projects may be able to be implemented even in cases where corporate funding is not available. There are a number of private companies that provide performance management contracts on a for-profit basis; however, these private companies keep a significant portion of the benefits from reduced energy costs.

APPENDIX A: SNYDER & ASSOCIATES TRANSPORTATION ANALYSIS

TRANSPORTATION ENERGY ANALYSIS

Prepared by:

Snyder & Associates, Inc.

Prepared for:

Indianola Municipal Utilities
City of Indianola

September 23, 2010

The Indianola Sustainability Committee is comprised of members of the City staff, Indianola Municipal Utilities, Simpson College and other citizens and stakeholders. On behalf of this committee, Indianola Municipal Utilities (I.M.U.) is conducting a comprehensive energy analysis of the community, including transportation energy usage. Part 1 of this report summarizes transportation energy use data collected in this effort to estimate fuel consumption by various sectors of the Indianola community. The fuel consumption data is then converted to annual emissions of carbon dioxide. In Part 2, public policy alternatives that may lead to a reduction in energy and emissions are discussed.

PART 1: TRANSPORTATION ENERGY USAGE AND CO2 EMISSIONS

Data Collection

I.M.U. used surveys to collect data from three transportation sectors of the City of Indianola: household transportation, businesses and public agencies. The results of this data summarize estimated fuel usage (gallons of gasoline and diesel) and resulting carbon dioxide (CO₂) emissions from transportation uses in the City of Indianola.

Due to the various data collection sources and methodologies which differed depending on sector of transportation users, the data are broken down by the various public and private transportation users. Approximately 250 surveys were completed from residential households in the City, 25 surveys from businesses, and Warren County and City public agency data was collected and provided by I.M.U.

Calculations

Using methodology from the U.S. Environmental Protection Agency¹, the following assumptions are made:

- One gallon of gasoline produces 19.4 pounds of carbon dioxide (CO₂),
- One gallon of diesel produces 22.2 pounds of CO₂.
- Calculated pounds of CO₂ should be multiplied by (100/95) to account for contributions by other greenhouse gases.

The various data sets described below were summarized to provide estimates of annual total gallons of gasoline and diesel, and those totals were used to calculate annual CO₂ emissions by the following equation:

$$\text{Annual Metric Tons of CO}_2 = \frac{[(\text{Gallons Gasoline} * 19.4 \text{ lbs CO}_2/\text{Gal}) + (\text{Gallons Diesel} * 22.2 \text{ pounds CO}_2/\text{Gal})] * (100/95) * (1 \text{ metric ton} / 2204.62 \text{ lb})}{1}$$

Transportation Energy Usage Results/Discussion

Household Transportation Sources

Household data collection included surveys of approximately 250 City of Indianola households. The residential data collection effort focused on four areas of household transportation: commuting trips, school trips, extra-curricular activity trips and shopping trips. The survey collected data by household for up to four vehicles, collecting information about fuel type and efficiency of each vehicle, as well as mileage driven per vehicle for each trip type.

¹ United States Environmental Protection Agency. "Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle." EPA420-F-05-004, February 2005 <http://www.epa.gov/oms/climate/420f05004.htm>

While this does not account for all private vehicle mileage driven by City residents (e.g. long trips on weekends, etc), it does account for a high percentage of daily trips within the City. These “daily trips” surveyed are also the most likely to be reduced by policy or behavior changes. Survey data were averaged per household, and then multiplied by number of households in the City for citywide totals.² Table 1 below summarizes annual household and citywide vehicle mileage, fuel use and carbon dioxide emissions.

Table 1
Household Vehicles Energy Use and Emissions

	Miles					Gallons				
	TOTAL	Work	School	ExtraCirr	Shopping	TOTAL	Work	School	ExtraCirr	Shopping
Survey Households AVG	13,446	10,844	567	1,543	493	620	498	28	72	22
Survey Total	3,603,612	2,906,195	151,920	413,411	132,086	166,153	133,560	7,502	19,313	5,778
CITYWIDE	75,702,740	61,051,780	3,191,450	8,684,720	2,774,790	3,490,450	2,805,760	157,590	405,720	121,380
TOTAL CO2 EMISSIONS/ YEAR (metric tons)						30,760	24,730	1,390	3,580	1,070

Business Transportation Sources

Business trips were assumed to be divided into two types: freight/inventory trips and non-inventory (person) trips. Inventory trips are variable and determined by companies based on demand, shipping cost other factors, and were therefore agreed to **not** be included in this analysis. Therefore, the survey for this analysis focused on the non-inventory trips, such as person trips in a company fleet vehicle.

Of the 25 businesses surveyed, three responded they used fleet vehicles. However, all three of these could be understood as types of “inventory trips”, as one business used three vehicles for event catering and two others were health care and used to transport patient/residents. Therefore, since the relevant “non-inventory” business mileage appears to be miniscule and the purpose of this analysis is to prioritize viable alternatives to decrease energy use, the survey indicated business mileage data would not be further analyzed.

Public Agency Transportation Sources

A variety of data sources were gathered to develop public agency data, including data from the bulk fuel station used by City, School District and County vehicles, as well as an inventory of vehicles per public agency department. The level of detail of data for these three public agency areas varied, and the assumptions and results of fuel used and CO2 emissions by each Public Agency type are summarized below.

Public Agency – Indianola Community School District

Indianola Community Schools data collected included monthly fuel sales to the school district, and a summary of the school fleet with respect to vehicle type and fuel used. The fleet had a breakdown of 67% diesel fuel vehicles, and 33% gasoline fuel vehicles, and this was assumed for emission calculations by gallon. Fuel and CO2 emission calculations are summarized below in Table 2.

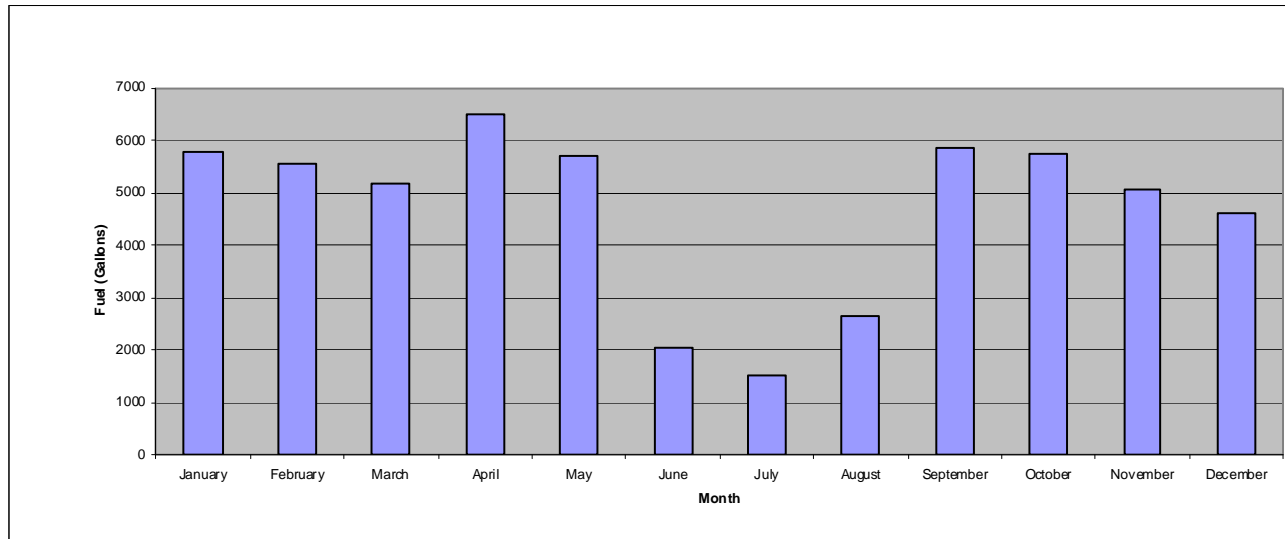
² The 2000 U.S. Census counted a population of 12,998 and 4,981 households. A special 2005 census counted 14,156 population. This population growth was assumed through 2010 and same ratio applied to households, resulting in 5,630 households). “Revised 2000 Census Population and Housing Counts for Iowa Places and Counties”. State Data Center. State Library of Iowa. <http://data.iowadatascenter.org/datatables/State/stcorrections2000.pdf>

Table 2
Indianola Comm. School District Vehicles Energy Use and Emissions

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Gallons of Fuel (Gasoline and Diesel)	5,775	5,552	5,170	6,514	5,714	2,054	1,510	2,637	5,841	5,736	5,072	4,623
TOTAL (Gallons)	56,200											
CO2 EMISSIONS (metric tons)	56	54	50	63	55	20	15	26	57	56	49	45
TOTAL CO2 EMISSIONS/ YEAR (metric tons)	550											

School district fuel purchases by month are shown in Chart 1 below. As expected, the fuel use was lowest in summer and relatively even throughout the school year, with variations likely attributable to mileage variation due to extra-curricular activities, etc.

Chart 1
Gallons of Fuel Purchased by School District



Public Agency – City of Indianola

Available City of Indianola data included vehicle type and monthly gasoline or diesel purchases for each vehicle of the various City departments. These data are summarized in Table 3 below in terms of gallons of gasoline and diesel fuel used by each City department, as well as CO2 emissions produced.

Table 3
City of Indianola Transportation Energy Use and Emissions

	B&Z	Streets	Police	Fire	Parks & Rec	Electric	Water	Sewer
Number of Gasoline Vehs	1	6	9	2	4	12	6	7
Number of Diesel Vehs	0	15	0	14	10	7	3	3
Gasoline (gal)	389	3,440	13,564	1,634	2,686	4,267	3,315	3,235
Diesel (gal)	0	13,769	0	6,280	1,468	3,316	494	1,350
TOTAL GALLONS	389	17,209	13,564	7,914	4,154	7,583	3,809	4,585
CO2 EMISSIONS/YEAR (metric tons)	4	178	126	82	40	75	36	44
TOTAL CO2 EMISSIONS/ YEAR (metric tons)	585							

Public Agency – Warren County

Available Warren County data included monthly fuel purchased by county department, as well as breakdown of fleet vehicles by fuel type. The county fuel purchases were not broken down by gasoline or diesel, therefore for emissions calculations it was assumed that the ratio of gasoline to diesel vehicles in each department fleet corresponded to the ratio of gallons of each fuel type. Table 4 below summarizes County data.

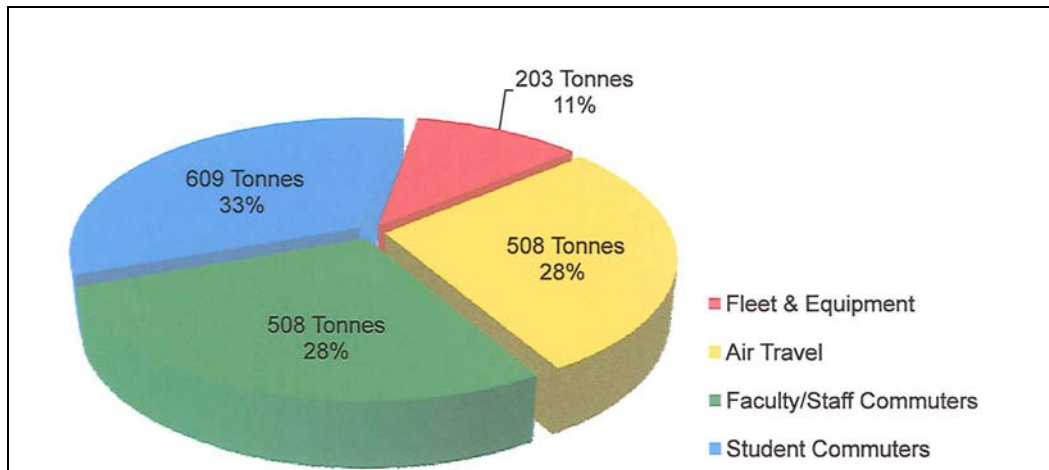
**Table 4
Warren County Transportation Energy Use and Emissions**

	Asses.	Conserv.	EMA	Maint.	Red Rock	Sheriff	Sec. Rds.	Zoning	Env. Health
Number of Gasoline Vehs	3	8	2	3	14	28	32	2	2
Number of Diesel Vehs	0	4	0	0	0	0	69	0	0
Gasoline (gal)	544	3,817	639	888	25,439	43,200	30,169	115	804
Diesel (gal)	0	1,909	0	0	0	0	65,051	0	0
TOTAL GALLONS	544	5,726	639	888	25,439	43,200	95,220	115	804
CO2 EMISSIONS/YEAR (metric tons)	5	56	6	8	236	400	969	1	7
TOTAL CO2 EMISSIONS/ YEAR (metric tons)	1,688								

Simpson College Transportation Sources

Data from a previous Simpson College study were provided, showing annual metric tons (referred to as “tonnes”) of CO2 emission related to Simpson College transportation. It is noted a portion of this data (e.g. some faculty and student commuting who live in Indianola) is likely redundant with some of the household data discussed above. These Simpson College sources total 1,828 metric tons of CO2, broken down by category in Chart 2 below.

**Chart 2
Simpson College Travel Emission Summary**



PART 2: TRANSPORTATION ENERGY USAGE AND CO2 EMISSIONS

The fuel consumption and CO2 emission data collected and summarized in Part 1 were utilized for the benefit/cost portion of this review. Benefit/cost (B/C) of various policy initiatives to reduce CO2 emissions are examined and summarized.

Approaches to Emission Reduction Strategies

The City of Indianola Sustainability Committee desires to reduce pollutant emissions caused by transportation sources in the City. There are two basic ways that this can be accomplished. First, through reducing pollutants per transportation source. This is primarily by the introduction of more efficient vehicles or vehicles that use alternative, lower pollution energy sources.

The second approach is by reducing the opportunities for transportation pollution (e.g. fewer trips, miles traveled). These strategies are part of the field of “Travel Demand Management”, an approach to transportation planning that deals with various policies or programs that work to reduce overall transportation usage and in particular peak hour congestion. The Federal Highway Administration³ provides a clearinghouse of Travel Demand Management strategies. Many of these strategies are particular to highly urbanized areas where higher density can support transit, toll lanes, etc. However, many strategies apply for a community such as Indianola, particularly with its high commuting base.

Strategies of both of these emission reduction approaches are discussed below. In addition, tables summarizing CO2 emissions of various strategy reductions can be found at the end of the report.

Benefits/Costs of Emission Reduction Strategies

Strategy 1 – Increase Commuting Rideshare

The City of Indianola has a large amount of residents who reside in Indianola and are employed in the Des Moines metropolitan area to the north. Survey results indicated most of these residents drive single-occupancy vehicles to accomplish these trips. Increased rideshare through car-pooling and van-pooling would reduce number of trips and therefore emissions.

The Des Moines Area Regional Transit Authority (DART) provides support for carpool and vanpool (up to 15 passenger in a van) services, including van inventory, ride-matching, and emergency rides home. According to DART, there is one van-pool currently organized from Indianola to Des Moines.

BENEFIT

- Given that 2008 data from the Census data indicates that of approximately 7,000 jobs of Indianola residents, approximately 2,600 (37%) were employed in Des Moines (2,000) or West Des Moines (600)
- Assume 500 of 2,500 Des Moines area commuters could frequently use a vanpool
 - Results in 450 fewer cars making trips
- Assume 45 mile round trip commute
- Assume each van pool transports 10 passengers
- Assume 252 working days per year

Therefore:

- 490 gal/year per commuting veh (45 miles*252 days)/(23 mpg avg)

³ United States Department of Transportation: Federal Highway Administration. “Travel Demand Management.” Accessible at: <<http://www.ops.fhwa.dot.gov/tdm/index.htm>>.

- 220,500 gallons/year no longer consumed (490 gal/year * 450 vehicles)
- Van pool vans consume 7,100 gal/year (10vans*45 mi*252days/yr)/16 mi/gal)
- Therefore 213,400 gallons/year reduced (220,500-7,100 gal/yr)
- Results in CO2 reduction of approximately **1,900 metric tons of CO2**

COST

Indianola Municipal Utilities (I.M.U.) or the City could support this in varying ways, with as little as publicizing the options to subsidizing the cost of vanpool. An incentive the City could offer would be to subsidize a quarter of the monthly cost of van-pool, with the resident and/or resident's employer covering remaining cost.

- For the conditions described, the monthly fare is \$83,
- Therefore assume a City subsidy of \$20 per rider (van driver's do not pay fare and therefore 450 passengers are assumed).
- This would result in a cost of **\$108,000** (450*\$20*12 months). See Table 5 for comparison with other strategies.

Strategy 2 – Decrease School, Extra-Curricular And Shopping Trips by Car

The household trips data showed that approximately 6,000 metric tons of CO2 (or 20%) of household emissions were generated from “daily” type trips to and from school, extra-curricular activities and shopping. There are many factors that go in to decisions for mode of transportation used for a trip, such as weather, safety, cargo, time, and many more. However, it is worth remembering that the City has a distinct “walk/bikeability” advantage in that from one corner to another in Indianola is a distance of 3 miles. Since most trips will not be all the way across town, it is reasonable to assume some trips could be accomplished by alternate means.

Therefore, this strategy would be for the City of Indianola to publicize and encourage citizen involvement in a “one out of twenty” trip campaign, to encourage citizens to pick one out of 20 of their trips of these types to be *not* driven in car, but instead walking or biking to, for example, the school or the store or to watch a sports game. This could be incorporated as part of the “Go Green Month” events in April and throughout the year as well.

BENEFIT

- Assume 5% reduction in emissions for these school, extra curricular and shopping trip type emissions
- Therefore **300 metric tons CO2 reduced** (0.10*6,000)

COST

There are many levels of complexity at which this could be done. With simple posters or notes in newsletters, to part of a wider campaign with “rewards” (competition, restaurant gift certificates, etc), to also being part of a pedestrian accommodation construction initiative to improve sidewalks/trails.

- Therefore, assume annual spending of \$5,000 on promotions and \$45,000 on high-profile, low costs improvements to walking/biking environment (signs, pavement markings, missing trail connections, etc) for total cost of **\$50,000**

Strategy 3 – Hybrid Police Vehicles

As can be seen in Table 3 and Table 4, City Police and County Sherriff vehicles log many miles in patrol and response driving, and therefore contribute a high percentage of Public Agency emissions in the community. For the City of Indianola, the Police Department is responsible for 22% of City emissions.

A large percentage of these miles are in stop-and-go traffic or low speed patrol of neighborhood areas. Numerous articles were found discussing City police departments replacing their police fleets with gasoline/electric hybrid vehicles. Notably, New York City⁴ replaced many of its Ford standard Crown Victoria and Chevrolet Impala police cruisers with hybrid Nissan Altimas, and other communities used smaller cars (e.g. Toyota Prius) or larger vehicles (e.g. Ford Escape).

BENEFIT

- Given in article that standard police cruisers achieve 16 miles per gallon, and hybrids 35 miles per gallon
- Assume 40% improvement in gasoline used and therefore emissions
- Given City police account for 13,564 gallons gas/year, resulting in 126 metric tons CO₂
- Assume 80% of police cars can be replaced. Fleet of 9 cars, therefore 7 cars.
- Therefore, 40% improvement in 80% of fleet results in 32% reduction in emissions ($0.4 \times 0.8 = 0.32$)
- Therefore **40 metric tons CO₂ reduced** ($0.32 \text{ reduction} \times 126 \text{ metric tons CO}_2/\text{year}$)

COST

- Assume upgrades to meet police specifications will be required of any police car, and therefore not factored in to compared price difference.
- Articles state hybrid costs \$1,500 more than standard vehicle, at approximately \$26,000/car.
- Assume 80% of police cars can be replaced. Fleet of 9 cars, therefore 7 cars.
- Therefore, cost per hybrid upgrade only: **\$10,500** ($7 \text{ cars} \times \$1,500/\text{car}$)
- Therefore entire cost for new vehicles **\$182,000** ($7 \text{ cars} \times \$26,000/\text{car}$)

Strategy 4 – Hybrid School Buses

Another public agency emission source area that accounts for a high percentage of emissions are school buses. These large vehicles drive many miles every day, and have very low gas mileage. As seen in Table 2, the school district's 49 vehicles (nearly all buses) account for 550 metric tons of CO₂ emission per year. The Center for Transportation Research and Education at Iowa State University is assisting in evaluating a national program of hybrid diesel/electric school buses⁵. A standard school bus achieves approximately 6.5 mpg, and the pilot study found improvements of up to 40%.

BENEFIT

- Given School District transportation results in approximately 550 metric tons CO₂ per year.

⁴ City of New York. "Mayor Bloomberg and police commissioner Kelly introduce hybrid cars to fleet of police response vehicles". Accessible at: < http://www.nyc.gov/html/nypd/html/pr/pr_2009_014.shtml>

⁵ Iowa State University. "Demonstrating the feasibility of hybrid electric school buses". Accessible at: <http://www.ctre.iastate.edu/pubs/en_route/06summer/hybrid_bus.htm>

- Article states improvements of up to 40% mpg efficiency, therefore assume conservative 30% improvement
- School district has 49 buses. Assume 25% of buses could be replaced.
- Therefore emission reduction benefit would be 30% reduction in 25% of fleet, therefore 7.5% of total (0.3×0.25)
- Therefore **42 metric tons CO2 reduced** per year (0.075×550 metric tons CO2).

COST

- Given each Hybrid School Bus costs \$140,000 more than conventional school bus (\$60,000 compared to \$200,000). Assume replacing buses when new bus needed.
- 25% of school bus fleet is 12 buses
- Therefore, costs is **\$1,680,000** (12 buses * \$140,000)

Strategy 5 – Hybrid City Vehicles

As noted above, of the 99 City vehicles listed in the inventory, the nine police vehicles account for approximately 22% of the emissions. Many of the other vehicles are not exchangeable for lower emission hybrid vehicles, such as large trucks used for Street and Parks departments. However, it is reasonable to assume City business mileage could be accommodated in fleet vehicles with the advantages of a gas/electric hybrid engine.

BENEFIT

- Assume 15% of 90 non-police City vehicles could be replaced with hybrid vehicles, therefore 13 vehicles replaced.
- Hybrids achieve up to 50% improvement in mpg vs. non-hybrid average. Assume 40% increase in fuel efficiency (e.g. 25 mpg to 35 mpg)
- Non-police emissions are 459 metric tons CO2/year
- Therefore emission reduction benefit would be 40% reduction of 15% of non-police emissions, therefore 6% emission reduction (0.4×0.15)
- Therefore **28 metric tons CO2 reduced** per year (0.06×459 metric tons CO2).

COST

- Assume \$26,000 cost for new hybrid vehicle.
- 15% of 90 non-police City vehicles is 13 vehicles
- Therefore, costs is **\$338,000** (13 vehs * \$26,000)

CONCLUSION: RANKINGS OF EMISSION REDUCTION STRATEGIES

Table 5 and Table 6 below summarize the various emission reduction strategies described above by cost, benefit (measured in metric tons of CO2 reduced) and cost per metric ton CO2 reduced. These results are also tabulated based on a five-year span (Table 6), which illustrates the impact of some costs being spread out over five years vs. other strategies requiring an annual cost. Both tables rank the strategies based on Cost per Ton of CO2 over the analysis time period.

This information can be used by the City and I.M.U. to guide decisions about effectiveness of various strategies to reduce transportation energy use and emissions. In addition, the existing transportation energy usage summarized in Part 1 and the methodology in Part 2 of this report can be used to evaluate and compare other strategies that may be suggested in the future.

Table 5
Benefit and Cost of Emission Reduction Strategies – One Year

Emission Reduction Strategy	Annual Cost (\$)	Annual CO2 Reduction (Metric Ton CO2)	Cost Per Annual Metric Ton CO2
1 - Increase Commuting Rideshare - Vanpool	\$108,000	1,900	\$57
2 - Decrease Car Usage for School/Extra Crr./Shop Trip	\$50,000	300	\$166
3a - Police Cars - Hybrid - Increased Veh. Cost Only	\$10,500	40	\$262
3b - Police Cars - Hybrid - Entire Car Cost	\$182,000	40	\$4,550
5 - City Vehicles - Hybrid	\$338,000	28	\$12,070
4 - School Bus - Hybrid Diesel/Electric	\$1,680,000	42	\$40,000

Table 6
Benefit and Cost of Emission Reduction Strategies – Five-Year Costs

Emission Reduction Strategy	5-year Cost (\$)	5-Year CO2 Reduction (Metric Ton CO2)	Cost Per Metric Ton CO2
1 - Increase Commuting Rideshare - Vanpool	\$540,000	9,500	\$57
3a - Police Cars - Hybrid - Increased Veh. Cost Only	\$10,500	1,500	\$53
2 - Decrease Car Usage for School/Extra Crr./Shop Trip	\$250,000	200	\$166
3b - Police Cars - Hybrid - Entire Car Cost	\$182,000	200	\$910
5 - City Vehicles - Hybrid	\$338,000	140	\$2,400
4 - School Bus - Hybrid Diesel/Electric	\$1,680,000	210	\$8,000

APPENDIX B: SUPPLEMENTAL TABLES

Appendix Table B-1
Calculation of Fuel Loss Factor - Natural Gas
City of Indianola

Fuel / Sector	Energy Used	Energy Usage
	(MMBtu)	at Source (MMBtu)
Natural Gas Consumption (1)		
Retail Sales	20,912,388	20,912,388
Total Consumption	22,810,168	22,810,168
Loss Factor	9.1%	9.1%

Notes:

- (1) Source: Energy Information Administration.
 Data for calendar year 2009, posted , 7/29/2010
http://tonto.eia.doe.gov/dnav/ng/ng_cons_sum_dcu_nus_a.htm

Appendix Table B-2
Refining Efficiency
City of Indianola

Fuel / Sector	Energy Consumption (MMBtu)	Refining Efficiency (%)	Energy Input (MMBtu)
Natural Gas Consumption (1)			
Gasoline	439,383	88.4%	497,040
Diesel	18,324	88.4%	20,729
Efficiency	457,708	88.4%	517,769

Notes:

- (1) Source: "Estimation of Energy Efficiencies of U.S. Petroleum Refineries."
 Michael Wang, Argonne National Laboratory, March 2008.
http://www.transportation.anl.gov/modeling_simulation/GREET/pdfs/energy_eff_petroleum_refineries-03-08.pdf

**Appendix Table B-3
 Projected Cooling Energy Usage
 Residential Class
 City of Indianola**

Fuel / Sector	Energy kWh
Electricity	
Base Energy Usage	3,115,942
Summer Consumption	4,223,302
Cooling Energy per month	1,107,359
Total Cooling Energy	5,536,797
Total Annual Energy	47,646,809
Cooling Percentage	12%

**Appendix Table B-4
 Projected Heating Energy Usage
 Residential Class - Electric
 City of Indianola**

Fuel / Sector	Energy kWh
Electricity	
Base Energy Usage	224,179
Winter Consumption	612,427
Heating Energy per month	388,249
Total Heating Energy	1,941,243
Total Annual Energy	47,646,809
Heating Percentage	4%

Appendix Table B-5
Survey Data Based on Age of Home

	Heating Fuel			WH Fuel	
	SEER	(% GAS)	Efficiency	(% GAS)	CFL %
2000-2009	12.22	98.21%	89.23	91.84%	67.24%
1990-1999	11.14	97.50%	88.50	100.00%	69.23%
1980-1989	10.60	84.62%	88.80	91.67%	73.33%
1970-1979	11.63	97.14%	87.00	91.18%	62.16%
1960-1969	10.85	97.73%	88.31	97.50%	71.74%
1950-1959	13.08	97.14%	90.44	97.14%	67.57%
1940-1949	13.00	100.00%	55.50	85.71%	66.67%
1930-1939	9.00	100.00%	90.67	100.00%	80.00%
1920-1929	12.00	100.00%	92.00	66.67%	33.33%
1910-1919	11.00	100.00%	76.50	90.91%	61.54%
1900-1909	12.50	100.00%	80.00	100.00%	100.00%
1890-1899	12.00	100.00%	90.00	75.00%	100.00%
1880-1889	N/A	100.00%	N/A	N/A	100.00%

Appendix Table B-6
Survey Data Based on Age of Home

Average Income	Customer Count	A/C SEER	Heating Fuel		WH Fuel		
			(% GAS)	Efficiency	(% GAS)	CFL %	With CFLs
<25k	37	12.50	100.00%	92.14	90.63%	54.05%	20
>25k<50k	61	10.83	96.43%	89.77	92.73%	63.93%	39
>50k<75k	47	12.21	100.00%	87.25	97.44%	68.09%	32
>75k<100k	44	11.50	90.48%	86.60	90.00%	75.00%	33
>100k	53	10.33	98.00%	87.39	95.45%	71.70%	38

Appendix Table B-7
Payback Period for CFL Conversion
Indianola Municipal Utilities

Products that earn the ENERGY STAR prevent greenhouse gas emissions by meeting strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy.
www.energystar.gov



**CHANGE FOR THE
BETTER WITH
ENERGY STAR**

Life Cycle Cost Estimate for 1 ENERGY STAR Qualified Compact Fluorescent Lamp(s)

This energy savings calculator was developed by the U.S. EPA and U.S. DOE and is provided for estimating purposes only. Actual energy savings may vary based on use and other factors.

Enter your own values in the gray boxes or use our default values.

Number of units	1		
Wholesale Electricity Rate (\$/kWh) (1)	\$ 0.050		
Hours used per day (2)	1.5		
	ENERGY STAR Qualified Unit	Conventional Unit	
Initial cost per unit (estimated retail price)	\$3.50	\$0.50	
Wattage (watts)	15*	60	▼
Lifetime (hours)	8,000	1,000	▼

*ENERGY STAR wattage is calculated based on the wattage selected for the incandescent unit, user can enter an alternative value if desired.

Annual and Life Cycle Costs and Savings for 1 CFLs

	1 ENERGY STAR Qualified Units	1 Conventional Units	Savings with ENERGY STAR
Annual Operating Costs*			
Energy cost	\$0	\$2	\$1
Maintenance cost	\$0	\$2	\$2
Total	\$0	\$4	\$3
Life Cycle Costs*			
Operating cost (energy and maintenance)	\$4	\$39	\$34
Energy costs (lifetime)	\$4	\$18	\$13
Maintenance costs (lifetime)	\$0	\$21	\$21
Purchase price for 1 unit(s)	\$3.50	\$0.50	-\$3.00
Total	\$8	\$39	\$31
		Simple payback of initial additional cost (years) [†]	1.0

* Annual costs exclude the initial purchase price. All costs, except initial cost, are discounted over the products' lifetime using a real discount rate of 4%. See "Assumptions" to change factors including the discount rate.

† A simple payback period of zero years means that the payback is immediate.

Summary of Benefits for 1 CFLs

Initial cost difference	\$3
Life cycle savings	\$34
Net life cycle savings (life cycle savings - additional cost)	\$31
Simple payback of additional cost (years)	1.0
Life cycle energy saved (kWh)	360
Life cycle air pollution reduction (lbs of CO ₂)	553

IMU Specific Notes:

1. Estimated average wholesale energy cost, including demand, energy and transmission service costs.
2. Based on average lighting usage per fixture from energy consumption survey.

**Appendix Table B-8
Commercial Audit Data
Improvements with Simple Payback less than 10 years**

Project	Sum of Implementation Cost	Sum of Therm Savings	Sum of Annual Savings	Average of Simple Payback	Sum of kWh Savings	Count # of Projects
4' Fluorescent Lighting	66,027		12,774	4.38	169,195	23
Compact Fluorescent Lighting	2,688		7,502	0.26	93,640	18
Door Heater Coolers	11,400		3,414	3.34	59,829	1
Exit Sign Retrofit	1,376		1,388	0.52	17,161	11
Fluorescent Lighting	1,592		536	2.35	7,150	1
Low Flow Kitchen Sprayers	75	29	19	3.95	5,040	1
Thermostat Setback	910	864	1,351	0.39	4,559	11
Occupancy Sensors	1,440		619	3.42	2,878	7
8' Fluorescent Lighting	1,879		323	5.08	2,616	3
Snack/Refrigerated Beverage Controller	340		184	1.85	2,453	1
Cooling System	1,713		210	7.65	1,786	2
Metal Halide Lighting	273		84	2.94	1,084	1
Heating System	4,750	556	457	8.88		3
Radiant Heat	5,500	1,319	958	5.74		1
Water Heater Insulation	69	50	53	0.94		6
Water Heaters	3,000	539	366	8.20		1
Weather-stripping	540	1,442	1,119	0.17		12
Grand Total	103,572	4,799	31,357	2.26	367,391	103
Total Energy - Audited Customers					9,467,734	
% Energy Savings					3.88%	

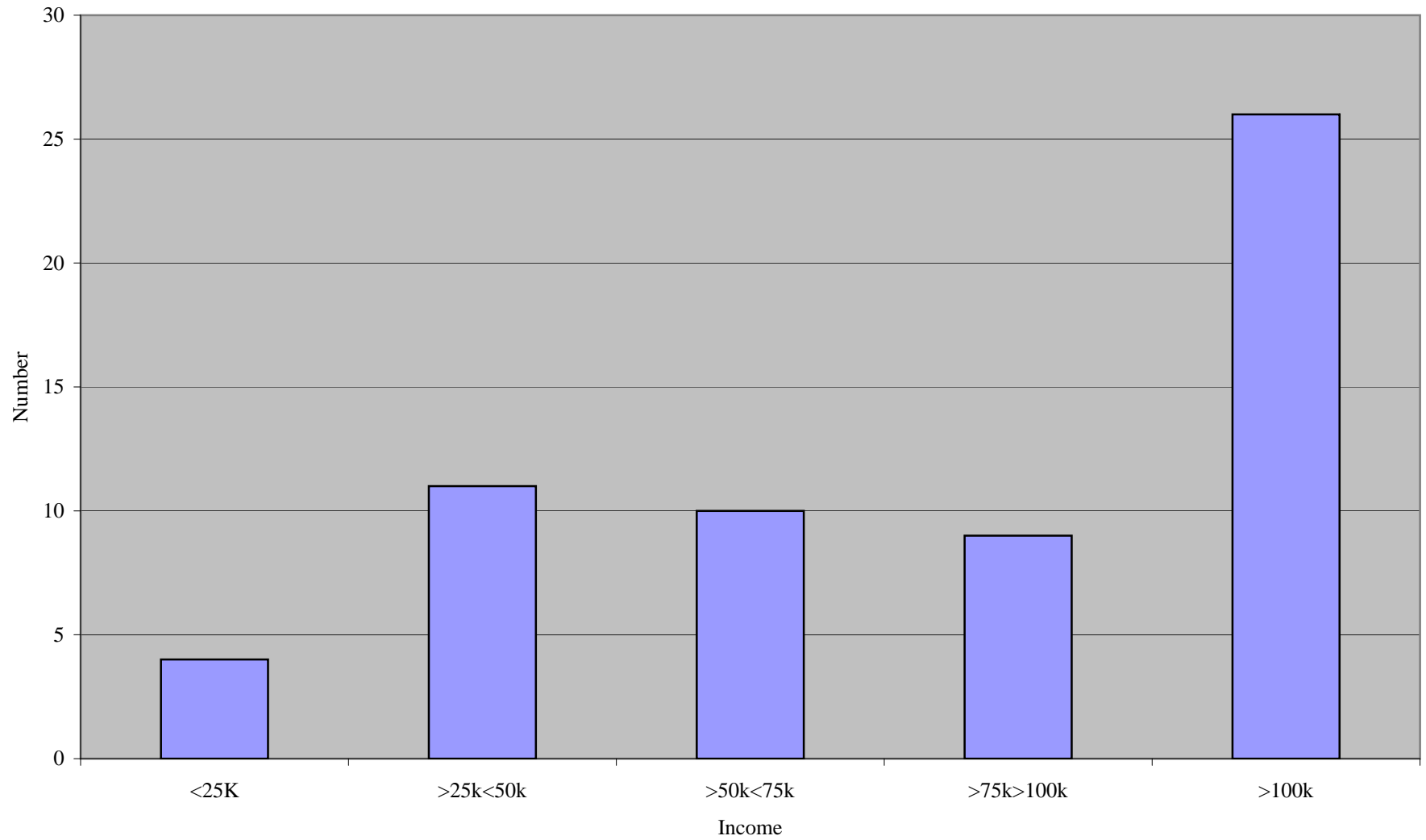
**Appendix Table B-9
Calculation of Margin of Error
Planned vs. Actual Sample Size**

	Responses	Total Population	Marg of Error 90% Confidence	Finite Population Correction	Adjusted MOE
Planned	400	5,141	4.90%	0.9604	4.71%
Actual	291	5,141	5.74%	0.9714	5.58%

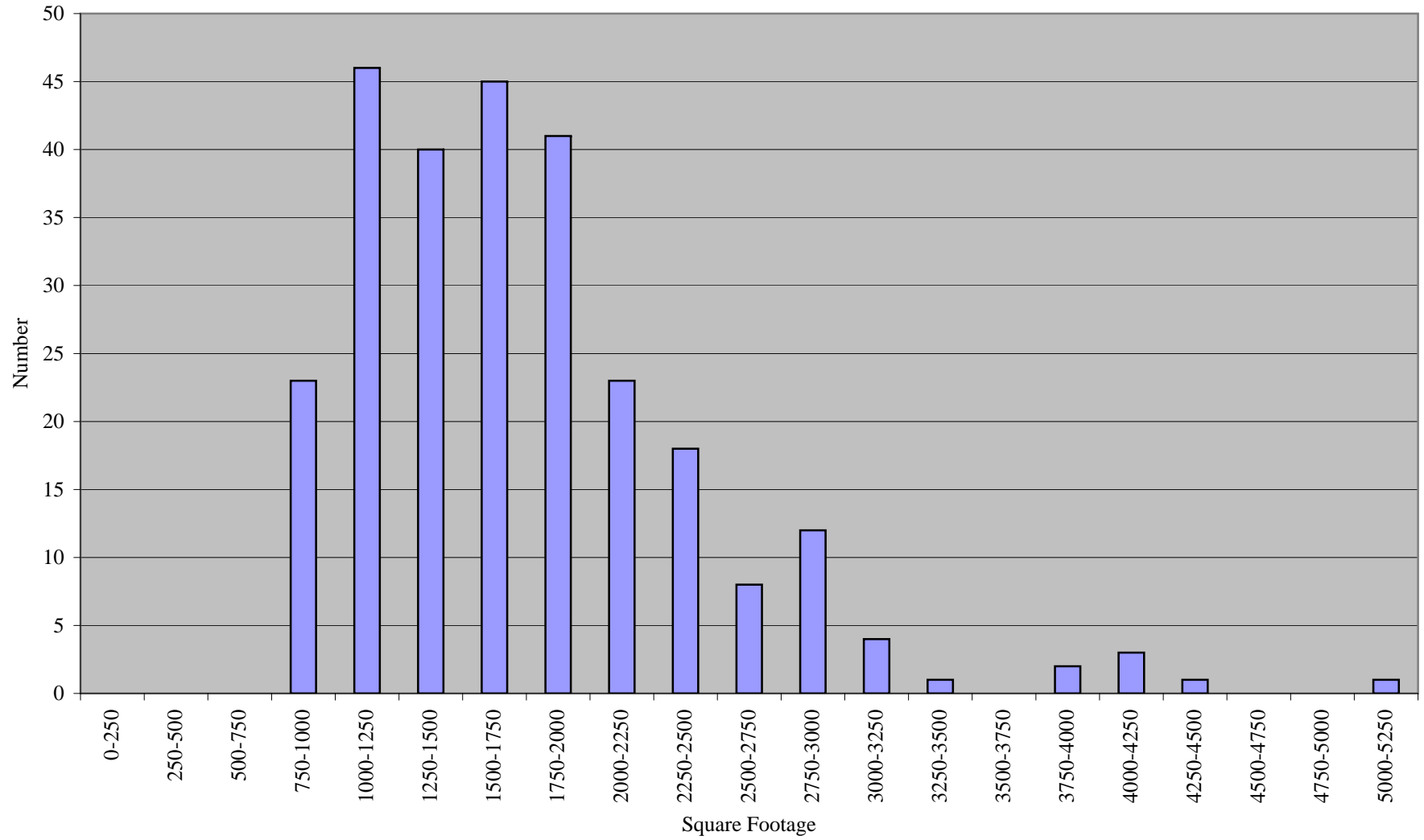
Test of Randomness of Sample

Total Per Month	3,916,089	
Variance	573,875,736,094	
Sample Total Per Month	3,809,359	
Z-Value	-0.49	Within Acceptable Range.

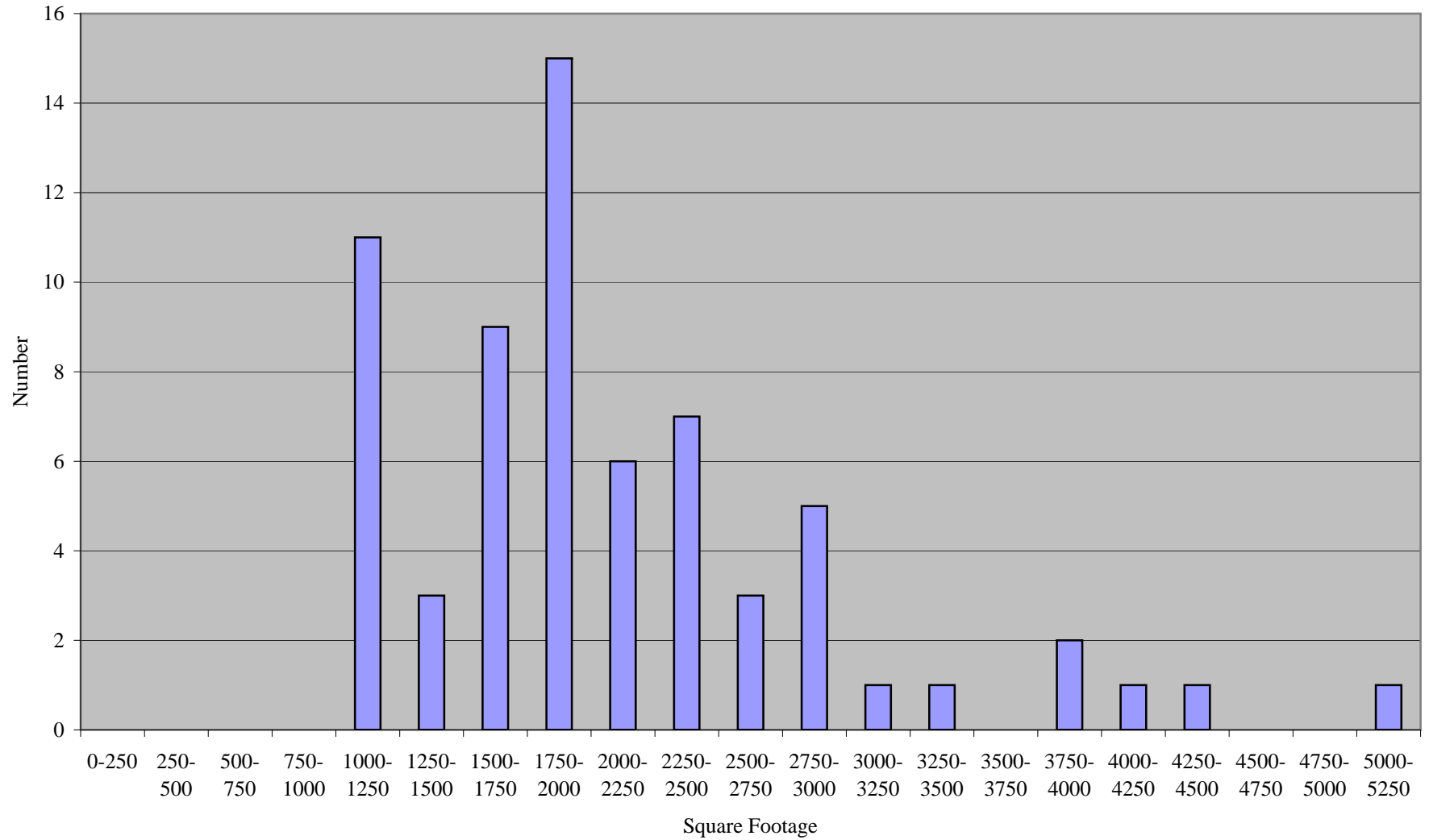
Appendix Figure B-1
Income Distribution for Top 25% of Energy Users



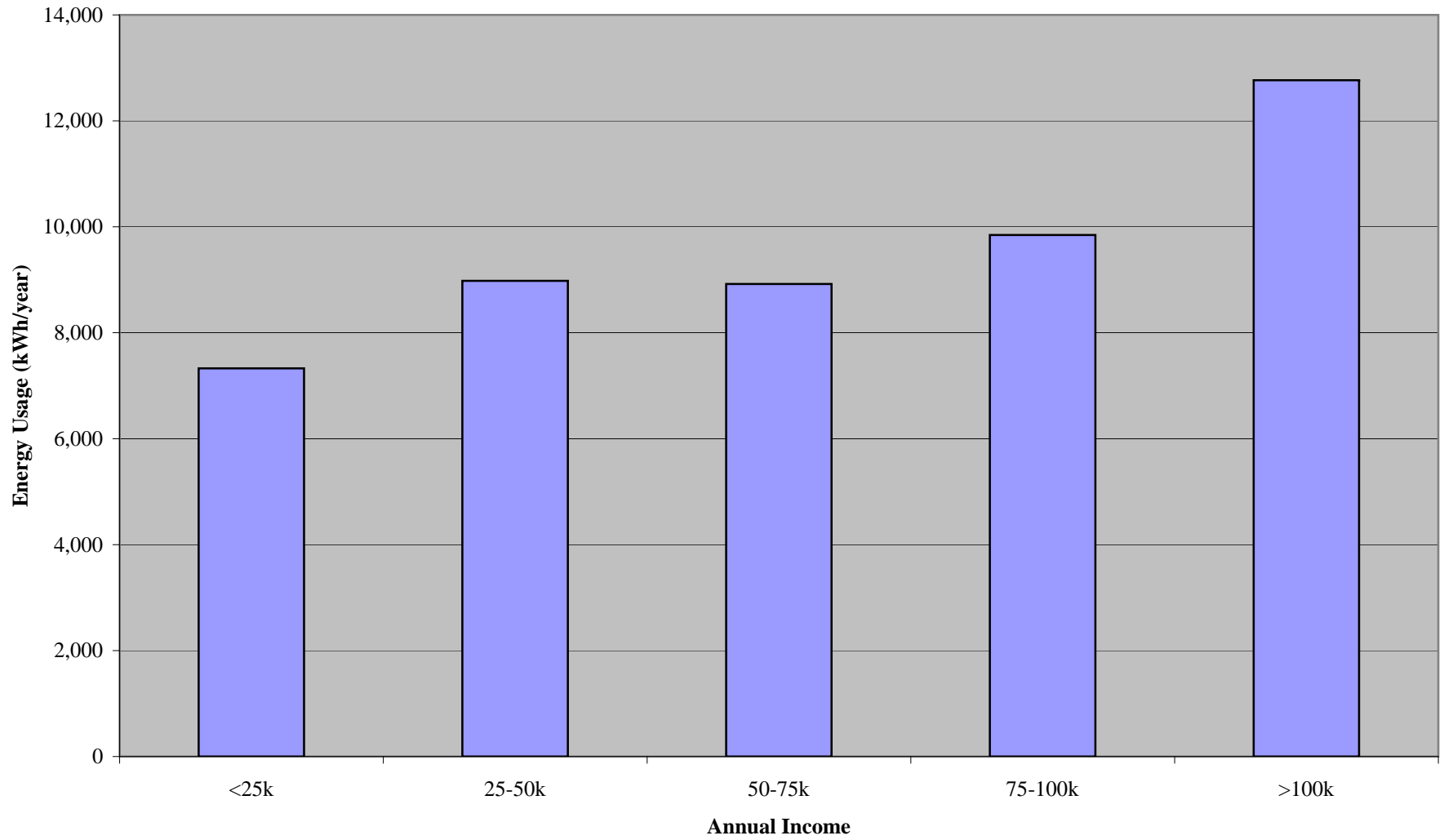
Appendix Figure B-2
Square Footage Distribution



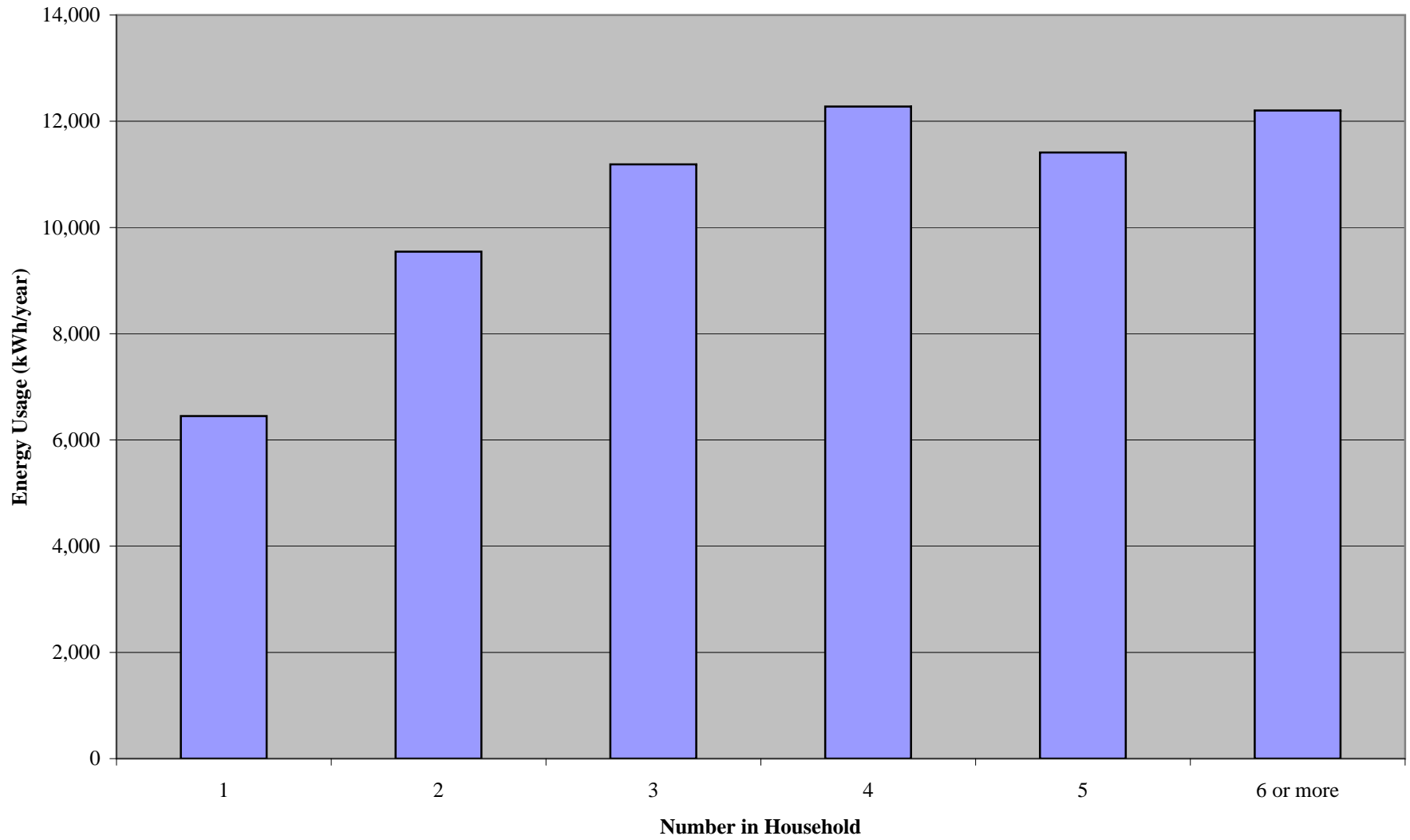
Appendix Figure B-3
Square Footage for top 25% of Energy Users



Appendix Figure B-4
Average Energy Usage by Income Level



Appendix Figure B-5
Energy Use by Household Size



APPENDIX C: RESIDENTIAL SURVEY

Indianola Municipal Utilities

Customer Energy Survey

Page 1 of 11

Enter Identifier Code Here: _____

House Information:

Year of Construction: _____

Style: _____ (Ranch, 2 story, etc)

Size: _____

Total sq. ft _____

Finished sq. ft _____

Estimated value (\$): _____

Cooling System:

Type of System: _____ (Central, window, heat pump)

Size: _____ (tons or Btu/hr)

SEER: _____

Year Installed: _____

Heating System:

Fuel: _____ (Natural gas / electric)

Type: _____ (Central, boiler, radiant, heat pump)

Size: _____ (Btu/hr)

Efficiency: _____

Year Installed: _____

Insulation:

Ceiling R rating: _____

Wall R rating: _____

Joist R rating: _____

Attic R rating: _____

Water Heating:

Fuel: _____ (Natural gas / electric)

Size: _____ (gallons)

Year Installed: _____

Efficiency: _____

Pipe insulation: _____ (yes / no)

Low flow fixtures: _____ (yes / no)

Lighting:

Number of Fixtures: _____

Dimmable: _____

Non-Dimmable: _____

Number of CFLs: _____

Other Appliances

If there is a blank next to the box, enter how many.

- | | | |
|--|---|---|
| Dishwasher <input type="checkbox"/> | Clothes Washer <input type="checkbox"/> | Electric Clothes Dryer <input type="checkbox"/> |
| Gas Clothes Dryer <input type="checkbox"/> | Tube television <input type="checkbox"/> ____ | Plasma TV <input type="checkbox"/> ____ |
| LCD TV <input type="checkbox"/> ____ | Desktop PC <input type="checkbox"/> ____ | Laptop PC <input type="checkbox"/> ____ |
| Cell phones <input type="checkbox"/> ____ | Electric Stove <input type="checkbox"/> ____ | Natural Gas Stove <input type="checkbox"/> ____ |
| Microwave <input type="checkbox"/> ____ | Chest Freezer <input type="checkbox"/> ____ | “Second” refrigerator <input type="checkbox"/> |

Demographics

People in Household

Adults _____
Children (under 19) _____ Ages _____

Occupation

Adult 1 _____
Adult 2 _____

Do any adults work from home? _____

Annual Household Income

- | | | |
|---------------------------------------|--------------------------------------|--------------------------------------|
| < \$25,000 <input type="checkbox"/> | \$25-50,000 <input type="checkbox"/> | \$50-75,000 <input type="checkbox"/> |
| \$75-100,000 <input type="checkbox"/> | > \$100,000 <input type="checkbox"/> | |

What do you believe IMU or the City of Indianola should investigate to reduce energy used by its residents, including transportation fuels, governmental use and customer use of electricity and natural gas?

Transportation Questions

1. Does your home have sidewalk or trail access to work, school, activities, personal trips, etc.?
-

2. Household Motorized Vehicle Inventory: Please provide the following information for each motorized vehicle in your household that is used for typical daily activities (up to four motorized vehicles per household)

a. **Vehicle 1:**

- i. What fuel type does this vehicle use?

- Gasoline
 Diesel
 Other (please specify) _____

- ii. What is the average or typical miles per gallon this vehicle (under your "normal" driving patterns)?
-

- iii. How would you classify this vehicle?

- Compact car (2-door)
 Car (4-door) (includes 4-door station wagon or hatchback)
 Light Pickup Truck
 Sport Utility Vehicle or Crossover Utility Vehicle
 Minivan
 Full Size Van
 Full Size Truck
 Motorcycle
 Scooter

- iv. Work Trips:

1. How many miles do you travel to your place of employment?
-

2. How do you typically make work trips?

- Car for every work trip (you are the only occupant of the vehicle)
 Car for every work trip (you rideshare or carpool with at least one other person)
 Car for some trips, walk/bike for other trips

3. Is it possible for you to use any of these alternate transportation modes for work trips?

- Walk
 Rideshare/carpool
 Bike
 No, reason: _____

- v. School Trips

1. How many miles do you travel from your home to school to drop off children for school? _____

2. How do you typically make these school trips?

- Car for every school trip (you are the only occupant of the vehicle other than the children)
- Car for every school trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

3. Is it possible for your children to use any of these alternate transportation modes for school trips?

- Walk
- Rideshare/carpool
- Bike
- School Bus
- No, reason: _____

vi. Extra-curricular activity trips (children's sports, non-school activities, regularly scheduled trips to fitness clubs, etc.)

1. How many trips per week do you make for extra-curricular activities?

2. How many miles per week do you travel for extra-curricular activities?

3. How do you typically make these school trips?

- Car for every trip (you are the only occupant of the vehicle other than the children)
- Car for every trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

4. Is it possible for your children to use any of these alternate transportation modes for these trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

vii. Errands/Personal Trips

1. How many trips do you typically make per week for errands or other personal trips that are not work or school related?

2. How many miles do you travel per week for errands or other personal trips that are not work or school related?

3. How do you typically make these trips?

- Car typically for all trips, and you typically make one trip at a time (home to destination to home)
- Car typically for all trips, and some trips are made one at a time (home to destination to home), and some trips are "chained" (such as: home to destination to destination to destination to home) to reduce travel distance and time.

Car typically for all trips, and you make an effort to “chain” trips as much as possible to reduce travel distance and time.

Car for some trips, walk/bike for other trips

4. Is it possible for you to use any of these alternate transportation modes for errands or other personal trips?

Walk

Rideshare/carpool

Bike

No, reason: _____

b. Vehicle 2:

i. What fuel type does this vehicle use?

Gasoline

Diesel

Other (please specify) _____

ii. What is the average or typical miles per gallon this vehicle (under your “normal” driving patterns)?

iii. How would you classify this vehicle?

Compact car (2-door)

Car (4-door) (includes 4-door station wagon or hatchback)

Light Pickup Truck

Sport Utility Vehicle or Crossover Utility Vehicle

Minivan

Full Size Van

Full Size Truck

Motorcycle

Scooter

iv. Work Trips:

1. How many miles do you travel to your place of employment?

2. How do you typically make work trips?

Car for every work trip (you are the only occupant of the vehicle)

Car for every work trip (you rideshare or carpool with at least one other person)

Car for some trips, walk/bike for other trips

3. Is it possible for you to use any of these alternate transportation modes for work trips?

Walk

Rideshare/carpool

Bike

No, reason: _____

v. School Trips

1. How many miles do you travel from your home to school to drop off children for school? _____

2. How do you typically make these school trips?

- Car for every school trip (you are the only occupant of the vehicle other than the children)
- Car for every school trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

3. Is it possible for your children to use any of these alternate transportation modes for school trips?

- Walk
- Rideshare/carpool
- Bike
- School Bus
- No, reason: _____

vi. Extra-curricular activity trips (children's sports, non-school activities, regularly scheduled trips to fitness clubs, etc.)

1. How many trips per week do you make for extra-curricular activities?

2. How many miles per week do you travel for extra-curricular activities?

3. How do you typically make these school trips?

- Car for every trip (you are the only occupant of the vehicle other than the children)
- Car for every trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

4. Is it possible for your children to use any of these alternate transportation modes for these trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

vii. Errands/Personal Trips

1. How many trips do you typically make per week for errands or other personal trips that are not work or school related?

2. How many miles do you travel per week for errands or other personal trips that are not work or school related?

3. How do you typically make these trips?

- Car typically for all trips, and you typically make one trip at a time (home to destination to home)
- Car typically for all trips, and some trips are made one at a time (home to destination to home), and some trips are "chained" (such as: home to destination to destination to destination to home) to reduce travel distance and time.

- Car typically for all trips, and you make an effort to “chain” trips as much as possible to reduce travel distance and time.
- Car for some trips, walk/bike for other trips

4. Is it possible for you to use any of these alternate transportation modes for errands or other personal trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

c. Vehicle 3:

i. What fuel type does this vehicle use?

- Gasoline
- Diesel
- Other (please specify) _____

ii. What is the average or typical miles per gallon this vehicle (under your “normal” driving patterns)?

iii. How would you classify this vehicle?

- Compact car (2-door)
- Car (4-door) (includes 4-door station wagon or hatchback)
- Light Pickup Truck
- Sport Utility Vehicle or Crossover Utility Vehicle
- Minivan
- Full Size Van
- Full Size Truck
- Motorcycle
- Scooter

iv. Work Trips:

1. How many miles do you travel to your place of employment?

2. How do you typically make work trips?

- Car for every work trip (you are the only occupant of the vehicle)
- Car for every work trip (you rideshare or carpool with at least one other person)
- Car for some trips, walk/bike for other trips

3. Is it possible for you to use any of these alternate transportation modes for work trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

v. School Trips

1. How many miles do you travel from your home to school to drop off children for school? _____

2. How do you typically make these school trips?

- Car for every school trip (you are the only occupant of the vehicle other than the children)
- Car for every school trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

3. Is it possible for your children to use any of these alternate transportation modes for school trips?

- Walk
- Rideshare/carpool
- Bike
- School Bus
- No, reason: _____

vi. Extra-curricular activity trips (children's sports, non-school activities, regularly scheduled trips to fitness clubs, etc.)

1. How many trips per week do you make for extra-curricular activities?

2. How many miles per week do you travel for extra-curricular activities?

3. How do you typically make these school trips?

- Car for every trip (you are the only occupant of the vehicle other than the children)
- Car for every trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

4. Is it possible for your children to use any of these alternate transportation modes for these trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

vii. Errands/Personal Trips

1. How many trips do you typically make per week for errands or other personal trips that are not work or school related?

2. How many miles do you travel per week for errands or other personal trips that are not work or school related?

3. How do you typically make these trips?

- Car typically for all trips, and you typically make one trip at a time (home to destination to home)
- Car typically for all trips, and some trips are made one at a time (home to destination to home), and some trips are "chained" (such as: home to destination to destination to destination to home) to reduce travel distance and time.

Car typically for all trips, and you make an effort to “chain” trips as much as possible to reduce travel distance and time.

Car for some trips, walk/bike for other trips

4. Is it possible for you to use any of these alternate transportation modes for errands or other personal trips?

Walk

Rideshare/carpool

Bike

No, reason: _____

d. Vehicle 4:

i. What fuel type does this vehicle use?

Gasoline

Diesel

Other (please specify) _____

ii. What is the average or typical miles per gallon this vehicle (under your “normal” driving patterns)?

iii. How would you classify this vehicle?

Compact car (2-door)

Car (4-door) (includes 4-door station wagon or hatchback)

Light Pickup Truck

Sport Utility Vehicle or Crossover Utility Vehicle

Minivan

Full Size Van

Full Size Truck

Motorcycle

Scooter

iv. Work Trips:

1. How many miles do you travel to your place of employment?

2. How do you typically make work trips?

Car for every work trip (you are the only occupant of the vehicle)

Car for every work trip (you rideshare or carpool with at least one other person)

Car for some trips, walk/bike for other trips

3. Is it possible for you to use any of these alternate transportation modes for work trips?

Walk

Rideshare/carpool

Bike

No, reason: _____

v. School Trips

1. How many miles do you travel from your home to school to drop off children for school? _____

2. How do you typically make these school trips?

- Car for every school trip (you are the only occupant of the vehicle other than the children)
- Car for every school trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

3. Is it possible for your children to use any of these alternate transportation modes for school trips?

- Walk
- Rideshare/carpool
- Bike
- School Bus
- No, reason: _____

vi. Extra-curricular activity trips (children's sports, non-school activities, regularly scheduled trips to fitness clubs, etc.)

1. How many trips per week do you make for extra-curricular activities?

2. How many miles per week do you travel for extra-curricular activities?

3. How do you typically make these school trips?

- Car for every trip (you are the only occupant of the vehicle other than the children)
- Car for every trip (you rideshare or carpool with at least one other person other than the children)
- Car for some trips, walk/bike for other trips

4. Is it possible for your children to use any of these alternate transportation modes for these trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

vii. Errands/Personal Trips

1. How many trips do you typically make per week for errands or other personal trips that are not work or school related?

2. How many miles do you travel per week for errands or other personal trips that are not work or school related?

3. How do you typically make these trips?

- Car typically for all trips, and you typically make one trip at a time (home to destination to home)
- Car typically for all trips, and some trips are made one at a time (home to destination to home), and some trips are "chained" (such as: home to destination to destination to destination to home) to reduce travel distance and time.

- Car typically for all trips, and you make an effort to “chain” trips as much as possible to reduce travel distance and time.
- Car for some trips, walk/bike for other trips

4. Is it possible for you to use any of these alternate transportation modes for errands or other personal trips?

- Walk
- Rideshare/carpool
- Bike
- No, reason: _____

APPENDIX D: RESIDENTIAL SURVEY RESPONSES

ID	House Information					Cooling						Heating Fuel	
	Year of Const.	Style	Finished sq. ft.	Total sq. ft.	Value	Brand	Size	SERIAL #	MODEL #	SEER	Year Installed		
						Type							
1	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	CENTRAL AIR	GE	36000	E071931829	N2A336AKA200	N/A	N/A	GAS
2	2007	1 STORY	3374	N/A	\$378,800	GEOTHERMAL	HYDRO HEAT	0	MTIV062B2045175	03-062-WTARW-T5-	N/A	N/A	GEOTH
3	2007	1 Story Townhouse	1036	N/A	\$73,300	CENTRAL AIR	LENNOX	30000	A07-00010046	CC30A3X-17SRX6762	N/A	N/A	GAS
4	2005	2 STORY	2522	N/A	\$265,620	CENTRAL AIR	WEATHER KING	48000	694ST490403468	12AJB42A01	N/A	N/A	GAS
5	2005	1 1/2 STORY	4003	N/A	\$354,100	CENTRAL AIR	Ruud	42000	6955F160413202	UAKB-060413202	N/A	N/A	GAS
6	2004	2 STORY	2096	N/A	\$226,200	CENTRAL AIR	AMANA STAR	0	N/A	N/A	N/A	N/A	N/A
7	2003	2 STORY	2457	N/A	\$269,000	CENTRAL AIR	N/A	36000	3171T3PSF	ZTTR1036A1000AA	N/A	N/A	GAS
8	2003	2 STORY	2486	N/A	\$276,700	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2003	GAS
9	2002	1 STORY	2088	N/A	\$207,100	CENTRAL AIR	HEIL	30000	22421717	224AKA4	N/A	N/A	GAS
10	2000	2 STORY	2978	N/A	\$282,000	CENTRAL AIR	HEIL	42000	CA9042VKD2	L992837332	N/A	N/A	GAS
11	2000	2 STORY	2398	N/A	\$292,000	CENTRAL AIR	Armstrong	42000	8499G27023	SCU10B42A-1A	N/A	N/A	GAS
12	1993	2 STORY	4172	N/A	\$346,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1998	GAS
13	1992	2 STORY	5100	N/A	\$581,960	CENTRAL AIR	Inter-City Products	42000	L930468196	AEA042G	N/A	N/A	GAS
14	1989	1 1/2 STORY	2800	N/A	\$240,000	CENTRAL AIR	Rheem	36000	N/A	RACC-092JAS	8	1988	GAS
15	1987	1 STORY	4439	N/A	\$368,400	CENTRAL AIR	Ruud	0	N/A	N/A	N/A	1995	GAS
16	1979	1 STORY	3862	N/A	\$262,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
17	1978	SPLIT FOYER	2106	N/A	\$155,000	CENTRAL AIR	Lennox	36000	N/A	12ACB3618	10	1995	GAS
18	1975	2 STORY	2987	N/A	\$301,800	CENTRAL AIR	LENNOX	42000	8499A33058	1DGC042-100IPH	N/A	N/A	GAS
19	1975	2 STORY	2987	N/A	\$301,800	CENTRAL AIR	Lennox	42000	8499A33058	1DGC042-100-1PH	N/A	N/A	GAS
20	1972	SPLIT FOYER	1150	N/A	\$157,500	CENTRAL AIR	Lennox	36000	5894643690	HS23-411-5P	N/A	N/A	GAS
21	1970	2 STORY	1816	2598	\$116,400	CENTRAL AIR	N/A	36000	N/A	N/A	12-Oct	2001/1998	GAS
22	1969	SPLIT	1354	N/A	\$139,300	CENTRAL AIR	LENNOX	24000	5899F36397	14526-024-2P	N/A	N/A	GAS
23	1967	2 STORY	2764	N/A	\$278,100	CENTRAL AIR	N/A	42000	2491E23237	38TKB042300	N/A	N/A	GAS
24	1965	2 STORY	1650	N/A	\$184,500	CENTRAL AIR	N/A	30000	N/A	N/A	N/A	N/A	GAS
25	1965	1 STORY	3153	N/A	\$231,600	CENTRAL AIR	LENNOX	54000	6001L39641	C2651651FC	N/A	N/A	GAS
26	1958	1 STORY	1667	N/A	\$123,000	CENTRAL AIR	HEIL	0	N/A	N/A	N/A	N/A	GAS
27	1918	1 1/2 STORY	1887	N/A	\$133,500	CENTRAL AIR	Ruud	0	N/A	N/A	N/A	N/A	GAS
28	1918	2 STORY	2166	N/A	\$162,700	CENTRAL AIR	Ruud	36000	7668N160804288	13AJL36A01	N/A	2009	GAS
29	1900	2 STORY	2382	N/A	\$166,400	CENTRAL AIR	RUUD	36000	7300M320705951	K55TLX LRH-0208	14	N/A	N/A
30	2002	2 STORY	2254	N/A	\$179,300	CENTRAL AIR	YORK	30000	1602C30830	SCU10B30A-3	N/A	N/A	GAS
31	2000	2 STORY	1532	N/A	\$169,400	CENTRAL AIR	N/A	30000	N/A	N/A	10	2000	GAS
32	1997	1 STORY	1331	N/A	\$167,900	CENTRAL AIR	N/A	30000	N/A	N/A	10	1996	GAS
33	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	CENTRAL AIR	Lennox	36000	5805J29571	HS26-036-6P	N/A	2005	GAS
34	2004	1 STORY	1602	N/A	\$211,900	CENTRAL AIR	AMANA	36000	404688536	RCC36C2A	N/A	N/A	GAS
35	2001	1 STORY	1636	N/A	\$134,800	CENTRAL AIR	PAYNE	24000	1900E10692	PA10AJA024-A	N/A	2000	GAS
36	2000	1 STORY	2859	N/A	\$269,600	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1997	GAS
37	1999	2 STORY	1914	N/A	\$210,400	CENTRAL AIR	ARMSTRONG	36000	8498F16228	SCU12A36A-3C	N/A	1989	GAS
38	1996	SPLIT FOYER	1200	N/A	\$137,400	CENTRAL AIR	Concept	30000	SCU10A30A	SCU1	N/A	N/A	GAS
39	1993	1 STORY	2434	N/A	\$224,300	CENTRAL AIR	AMERICAN	30000	G15274720	ATN030L100AO	N/A	1993	GAS
40	1989	2 STORY	1752	N/A	\$157,100	CENTRAL AIR	AMANA	42000	031275248A	CHA42TSC	N/A	N/A	GAS
41	1987	1 1/2 STORY	1836	N/A	\$196,900	CENTRAL AIR	Rheem	0	N/A	N/A	N/A	N/A	GAS
42	1973	SPLIT LEVEL	1778	N/A	\$182,800	CENTRAL AIR	Heil	48000	E062919545	H2A348GKA100	N/A	N/A	GAS
43	1969	1 STORY	2483	N/A	\$209,900	CENTRAL AIR	RHEEM	42000	4220F25888043	RAF042JBS	N/A	N/A	ELECTR
44	1969	SPLIT	1350	N/A	\$116,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
45	1968	1 STORY	2374	N/A	\$175,100	CENTRAL AIR	N/A	30000	1601E2108	SCUL0F30A-3	N/A	N/A	GAS
46	1964	1 STORY	960	N/A	\$138,000	CENTRAL AIR	Ruud	30000	7995W350909082	14AJM30A01	N/A	N/A	GAS
47	1963	1 1/2 STORY	1768	N/A	\$167,200	CENTRAL AIR	Carrier	36000	2096E20475	38TRAD30310	N/A	N/A	GAS
48	1961	1 STORY	1844	N/A	\$166,200	CENTRAL AIR	HEIL	42000	L982426090	CA5530VKD2	N/A	N/A	GAS
49	1960	1 STORY	1864	N/A	\$162,700	CENTRAL AIR	Lennox	30000	5800C28712	HS26-030-2P	N/A	N/A	GAS
50	1959	RANCH	826	N/A	Unlisted	CENTRAL AIR	N/A	24000	N/A	N/A	12	1999	GAS
51	1958	1 STORY	1117	N/A	\$99,900	CENTRAL AIR	RUUD	0	92-20842-15-00	N/A	N/A	1996	GAS
52	1953	1 Story Brick	3755	N/A	\$342,700	CENTRAL AIR	Goldman	36000	208/230	CKJ 18-10	N/A	N/A	Boiler
53	1930	1 1/2 STORY	1405	N/A	\$111,200	CENTRAL AIR	Carrier	36000	27488E05430	38EN036	N/A	N/A	GAS
54	1917	1 1/2 STORY	1630	N/A	\$121,500	CENTRAL AIR	Lennox	42000	5802H36426	HS26-042-3P	N/A	N/A	GAS
55	1915	2 STORY	2056	N/A	\$145,000	CENTRAL AIR	WINDOW	0	N/A	N/A	N/A	2010	GAS
56	1910	1 1/2 STORY	1326	N/A	\$84,600	CENTRAL AIR	RUUD	30000	N/A	VAND-030-JAZ	13	N/A	GAS
57	1900	2 STORY	2184	N/A	\$152,500	CENTRAL AIR	Lennox	36000	5887C15292	HS18-411-8P	N/A	N/A	GAS
58	Unlisted	APARTMENT	Unlisted	Unlisted	Unlisted	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	N/A
59	2007	1 STORY	1310	N/A	\$69,400	CENTRAL AIR	Rheem	24000	7402N230601071	13AJA24A01	N/A	N/A	GAS
60	2005	1 STORY	2779	N/A	\$170,900	CENTRAL AIR	GOODMAN	30000	507091974	CLJ30-1C	12	2005	GAS
61	2003	1 STORY	2477	N/A	\$220,200	CENTRAL AIR	HEIL	30000	E032457306	NAC230AKA5	N/A	2003	GAS
62	2003	1 STORY	2477	N/A	\$213,700	CENTRAL AIR	TRANE	24000	3062NTJ5K	2TRA1024A	N/A	N/A	GAS
63	2002	RANCH	2820	N/A	\$212,000	CENTRAL AIR	TRANE	24000	23128G33F	ZTTR2024A1000AA	12	2002	GAS
64	2000	1 STORY	1782	N/A	\$171,300	CENTRAL AIR	HEIL	24000	L992515571	CA5524VKD3	N/A	2000	GAS
65	1997	1 STORY	1632	N/A	\$151,400	CENTRAL AIR	N/A	24000	N/A	UAMH-024JHZ	12	1997	GAS
66	1993	2 STORY	2050	N/A	\$147,700	CENTRAL AIR	LENNOX	42,000	N/A	HS22-411U-3P	10	1993	GAS
67	1990	2 STORY	2008	2008	\$200,000	CENTRAL AIR	N/A	36000	N/A	N/A	14	2007	GAS
68	1975	1 1/2 STORY	1917	3934	\$282,200	CENTRAL AIR	N/A	36000	N/A	N/A	7-Oct	1996/1975	GAS
69	1975	SPLIT FOYER	1060	N/A	\$138,100	CENTRAL AIR	Armstrong	24000	6001E05679	EFC125AA-2A	N/A	N/A	GAS
70	1974	1 STORY	2264	N/A	\$162,200	CENTRAL AIR	HEIL	30,000	N/A	N/A	12	1998	GAS
71	1974	2 STORY	1762	N/A	\$186,500	CENTRAL AIR	Carrier	36000	2892E23775	38TMA036300	N/A	N/A	GAS
72	1968	SPLIT	2725	N/A	\$228,900	CENTRAL AIR	LENNOX	30000	5894006133	HS23-3111-5P	N/A	1994	GAS
73	1968	1 STORY	1588	N/A	\$133,800	CENTRAL AIR	RUUD ACHEEVER	0	N/A	N/A	N/A	2007	GAS
74	1968	1 STORY	1008	N/A	\$122,900	CENTRAL AIR	Central	75000	L021448232	EXA36F19C1	12	2003	GAS
75	1965	1 STORY	1536	N/A	\$118,200	CENTRAL AIR	N/A	30000	L944168786	CASS30VKAI	10.1	1994	GAS
76	1964	RANCH	988	988	\$114,400	CENTRAL AIR	N/A	24000	N/A	N/A	9	1995	GAS
77	1960	1 STORY	1168	N/A	\$139,200	CENTRAL AIR	Sears	0	3711101743	76981134	N/A	N/A	GAS
78	1960	1 STORY	1392	N/A	\$136,100	CENTRAL AIR	Ruud	36000	4082F37882515	UAFD-036 JAS	N/A	N/A	GAS
79	1959	1 STORY	1479	N/A	\$153,200	CENTRAL AIR	LENNOX	24000	5809A10293	XC14A-024-230R410A	N/A	N/A	GAS
80	1958	1 STORY	1817	N/A	\$153,100	CENTRAL AIR	TAPPAN	24000	FSA030705760	FS3BA-024KA	N/A	N/A	GAS
81	1958	1 STORY	1447	N/A	N/A	CENTRAL AIR	LENNOX	24000	5807L15072	XC13-024-230-07	13.5	2008	GAS
82	1958	1 STORY	2072	N/A	\$133,200	CENTRAL AIR	RHEEM	30,000	N/A	RAND-030JAZ	14	2008	GAS
83	1935	1 1/2 STORY	1935	N/A	\$130,700	CENTRAL AIR	Comfort Maker	0	N/A	N/A	N/A	N/A	GAS
84	1917	1 1/2 STORY	2160	N/A	\$158,500	CENTRAL AIR	GOODMAN	30000	801475716	GSC14030AE	N/A	2008	GAS
85	1907	2 story	1680	N/A	\$94,000	CENTRAL AIR	Ducane	30000	N/A	N/A	11	2000	GAS
86	1900	1 1/2 STORY	1788	N/A	\$138,900	CENTRAL AIR	LENNOX	0	N/A	N/A	N/A	N/A	GAS
87	1880	2 STORY	2788	N/A	\$192,500	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
88	Unlisted	APARTMENT	Unlisted	Unlisted	Unlisted	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	N/A
89	2007	1 Story Townhouse	1036	N/A	\$71,300	CENTRAL AIR	Lennox	36000	5807B39296	13ACD03023002	N/A	2007	GAS
90	2006	2 STORY	1310	N/A	\$150,000	CENTRAL AIR	RHEEM	24000	7402N230601007	13AJA24A01	N/A	N/A	GAS
91	2006	1 STORY	1662	N/A	\$168,400	CENTRAL AIR	WEATHER KING	24000	13A5A24A01	MPF/FAB	N/A	2007	GAS
92	2006	1 Story Condo	983	N/A	\$120,900	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
93	2005	1 STORY	985	N/A	\$88,760	CENTRAL AIR	Amana	24000	VCA24C2C	501667771	N/A	N/A	GAS
94	2004	RANCH	2540	N/A	\$206,900	CENTRAL AIR	TRANE	24000	4103X473F	ZTTR2024A1000AA	N/A	2004	GAS
95	2002	1 STORY	1857	N/A	\$185,900	CENTRAL AIR	INTERNATIONAL	36000	C021315896	HAC236AKA4	N/A	N/A	GAS
96	2001	1 STORY	1980	N/A	\$139,200	CENTRAL AIR	GOODMAN	30000	01 05503923	CKJ30-ID	N/A	N/A	GAS
97	1999	1 STORY	1212	N/A	\$124,800	CENTRAL AIR	Goodman	30000	9904565810	CK30-1A	N/A	N/A	GAS
98	1999	1 STORY	1278	N/A	\$148,100	CENTRAL AIR	Goodman	30000	9901475180	CKJ30-1A	N/A	N/A	GAS
99	1999	1 STORY	1636	N/A	\$195,700	CENTRAL AIR	Ruud	36000	7840W180901635	VANL-03ZJS	N/A	N/A	GAS

ID	House Information					Cooling						Heating Fuel	
	Year of Const.	Style	Finished sq. ft.	Total sq. ft.	Value	Brand	Size	SERIAL #	MODEL #	SEER	Year Installed		
						Type							
100	1997	1 STORY	3129	N/A	\$216,500	CENTRAL AIR	RUUD	36000	5073MOS-9610859	UAMA-036JAZ	N/A	N/A	GAS
101	1997	1 STORY	1512	N/A	\$201,700	CENTRAL AIR	American Standard	0	N/A	TXC049C4HPB1	N/A	N/A	GAS
102	1995	2 STORY	3000	3000	\$240,000	CENTRAL AIR	N/A	48000	N/A	N/A	12	2007	GAS
103	1993	2 STORY	2078	N/A	\$238,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1993	GAS
104	1990	1 STORY	1042	N/A	\$136,800	CENTRAL AIR	Ruud	24000	7293M240814016	VAND-024JAZ	N/A	N/A	GAS
105	1988	1 STORY	1576	N/A	\$195,000	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2007	GAS
106	1985	APARTMENT	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
107	1980	RANCH	1130	N/A	\$120,000	CENTRAL AIR	N/A	30000	N/A	N/A	8	1980	ELECTR
108	1978	1 STORY	1464	N/A	\$181,600	CENTRAL AIR	Lennox	36000	5807H05191	XC14-036-230-01	N/A	N/A	GAS
109	1975	RANCH	1404	2084	\$192,300	CENTRAL AIR	N/A	30000	N/A	N/A	10	2001	ELECTR
110	1975	1 STORY	2060	N/A	\$156,200	CENTRAL AIR	LENNOX ELITE	30000	5896J35076	CB30M-31-1P	N/A	N/A	GAS
111	1965	1 STORY	924	N/A	\$119,900	CENTRAL AIR	RHEEM	0	N/A	N/A	N/A	2007	GAS
112	1959	1 STORY	1175	N/A	\$107,300	CENTRAL AIR	CARRIER	24000	1698E06138	38TZA024300	N/A	N/A	GAS
113	1959	1 STORY	1625	N/A	\$124,700	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
114	1957	1 STORY	1010	N/A	\$134,800	CENTRAL AIR	Rheem	30000	7259M200606414	RAND030JAZ	N/A	N/A	GAS
115	1955	1 STORY	1280	N/A	\$145,700	CENTRAL AIR	International	24000	28064	RCO-20-1	N/A	N/A	GAS
116	1954	1 STORY	784	N/A	\$68,700	CENTRAL AIR	LENNOX	24000	5805G41106	HSXB15-024-230-02	N/A	N/A	GAS
117	1950	1 STORY	840	N/A	\$102,000	CENTRAL AIR	Lennox	0	2787957	N/A	N/A	N/A	GAS
118	1950	1 STORY	1070	N/A	\$92,200	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2008	GAS
119	1946	1 1/2 STORY	2050	N/A	\$108,900	CENTRAL AIR	LENNOX	0	N/A	N/A	N/A	N/A	GAS
120	1942	1 1/2 STORY	1442	N/A	\$114,000	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1998	GAS
121	1934	RANCH	1143	N/A	\$131,200	CENTRAL AIR	Ruud	24000	N/A	UAFDRA025JAS	9	1991	GAS
122	1930	1 STORY	1516	N/A	\$85,300	CENTRAL AIR	Ruud	30000	N/A	UAMB-030-JAZ	N/A	N/A	GAS
123	1918	1 STORY	1204	N/A	\$91,800	N/A	N/A	0	N/A	N/A	N/A	N/A	GAS
124	1910	2 STORY	2278	N/A	\$124,600	CENTRAL AIR	ARMSTRONG	42000	8498G11176	SCV108424-4A	N/A	2000	GAS
125	1900	2 STORY	2380	N/A	\$156,900	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2006	GAS
126	1890	1 STORY	1520	N/A	\$138,300	CENTRAL AIR	RUUD	36000	6090F159725167	UAMA-036JA2	N/A	N/A	GAS
127	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
128	Unlisted	APARTMENT	Unlisted	Unlisted	Unlisted	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
129	2003	1 STORY	952	N/A	\$91,600	CENTRAL AIR	RUUD	36000	T160200894	RCBA-24576614XI	N/A	N/A	GAS
130	2001	1 Story Townhouse	1331	N/A	\$168,400	CENTRAL AIR	Armstrong	30000	8401A17850	SCU10B 30A-1	N/A	N/A	GAS
131	2000	1 STORY	1331	N/A	\$147,300	CENTRAL AIR	Armstrong	0	8400D 19267	Concept 10	N/A	N/A	GAS
132	1998	1 STORY	1428	N/A	\$154,700	CENTRAL AIR	Armstrong	30000	8498C41732	SCU10A30A-3C	N/A	N/A	GAS
133	1996	APARTMENT	N/A	N/A	N/A	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
134	1992	APARTMENT	N/A	N/A	N/A	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
135	1990	1 STORY	3112	N/A	\$259,500	CENTRAL AIR	CARRIER	30000	2890E21971	38TK060300DL	N/A	N/A	GAS
136	1985	APARTMENT	N/A	N/A	N/A	N/A	GOODMAN	0	N/A	N/A	N/A	N/A	N/A
137	1979	SPLIT	1935	N/A	\$175,900	CENTRAL AIR	RUUD	36000	6263F180217600	UA,B-036JAZ	N/A	2000	GAS
138	1975	1 Story Frame	1668	N/A	\$131,200	CENTRAL AIR	Armstrong	36000	N/A	SCU10E36-1	N/A	N/A	GAS
139	1973	1 STORY	1852	N/A	\$150,700	CENTRAL AIR	AIRTEMP	0	N/A	N/A	N/A	N/A	GAS
140	1971	SPLIT	1444	N/A	\$124,300	CENTRAL AIR	N/A	0	5183EU109	N/A	N/A	N/A	GAS
141	1966	1 STORY	1104	N/A	\$117,800	CENTRAL AIR	RUUD	24000	5071F119607553	UAMA-024JA2	N/A	N/A	GAS
142	1964	1 STORY	923	N/A	\$148,300	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
143	1962	1 STORY	923	N/A	\$130,000	CENTRAL AIR	American Standard	0	ZD2LKL4C4F	N/A	N/A	N/A	GAS
144	1960	1 STORY	1333	N/A	\$97,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
145	1959	1 STORY	1693	N/A	\$123,800	CENTRAL AIR	Ruud	0	N/A	N/A	N/A	1990	GAS
146	1959	1 STORY	958	N/A	\$128,300	CENTRAL AIR	Heil	36000	L95205123	CA5536VKC1	N/A	N/A	GAS
147	1957	1 STORY	1300	N/A	\$99,900	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	N/A
148	1957	1 STORY	1176	N/A	\$143,100	CENTRAL AIR	Heil	30000	L961664072	CA9030VK01	N/A	N/A	GAS
149	1956	1 STORY	1425	N/A	\$145,000	CENTRAL AIR	LENNOX	30000	5803G40755	HSXB15-030-230-1	13+	2003	GAS
150	1956	1 STORY	1164	N/A	\$107,200	CENTRAL AIR	Ruud	0	N/A	N/A	N/A	N/A	GAS
151	1950	1 STORY	785	N/A	\$79,000	CENTRAL AIR	HED 9000	0	L930472094	CA9030472094	N/A	N/A	GAS
152	1942	1 STORY	1190	N/A	\$82,900	CENTRAL AIR	Sears	0	N/A	N/A	N/A	N/A	N/A
153	1923	1 1/2 STORY	1800	N/A	\$142,000	CENTRAL AIR	N/A	30000	N/A	N/A	12	2001	GAS
154	1920	1 STORY	1152	N/A	\$82,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
155	1910	1 STORY	786	N/A	\$54,200	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
156	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
157	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	CENTRAL AIR	Rheem	0	N/A	N/A	N/A	2004	GAS
158	N/A	N/A	N/A	N/A	N/A	CENTRAL AIR	RUUD ACHIEVER 10	0	N/A	N/A	N/A	N/A	GAS
159	N/A	N/A	N/A	N/A	N/A	CENTRAL AIR	HEIL	0	E051529366	HAC218AKC4	N/A	N/A	N/A
160	N/A	N/A	N/A	N/A	N/A	CENTRAL AIR	GOODMAN	0	311773475	V-18REVA	N/A	2005	N/A
161	N/A	N/A	N/A	N/A	N/A	N/A	Goodman	30000	10549757	CKJ30-1A	N/A	N/A	GAS
162	N/A	N/A	N/A	N/A	N/A	CENTRAL AIR	Lennox	30000	5805G29781	13ACD03023005	N/A	N/A	GAS
163	2009	1 STORY	1150	N/A	N/A	CENTRAL AIR	Goodman	0	N/A	N/A	14	2009	N/A
164	2005	1 STORY	2669	N/A	\$117,600	CENTRAL AIR	N/A	24000	6015K1R1F	ZTTX5024A1000AA	15	2006	GAS
165	2004	CONDO	1023	N/A	\$137,600	CENTRAL AIR	TEMPSTAR	24000	E042725547	NAC224AKC3	N/A	2004	GAS
166	2003	1 STORY	2079	N/A	\$164,500	CENTRAL AIR	ARMSTRONG	30000	8401A17853	SCU10B30A-1	N/A	2003	GAS
167	1995	2 STORY	2568	N/A	\$276,600	CENTRAL AIR	AMERICAN	36000	K353XESCF	7A0036A100A0	N/A	N/A	GAS
168	1991	1 Story Condo	1094	N/A	\$136,000	CENTRAL AIR	Star	24000	3294E06780	AA1BJ024-A	N/A	N/A	GAS
169	1976	RANCH	1472	1600	\$225,900	CENTRAL AIR	N/A	30000	N/A	N/A	13	2007	GAS
170	1970	1 STORY	964	N/A	\$111,200	CENTRAL AIR	RUUD	24000	6261F250011236	UAMB-024JAZ	N/A	2000	GAS
171	1969	1 STORY	1821	N/A	\$116,400	CENTRAL AIR	RUUD	0	N/A	N/A	N/A	N/A	GAS
172	1969	1 STORY	2152	N/A	\$169,300	CENTRAL AIR	AMANA	24000	310787080	RCE390C24	N/A	2003	GAS
173	1968	1 STORY	1620	N/A	\$158,600	CENTRAL AIR	LENNOX	24000	5801664946	12ACB24-OP	N/A	2002	GAS
174	1968	1 STORY	1719	N/A	\$122,900	CENTRAL AIR	ARMSTRONG	24000	8499L16301	SCU10B24A	N/A	N/A	GAS
175	1968	1 STORY	2033	N/A	\$157,700	CENTRAL AIR	SUPER HIGH	36000	L951538135	LA9036VKL1	N/A	1997	GAS
176	1966	1 STORY	1385	N/A	\$123,600	CENTRAL AIR	LENNOX	0	N/A	N/A	N/A	1975	GAS
177	1966	1 STORY	1868	N/A	\$150,300	CENTRAL AIR	AM. STANDARD	0	N/A	N/A	N/A	N/A	GAS
178	1965	1 STORY	1408	N/A	\$139,300	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	N/A
179	1962	1 STORY	1408	N/A	\$126,500	CENTRAL AIR	LENNOX	0	N/A	N/A	13ACC	2004	GAS
180	1962	1 STORY	1611	N/A	\$176,600	CENTRAL AIR	Lennox	30000	5189A00462	HS16-311V-7P	N/A	N/A	GAS
181	1961	1 STORY	1000	N/A	\$110,600	CENTRAL AIR	GE	0	N/A	N/A	N/A	1970	GAS
182	1960	1 STORY	1448	N/A	\$149,700	CENTRAL AIR	Tappan	0	N/A	N/A	N/A	N/A	GAS
183	1959	1 STORY	1008	N/A	\$81,100	WINDOW	GOLDSTAR	0	402KAXV0034	N/A	N/A	N/A	N/A
184	1959	1 STORY	1234	N/A	\$157,100	CENTRAL AIR	Rudd	30000	C3528F18858603	UACC030JAS	N/A	N/A	GAS
185	1958	1 STORY	1625	N/A	\$125,200	CENTRAL AIR	HEIL	30000	E092508873	H4A30GKD200	N/A	2009	GAS
186	1957	1 STORY	1107	N/A	\$124,100	CENTRAL AIR	Rheem	0	N/A	N/A	N/A	N/A	GAS
187	1957	1 STORY	1357	N/A	\$135,300	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1999	GAS
188	1956	1 STORY	1056	N/A	\$93,700	CENTRAL AIR	TAPPAN	12000	N/A	UM 30-6	N/A	2006	GAS
189	1956	1 STORY	2781	N/A	\$201,500	CENTRAL AIR	LENNOX	36000	51881302805	HS16-4114-4P	N/A	N/A	GAS
190	1956	1 STORY	1649	N/A	\$138,900	CENTRAL AIR	LENOX	30000	5803E63630	13ACC-030-230-01	N/A	2003	GAS
191	1942	1 STORY	1915	N/A	\$135,200	CENTRAL AIR	LENNOX	24000	5895H-13785	HS25-261-1P	N/A	N/A	GAS
192	1938	2 STORY	2232	N/A	\$141,600	CENTRAL AIR	N/A	36000	6768MO40406145	124HJH3001	N/A	2003	GAS
193	1914	1 STORY	1588	N/A	\$120,600	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
194	1890	1 1/2 STORY	1885	N/A	\$149,100	CENTRAL AIR	Goodman	36000	9502042624	CK36-1B	N/A	N/A	GAS
195	Unlisted	Unlisted	Unlisted	N/A	Unlisted	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1970	GAS
196	2007	1 STORY	1214	N/A	\$98,300	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2007	GAS
197	1983	SPLIT FOYER	996	N/A	\$128,700	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1983	ELECTR
198	1974	1 STORY	1920	N/A	\$207,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1962	GAS

ID	House Information					Cooling						Heating Fuel	
	Year of Const.	Style	Finished sq. ft.	Total sq. ft.	Value	Type	Brand	Size	SERIAL #	MODEL #	SEER		Year Installed
199	1967	RANCH	1539	N/A	\$180,900	CENTRAL AIR	N/A	30000	N/A	N/A	10	1996	GAS
200	1910	2 STORY	1022	N/A	\$98,500	WINDOW	N/A	6000	N/A	N/A	9	2008	GAS
201	2005	Ranch	1562	N/A	\$161,400	CENTRAL AIR	N/A	24,000	N/A	N/A	12	2005	GAS
202	2003	1 STORY	1680	N/A	\$220,500	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2003	GAS
203	1996	CONDO	1234	N/A	\$162,000	CENTRAL AIR	Carrier	24000	2194E12424	AA1B5024-B	N/A	N/A	GAS
204	1972	1 STORY	1500	N/A	\$132,500	CENTRAL AIR	N/A	24000	N/A	N/A	12	2003	GAS
205	1970	1 STORY	936	N/A	\$122,500	CENTRAL AIR	York	36000	(S)EGTS176347	61UA036S17C	N/A	N/A	GAS
206	2000	2 STORY	1392	N/A	\$202,200	CENTRAL AIR	N/A	30000	N/A	N/A	10	2000	GAS
207	1986	MOBILE HOME	1248	N/A	\$35,500	CENTRAL AIR	N/A	24000	N/A	N/A	8	1987	GAS
208	1979	1 STORY	1340	N/A	\$181,900	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
209	1972	1 STORY	960	N/A	\$140,800	CENTRAL AIR	N/A	30000	N/A	N/A	10	1992	GAS
210	1966	RANCH	1899	N/A	\$219,400	CENTRAL AIR	Heil	42000	N/A	CA9042UKCI	12	1966	GAS
211	1965	1 STORY	1512	N/A	\$138,700	CENTRAL AIR	N/A	30000	N/A	N/A	12	2001	GAS
212	1958	1 STORY	1000	N/A	\$138,200	CENTRAL AIR	Rudd	24000	6261F129912887	UAMB-024JAZ	N/A	N/A	GAS
213	1956	1 STORY	1144	N/A	\$131,900	CENTRAL AIR	N/A	24000	N/A	N/A	10	1992	GAS
214	1925	1 1/2 STORY	1715	N/A	\$132,400	WINDOW	N/A	0	N/A	N/A	N/A	2003	GAS
215	1987	RANCH	1488	N/A	\$161,500	CENTRAL AIR	N/A	36000	N/A	N/A	13	2006	GAS
216	1963	1 STORY	1092	N/A	\$123,600	CENTRAL AIR	N/A	24000	N/A	N/A	N/A	2009	GAS
217	1960	MOBILE HOME	768	N/A	\$70,000	CENTRAL AIR	Coleman	30000	1.00E+09	SSX140301BA	N/A	N/A	GAS
218	1955	1 STORY	1068	N/A	\$90,100	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
219	1995	1 STORY	1976	N/A	\$237,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
220	1967	2 STORY	1440	N/A	\$147,600	CENTRAL AIR	Lennox	0	N/A	N/A	N/A	N/A	GAS
221	2001	2 STORY	1743	N/A	\$193,400	CENTRAL AIR	Ruud	36000	5429F120107589	UAKA-037JAZ	N/A	N/A	GAS
222	1975	1 STORY	1545	N/A	\$150,500	CENTRAL AIR	RUUD	24000	7293M160606576	UAND-024JAZ	N/A	2006	GAS
223	Unlisted	Unlisted	Unlisted	N/A	Unlisted	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2008	GAS
224	2006	2 STORY	1592	N/A	\$187,700	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2006	GAS
225	1995	1 STORY	1445	N/A	\$190,000	CENTRAL AIR	Ruud	0	N/A	N/A	N/A	N/A	GAS
226	1995	2 STORY	1775	N/A	\$162,600	CENTRAL AIR	Lennox	30000	5895D08050	12ACB30-1P	N/A	N/A	GAS
227	1992	SPLIT	1266	N/A	\$137,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1991	GAS
228	2008	RANCH	2456	N/A	\$184,000	CENTRAL AIR	N/A	30000	N/A	N/A	13	2009	GAS
229	2007	1 STORY	1636	N/A	\$146,600	CENTRAL AIR	LENNOX	30000	5807M17626	13ACD-030-230-03	N/A	N/A	GAS
230	1980	SPLIT LEVEL	1510	N/A	\$107,300	CENTRAL AIR	DAYTON	0	L893145429	3C648	N/A	N/A	GAS
231	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	N/A	GOODMAN	30000	703545492	G8C130181AD	N/A	N/A	N/A
232	Unlisted	MOBILE HOME	Unlisted	Unlisted	Unlisted	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
233	1991	SPLIT LEVEL	1880	N/A	\$166,200	CENTRAL AIR	LENNOX	36000	5791G09130	HS18-411-SP	N/A	N/A	GAS
234	1989	1 STORY	768	N/A	\$147,100	CENTRAL AIR	RUUD HIGH	0	N/A	N/A	N/A	N/A	GAS
235	1965	1 STORY	1344	N/A	\$128,900	CENTRAL AIR	Rheem	30000	6951-M1904-05319	RAKB-030JAZ	N/A	N/A	GAS
236	1960	1 STORY	1225	N/A	\$131,200	CENTRAL AIR	Ruud	0	N/A	N/A	N/A	N/A	GAS
237	1958	1 STORY	1710	N/A	\$115,200	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2009	GAS
238	1890	2 STORY	1530	1530	\$158,400	CENTRAL AIR	N/A	30000	N/A	N/A	12	1997	GAS
239	1990	2 STORY	2821	N/A	\$261,000	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2007	GAS
240	1976	1 STORY	1524	N/A	\$221,900	CENTRAL AIR	Ruud	36000	N/A	UACC-030-JAS	N/A	1989	GAS
241	1917	2 STORY	1664	N/A	\$162,300	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
242	1947	1 1/2 STORY	1858	N/A	\$151,500	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1996	GAS
243	1972	1 STORY	864	N/A	\$118,100	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
244	1945	1 STORY	1180	N/A	\$75,600	CENTRAL AIR	N/A	0	N/A	N/A	13	2008	GAS
245	2009	1 1/2 STORY	4028	N/A	UNKNOWN	CENTRAL AIR	BRYANT	42000	0909X35786	CNPVP4221ATAABA	N/A	N/A	GAS
246	2007	1 STORY	1669	N/A	\$235,100	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2007	GAS
247	2001	2 STORY	1725	N/A	\$193,000	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2001	GAS
248	2000	2 STORY	2231	N/A	\$189,700	CENTRAL AIR	N/A	30000	8400B32183	SCU10B30A-1A	N/A	N/A	GAS
249	1999	2 STORY	2583	N/A	\$242,300	CENTRAL AIR	Honeywell	36000	56099H35445	CAU30-3	N/A	N/A	GAS
250	1999	Tri-level	2400	N/A	\$199,000	CENTRAL AIR	TEMPSTAR	36000	N/A	N/A	10	1999	GAS
251	1995	2 STORY	2171	N/A	\$234,500	CENTRAL AIR	NORDYNE	36000	FSD070201473	FS4BD-030KA	N/A	2008	GAS
252	1994	2 STORY	1966	N/A	\$224,100	CENTRAL AIR	Lennox	30000	5894J51253	H519-311-6P	N/A	N/A	GAS
253	1973	2 STORY	2422	N/A	\$197,100	CENTRAL AIR	INTERNATIONAL	48000	E041140423	HAL248AKC4	N/A	2006	GAS
254	1966	SPLIT	1858	N/A	\$146,600	CENTRAL AIR	LENNOX	36000	S172D07176	HSS-4113FFA	N/A	N/A	GAS
255	1900	2 STORY	2557	N/A	\$158,000	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2000	GAS
256	1973	1 STORY	1906	N/A	\$210,500	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2001	GAS
257	1999	2 STORY	1110	N/A	\$115,200	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2000	ELECTR
258	1989	1 STORY	1117	N/A	\$110,000	CENTRAL AIR	N/A	42000	2885133241	C42074VKB1	N/A	N/A	GAS
259	1964	1 STORY	1150	N/A	\$140,400	CENTRAL AIR	Ruud	30000	7386M210807982	UAN1030IAZ	N/A	N/A	GAS
260	1960	RANCH	826	N/A	\$138,700	CENTRAL AIR	N/A	30000	N/A	N/A	N/A	N/A	N/A
261	Unlisted	Unlisted	Unlisted	N/A	Unlisted	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2007	GAS
262	1976	1 STORY	2000	N/A	\$160,000	CENTRAL AIR	N/A	30,000	N/A	N/A	13	2005	GAS
263	1970	1 STORY	1996	N/A	\$148,900	CENTRAL AIR	LENNOX	30000	5897H22961	G26Q3-75-3	N/A	N/A	GAS
264	2006	2 STORY	1552	N/A	\$90,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2006	GAS
265	2003	1 STORY	1403	N/A	\$182,100	CENTRAL AIR	RHEEM	0	RHN61102147299	41VR40	N/A	2003	GAS
266	1974	SPLIT FOYER	1012	N/A	\$133,000	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
267	1950	1 STORY	1552	N/A	\$125,400	CENTRAL AIR	N/A	30000	N/A	N/A	17	2008	GAS
268	2006	2 STORY	1405	N/A	\$156,900	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2007	GAS
269	2004	2 STORY	1780	N/A	\$210,800	CENTRAL AIR	N/A	36000	E092047428	NAC036AKC3	N/A	N/A	GAS
270	1997	1 STORY	2112	N/A	\$157,700	CENTRAL AIR	SUPER HIGH	24000	L975148605	CA903OUKD2	N/A	N/A	GAS
271	2004	1 1/2 STORY	2456	N/A	\$210,800	CENTRAL AIR	N/A	30000	N/A	N/A	12	2004	GAS
272	1972	RANCH	1256	N/A	\$165,500	CENTRAL AIR	N/A	30000	N/A	N/A	13	2006	GAS
273	1910	2 STORY	2868	N/A	\$120,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2006	GAS
274	1975	SPLIT	1808	N/A	\$112,300	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2008	GAS
275	2005	2 STORY	2155	N/A	\$182,700	CENTRAL AIR	AMANA	36000	407733427	RCC36C2H	N/A	2004	GAS
276	2004	1 STORY	2357	N/A	\$389,800	CENTRAL AIR	TRANE	0	N/A	XR12	N/A	N/A	GAS
277	1991	SPLIT FOYER	1846	N/A	\$195,800	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
278	2006	2 STORY	1805	N/A	\$168,700	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2006	GAS
279	2007	1 STORY	938	N/A	\$119,300	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
280	1991	2 STORY	1316	N/A	\$155,700	CENTRAL AIR	Lennox	30000	5191K07643	HS20-311-2P	N/A	1991	GAS
281	1995	1 STORY	2737	N/A	\$230,200	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1994	GAS
282	1890	1 STORY	1120	N/A	\$104,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	2008	GAS
283	1956	1 STORY	1440	N/A	\$124,100	CENTRAL AIR	N/A	36000	N/A	N/A	12	2000	GAS
284	Unlisted	Unlisted	Unlisted	Unlisted	Unlisted	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A
285	1973	1 STORY	1019	N/A	\$130,200	CENTRAL AIR	Lennox	0	N/A	N/A	N/A	N/A	N/A
286	1988	1 STORY	1920	N/A	\$140,900	CENTRAL AIR	LENNOX	24,000	N/A	HSXA16-024-230-01	16	2007	GAS
287	1958	1 STORY	1850	N/A	\$129,100	CENTRAL AIR	GOODMAN	24000	9703127431	CK124-18	N/A	N/A	GAS
288	1973	SPLIT FOYER	1090	N/A	\$125,200	CENTRAL AIR	N/A	0	N/A	N/A	N/A	1988	GAS
289	2000	1 STORY	1830	N/A	\$228,400	CENTRAL AIR	N/A	0	N/A	N/A	N/A	N/A	GAS
290	1999	2 STORY	1680	N/A	\$155,000	CENTRAL AIR	Lennox	30000	Prior To Recieving	C23-31-1	10	1999	GAS
291	1947	1 1/2 STORY	2119	N/A	\$159,320	CENTRAL AIR	GOODMAN	Prior To	Prior To Recieving	Prior To Recieving	Prior To	2006	GAS

ID	Type	SERIAL #	MODEL #	Size (btu/hr)	Efficiency	Year Installed	Insulation				Wall thickness	Wat Heat Fuel
							Ceiling	Joist	Wall	Attic		
100	N/A	N/A	N/A	0	N/A	1997	N/A	N/A	N/A	N/A	2X6	N/A
101	American Standard	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
102	N/A	N/A	N/A	100000	90	1994	R24	N/A	R19	R24	2X6	GAS
103	CENTRAL	N/A	N/A	0	N/A	1993	N/A	N/A	N/A	N/A	N/A	GAS
104	Ruud	RFCA-HM2417AC	M340816637	24000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
105	CENTRAL	N/A	N/A	0	N/A	2007	N/A	N/A	N/A	N/A	N/A	GAS
106	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
107	N/A	N/A	N/A	0	100	1980	N/A	N/A	R11	R19	2x4	ELECTRIC
108	Lennox	597607903	G43UF-48C-090-08	48000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
109	HEAT PUMP	N/A	N/A	0	100	2001	N/A	N/A	R13	N/A	2X4	ELECTRIC
110	RICHMOND	5896J35076	CB30M-31-1P	30000	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
111	RHEEM	N/A	N/A	0	N/A	2007	N/A	N/A	N/A	N/A	N/A	GAS
112	CARRIER	3298X23413	CD5AXU030017AAAA	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
113	CENTRAL	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
114	Lennox	5883M153226	C16-41W-00-1	42000	N/A	N/A	N/A	N/A	N/A	N/A	2x6	GAS
115	TempStar	L984383644	NTC6075FBA1	36000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
116	LENNOX	6005H67924	CX34-30B6F	30000	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
117	Lennox	5899-20470	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
118	HEAT PUMP	N/A	N/A	0	N/A	2008	N/A	N/A	N/A	N/A	N/A	GAS
119	ENERGY STAR	N/A	GMH95	0	N/A	2006	N/A	N/A	N/A	N/A	N/A	GAS
120	CENTRAL	N/A	N/A	0	N/A	2003	N/A	N/A	N/A	N/A	N/A	GAS
121	Ruud	N/A	UDRA-06EMAES	60000	92	2007	N/A	R19	R13	R38	2x4	GAS
122	Ruud	N/A	UAMB-030-JAZ	30000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
123	RUUD	CN3D10GF15878613	UGDA-100A-AF	36000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
124	GOODMAN	N/A	GMH950703BXAC	54000	N/A	2005	N/A	N/A	N/A	N/A	N/A	GAS
125	CENTRAL	N/A	N/A	0	N/A	2006	N/A	N/A	N/A	N/A	N/A	GAS
126	RUUD	EV5D302F379702290	UGPH-10FAMER	42000	N/A	N/A	N/A	N/A	N/A	N/A	2X4/2X6	GAS
127	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
128	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
129	RUUD SILOUETTE II	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
130	Ultra V	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
131	Wycoff	5V4562H-1206	N/A	56000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
132	Armstrong	6098B08930	CAC30-3	30000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
133	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
134	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
135	CARRIER	0490A07143	585XA100-L6	48000	N/A	N/A	N/A	N/A	N/A	N/A	2X6	GAS
136	KING	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	N/A
137	RUUD	T320200545	RCGA36A2GG	36000	N/A	2000	N/A	N/A	N/A	N/A	N/A	GAS
138	Heil	L940676075	NU65100B1CB1	54000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
139	CENTRAL - LENNOX	N/A	G11-110	48000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
140	LENNOX	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
141	N/A	N/A	N/A	0	N/A	1993	N/A	N/A	N/A	N/A	N/A	GAS
142	American Standard	N/A	Freedom 90	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
143	American Standard	N/A	5000	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	N/A
144	CENTRAL	N/A	N/A	0	N/A	2007	N/A	N/A	N/A	N/A	N/A	GAS
145	Ruud	N/A	N/A	60000	90	1990	N/A	N/A	N/A	N/A	N/A	GAS
146	Carrier	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
147	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
148	Heil	L961662250	HTC5075BFC1	60000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
149	LENNOX	N/A	N/A	0	96	N/A	44" +	N/A	N/A	N/A	2X4	ELECTRIC
150	Ruud	T110200310	RCGA-24A26617X1	24000	N/A	N/A	N/A	N/A	N/A	N/A	2x6	GAS
151	YORK DIAMOND	6M343541	370E16-B	36000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
152	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Boiler
153	N/A	N/A	N/A	80000	92	2001	R38	N/A	R11	N/A	2x4	GAS
154	CENTRAL	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ELECTRIC
155	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x6	GAS
156	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
157	Heil	N/A	N/A	0	N/A	2009	N/A	N/A	N/A	N/A	N/A	GAS
158	LOW LENNOX ELITE	5183F04296	C16-31-1FF	42000	N/A	2006	N/A	N/A	N/A	N/A	2X4 UPSTAIRS,2X6	GAS
159	GENERAL ELECTRIC	509382	BLU060F924A0	24000	N/A	N/A	N/A	N/A	N/A	N/A	2X6	GAS
160	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
161	Goodman	109428711	U-32	32000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
162	Lennox	6006L00326	C33-30B-2F-3	30000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
163	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
164	TRANE	5452P075G	TXL03153HPCO	42000	N/A	2006	16"	N/A	N/A	N/A	2X4	GAS
165	INT'L COMFORT PRODUCTS	X034614339	EXD24F19C2	24000	N/A	2004	N/A	N/A	N/A	N/A	2X4	GAS
166	RHEEM	8400F55396	1Y16831	36000	N/A	2003	N/A	N/A	N/A	N/A	2X6	GAS
167	AMERICAN STANDARD	K26746941	TXC036C4HPB1	36000	N/A	N/A	N/A	N/A	N/A	N/A	2X4	N/A
168	Bryant	1094X2324	CD5BXW03000AAAA	300000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
169	N/A	N/A	N/A	80000	92	2005	R19	N/A	R19	N/A	2X6	GAS
170	RUUD	N/A	N/A	0	90+	2000	ADDED IN -	N/A	N/A	N/A	2X4	GAS
171	RUUD	N/A	N/A	0	95	N/A	N/A	N/A	N/A	N/A	N/A	N/A
172	N/A	N/A	N/A	0	N/A	2003	N/A	N/A	N/A	N/A	2X4 WALLS; 2X6 ATTIC	GAS
173	LENNOX ELITE	N/A	N/A	0	N/A	2002	18"	N/A	N/A	N/A	2X4	GAS
174	LENNOX	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
175	HEIL	N/A	DL90	0	N/A	1998	N/A	N/A	N/A	N/A	2X4	GAS
176	CENTRAL	N/A	COUNTRY AMERICAN	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
177	AM. STANDARD	H66A010981	UF-105AC3E3	60000	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
178	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
179	LENNOX	6003J57657	G51MP SERIES	36000	N/A	2004	N/A	N/A	N/A	N/A	2X4	GAS
180	Trane	K15543735	KL90DVUX060C936A	36000	N/A	N/A	N/A	N/A	N/A	N/A	2x4 & 2x6	GAS
181	Amama	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x6	GAS
182	Honeywell	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x6	GAS
183	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
184	Lennox	5895H02017	G21Q4-60	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
185	HEIL	X092354880	EDD4X30FA2	30000	N/A	2009	N/A	N/A	N/A	N/A	2X4	GAS
186	Rheem	N/A	N/A	0	90	N/A	N/A	N/A	N/A	N/A	2x4	GAS
187	CENTRAL	N/A	N/A	0	N/A	1999	N/A	N/A	N/A	N/A	N/A	GAS
188	N/A	N/A	N/A	0	N/A	1972	N/A	N/A	N/A	N/A	N/A	GAS
189	LENNOX	5188136511	C16-41W-1FF	36000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
190	LENNOX	6004B14525	C33-36B-2	36000	N/A	2003	N/A	N/A	N/A	N/A	N/A	GAS
191	LENNOX	6095H12492	C26-31-1	0	N/A	N/A	N/A	N/A	N/A	N/A	2X6	GAS
192	RHEEM CLASSIC	N/A	N/A	0	90	N/A	N/A	N/A	N/A	N/A	2X4	GAS
193	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	15	2x4	GAS
194	Goodman	94122003465	BMPN 120-5	46000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
195	CENTRAL	N/A	N/A	0	N/A	1970	N/A	N/A	N/A	N/A	N/A	GAS
196	Central	N/A	N/A	0	93.5	2007	N/A	N/A	N/A	N/A	N/A	ELECTRIC
197	CENTRAL	N/A	N/A	0	N/A	1983	N/A	N/A	N/A	N/A	N/A	GAS
198	CENTRAL	N/A	N/A	0	N/A	1962	N/A	N/A	N/A	N/A	N/A	ELECTRIC

ID	Type	SERIAL #	MODEL #	Size (btu/hr)	Efficiency	Year Installed	Insulation				Wall thickness	Wat Heat Fuel
							Ceiling	Joist	Wall	Attic		
199	FORCED AIR	N/A	N/A	100000	92	1988	N/A	R13	R19	R49	2x4	GAS
200	FORCED AIR	N/A	N/A	100000	60	1960	130	R6	R6	N/A	2x4	GAS
201	FORCED AIR	N/A	N/A	75,000	92	2005	N/A	R19	R13	R49	2x4	GAS
202	CENTRAL	N/A	N/A	0	N/A	2003	N/A	N/A	N/A	N/A	N/A	GAS
203	Central	1094X23027	CD5BXW03000AAAA	30000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
204	FORCED AIR	N/A	N	75000	92	2003	N/A	R19	R13	R33	2x4	GAS
205	Heil	H44376387	NU6K050AF02	36000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	N/A
206	FORCED AIR	N/A	N/A	100000	80	2000	N/A	R19	R13	N/A	2x4	GAS
207	CENTRAL	N/A	N/A	95000	70	1989	N/A	N/A	N/A	N/A	2x4	GAS
208	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
209	CENTRAL	N/A	N/A	75000	92	1992	R49	R19	R13	R49	2x4	GAS
210	CENTRAL	N/A	NUGM100EHB1	100000	92	1996	N/A	R19	R13	R19	2x4	GAS
211	CENTRAL	N/A	N/A	75000	92	2001	R38	R19	R13	N/A	2x4	GAS
212	Ruud	N/A	UGRA-06-EAMES	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
213	CENTRAL	N/A	N/A	60000	92	1992	R19	R19	R6	N/A	2x4	GAS
214	BOILER	N/A	N/A	0	N/A	1990	N/A	N/A	N/A	N/A	N/A	GAS
215	CENTRAL	N/A	N/A	75000	90	2006	R38	N/A	R11	N/A	2x4	GAS
216	CENTRAL	N/A	N/A	60000	92	2009	R19	R19	R13	R1	2x4	GAS
217	Coleman	5005718342	MG95060B12MP11	60000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
218	CENTRAL	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
219	N/A	N/A	N/A	0	HIGH	1996	N/A	N/A	N/A	N/A	N/A	GAS
220	Lennox	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	N/A
221	Ruud	N/A	N/A	0	90	N/A	N/A	N/A	N/A	N/A	2x6	GAS
222	RUUD	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
223	CENTRAL	N/A	N/A	0	N/A	2008	N/A	N/A	N/A	N/A	N/A	GAS
224	FORCED AIR	N/A	N/A	0	N/A	2006	N/A	N/A	N/A	N/A	N/A	N/A
225	Rheem	hm50702F03100M	RGR07EMAES	30000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
226	Lennox	6095B20683	C26-31-1	60000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
227	CENTRAL	N/A	N/A	0	N/A	1991	N/A	N/A	N/A	N/A	N/A	GAS
228	N/A	N/A	N/A	66000	92	2009	N/A	N/A	R11	R38+	2x4	GAS
229	LENNOX	5907630617	G43UF-3613-070-08	36000	N/A	N/A	N/A	N/A	N/A	N/A	2X4	N/A
230	RUUD	L930339749	DU2430B1	24000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
231	GOODMAN	611658299	CAPF1824A6AA	24000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
232	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
233	LENNOX	N/A	N/A	0	N/A	1991	N/A	N/A	N/A	N/A	2X4	GAS
234	GOODMAN	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
235	Lenox-Pulse	5887H05107	GI403-80-18	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
236	Ruud	DF5D302F42947767	UGDG-07EAUER	420000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
237	BOILER	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
238	CENTRAL	N/A	N/A	66000	90	1998	R11	N/A	R11	N/A	2X4	GAS
239	CENTRAL	N/A	N/A	0	N/A	2007	N/A	N/A	N/A	N/A	N/A	GAS
240	Rheem	N/A	RGAA125A	0	N/A	1976	N/A	N/A	N/A	N/A	N/A	GAS
241	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
242	CENTRAL	N/A	N/A	0	N/A	1989	N/A	N/A	N/A	N/A	N/A	GAS
243	CENTRAL	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
244	Central	N/A	N/A	69000	95	2008	N/A	N/A	N/A	N/A	N/A	GAS
245	BRYANT	5108A04694	340AAV048100ABSA	48000	N/A	N/A	N/A	N/A	N/A	N/A	2X6	GAS
246	CENTRAL	N/A	N/A	0	N/A	2007	N/A	N/A	N/A	N/A	N/A	GAS
247	N/A	N/A	N/A	0	N/A	2001	N/A	N/A	N/A	N/A	N/A	GAS
248	SCHAAL	840UB32483	SCU10B30A-1A	30000	N/A	2007	N/A	N/A	N/A	N/A	2X4	GAS
249	Honeywell	560099H35445	CAU30-3	30000	N/A	N/A	N/A	N/A	N/A	N/A	2x6	GAS
250	TempStar	N/A	NTG9075F6A3	75000	91	1999	N/A	R19	R11	R24	2x4	GAS
251	LENNOX	N/A	N/A	0	N/A	1995	N/A	N/A	N/A	N/A	N/A	N/A
252	Lennox	5894A21749	G2103-60-1	60000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
253	HEIL	L893136044	NUGK100DH07	36000	N/A	1987	N/A	N/A	N/A	N/A	2X4	GAS
254	LENNOX	5587L01444	W51-18-2	48000	N/A	1989	N/A	N/A	N/A	N/A	2X4	GAS
255	CENTRAL	N/A	N/A	0	N/A	2000	N/A	N/A	N/A	N/A	N/A	GAS
256	CENTRAL	N/A	N/A	0	N/A	1998	N/A	N/A	N/A	N/A	N/A	GAS
257	N/A	N/A	N/A	0	N/A	2000	N/A	N/A	N/A	N/A	N/A	GAS
258	N/A	N/A	MODEL 220	0	N/A	N/A	12"	N/A	N/A	N/A	2X6	GAS
259	Ruud	FY5D702F080803839	UGRB-07EMAES	54000	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
260	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
261	CENTRAL	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	GAS
262	CENTRAL	N/A	N/A	0	60	1976	N/A	N/A	R11	R24	2X4	GAS
263	LENNOX	5897H22961	G26Q3-75-3	36000	N/A	N/A	N/A	N/A	N/A	N/A	2X4	GAS
264	Amama	602675372	CLQ30-1B	N/A	N/A	2006	N/A	N/A	N/A	N/A	2x4	GAS
265	RHEEM	302528511	CLJ30-1A	30000	N/A	2003	N/A	N/A	N/A	N/A	N/A	GAS
266	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
267	N/A	N/A	N/A	0	92	2003	R43	N/A	R-17	R43	2x4	GAS
268	CENTRAL	N/A	N/A	0	N/A	2007	N/A	N/A	N/A	N/A	N/A	GAS
269	N/A	X041067031	EPP36F19C2	36000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
270	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
271	FORCED AIR	N/A	N/A	100000	80	2004	N/A	R19	R13	R49	2x4	GAS
272	FORCED AIR	N/A	N/A	100000	80	1986	R19	R19	R13	N/A	2x4	GAS
273	CENTRAL	N/A	N/A	0	N/A	2006	N/A	N/A	N/A	N/A	N/A	GAS
274	Central	N/A	N/A	0	N/A	1975	N/A	N/A	N/A	N/A	N/A	ELECTRIC
275	N/A	AH5001953	MITW50L013N12	42000	N/A	2004	N/A	N/A	N/A	N/A	2X4	GAS
276	TRANE	N/A	XB90	0	N/A	N/A	N/A	N/A	N/A	N/A	2X4	N/A
277	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
278	CENTRAL	N/A	N/A	0	N/A	2006	N/A	N/A	N/A	N/A	N/A	GAS
279	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
280	Ruud	N/A	90 Series	0	N/A	N/A	N/A	N/A	N/A	N/A	2x4	GAS
281	RUUD	N/A	N/A	0	N/A	1994	N/A	N/A	N/A	N/A	N/A	GAS
282	CENTRAL	N/A	N/A	0	N/A	2008	N/A	N/A	N/A	N/A	N/A	Tankless
283	CENTRAL	N/A	N/A	100000	80	2000	N/A	N/A	R11	R38	2x4	GAS
284	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
285	N/A	N/A	N/A	0	N/A	1973	N/A	N/A	N/A	N/A	N/A	GAS
286	FORCED AIR	N/A	G61MPV36B-070-06	70,000	94	2007	N/A	R19	R13	R38	2X4	GAS
287	US CRAFTMASTER	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
288	CENTRAL	N/A	N/A	0	N/A	1988	N/A	N/A	N/A	N/A	N/A	GAS
289	FORCED AIR	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
290	Lennox	Prior To Receiving	G23Q2/3-75-5	75000	80	1999	R38	R19	R11	R38	Prior To Receiving Survey	GAS
291	Goodman	Prior To Receiving	Prior To Receiving Survey	0	16	2006	Prior To	R3	R11	Prior	Prior To Receiving Survey	GAS

ID	Type	Size	SERIAL	Model #	Year Installed	Efficiency	Pipe Insulation	Low Flow Fixtures	Lighting Dimmable Fixtures	Non-Dimmable CFLs	Other Appliances Dishwasher	
1	Rheem	N/A	RHLN0705409442	22V40F1	N/A	N/A	N/A	N/A	0	95	31	1
2	STATE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	110	0	2
3	Ruud	N/A	RULN0916518102	PVP40F	N/A	N/A	N/A	N/A	0	45	0	1
4	N/A	50	N/A	PVRP50N	2005	N/A	NO	NO	0	78	0	1
5	Richmond	N/A	RMLN0305513920	6G50-36F	N/A	N/A	N/A	N/A	0	0	0	1
6	BRADFORD WHITE	N/A	FK12474090	MITW4056FBN	N/A	N/A	N/A	N/A	0	12	6	1
7	N/A	N/A	RHN61202110233	41V50	N/A	N/A	NO	YES	8	39	14	1
8	N/A	50	N/A	N/A	2003	N/A	N/A	NO	0	20	20	0
9	RHEEM	N/A	RHNG0402412885	21V40-38	N/A	N/A	N/A	N/A	0	20	4	1
10	RICHMOND	N/A	RMLN0608549452	6G50-3851	N/A	N/A	N/A	N/A	0	85	60	1
11	Rheem	N/A	42VR50-40T	BHLN0707527213	N/A	N/A	N/A	N/A	0	108	7	1
12	N/A	50	N/A	N/A	2004	N/A	N/A	SOME	0	0	0	0
13	Rinnai	N/A	08.05-13607	R75-Lsi	N/A	N/A	N/A	N/A	0	175	60	1
14	RHEEM	50	N/A	42VR50-40F	2007	N/A	No	Yes	0	39	79	1
15	State Select	N/A	0803A007622	GS6408YBRS	N/A	N/A	N/A	N/A	0	95	56	1
16	STATE SELECT	40	601505969	PR640NOR7	2007	N/A	NO	YES - 3	0	104	0	1
17	Kenmore	40	N/A	153.331443	2004	N/A	No	Yes	9	31	2	1
18	N/A	N/A	N/A	N/A	N/A	N/A	NO	NO	6	104	104	1
19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	110	104	1
20	Richmond	N/A	RMNG1298A49210	7K40	N/A	N/A	N/A	N/A	0	50	8	1
21	N/A	40	N/A	N/A	2001	0.06	NO	YES	20	0	0	1
22	RICHMOND	N/A	RMCMNO105412741	6640-36F1	2005	N/A	NO	NO	0	35	0	1
23	N/A	N/A	0944A021449	6CV50200	N/A	N/A	N/A	Y	0	30	5	1
24	N/A	40	N/A	N/A	2007	0.62	YES	NO	6	14	7	0
25	STATE	N/A	A96266004	PRV40NORTO	N/A	N/A	N/A	N/A	0	38	16	1
26	CROSLEY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	38	10	1
27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	30	8	0
28	Rheem	40	RHLN 0803V11100	41V40-40F	N/A	N/A	No	NO	8	11	4	1
29	STATE	N/A	9200437001	GS640YBRS	N/A	N/A	N/A	N/A	0	72	4	1
30	Bradford White	N/A	YB0910340	M4403T6EN12	N/A	N/A	NO	NO	0	35	17	1
31	N/A	N/A	N/A	N/A	2010	N/A	NO	YES	0	24	2	1
32	N/A	40	N/A	N/A	1996	N/A	NO	YES	0	56	8	1
33	State Select	40	0851A018510	GS640YBRS	2009	N/A	N/A	N/A	5	37	0	0
34	BRADFORD WHITE	N/A	AF4816832	MITW50L6BN12	N/A	N/A	N/A	N/A	0	28	9	1
35	N/A	40	B01424858	PR640NORT971	2000	N/A	N/A	N/A	0	50	12	1
36	N/A	50	N/A	N/A	2007	258	NO	YES - SHOWERS	0	60	20	1
37	RHEEM	N/A	1298A44705	41V50	N/A	N/A	NO	YES	0	66	5	1
38	PremierPlus	40	0046127615	G61-40T40-3NV	2008	N/A	NO	Yes	1	19	0	1
39	STATE	40	H93834140	PRV40NOVT6F	1993	N/A	NO	YES - SHOWERS	0	35-50	3	1
40	SMART WATER	N/A	GELN1106527563	PG40509AVJ00	2007	95	N	N	3	50	1	1
41	Rheem	N/A	RULN1105421648	P2-40F1	N/A	N/A	N/A	N/A	0	55	20	1
42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	70	0	1
43	STATE SELECT	N/A	J00201828	PR640NORT	N/A	N/A	N/A	N/A	0	84	6	1
44	N/A	40	N/A	N/A	N/A	254	NO	NO	1	40	34	1
45	BOILER	N/A	N/A	N/A	N/A	N/A	YES	YES	0	40	10	1
46	Whirlpool	N/A	6044130941	BFG2F4040T3NOV	N/A	N/A	N/A	N/A	0	45	8	1
47	AO Smith	N/A	AE83-17442-Z99	PGC30950F	N/A	N/A	N/A	N/A	0	63	3	1
48	RUUD	N/A	RULN06D4503716	PH2-40-40F	N/A	N/A	N/A	N/A	0	41	33	1
49	Rudd	N/A	RUNG0103417941	P40-38	N/A	N/A	N/A	N/A	0	66	32	1
50	N/A	40	N/A	N/A	2000	N/A	Yes	Yes	0	16	2	1
51	KENMORE	40	A93836953	153-334450	1993	N/A	N	N	3	0	20	0
52	Censible	N/A	D94452722	PRV50NBR70	N/A	N/A	N/A	N/A	0	87	23	2
53	RICHMOND	N/A	RMNG1001139223	7K40	N/A	N/A	N/A	N/A	0	45	7	0
54	Rinnai	N/A	08.10-202772	R75L5	N/A	N/A	N/A	N/A	0	58	14	1
55	RICHMOND	N/A	RMNG1102158280	7K40	N/A	N/A	YES	YES - SHOWER	0	55	8	1
56	STATE	N/A	B07J054492	GS6404BRT	N/A	0.62	N/A	N/A	0	22	0	1
57	State Select	N/A	L92792039	PRV40NORT6F	N/A	N/A	N/A	N/A	0	68	7	1
58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	8	0
59	Rheem	N/A	RHLN1206528561	42VP40F	N/A	N/A	N/A	N/A	0	42	2	1
60	A.O. SMITH	65	FOSA162432	6VRS0100	2005	N/A	NO	YES - 3 TOILETS	0	94	0	1
61	RHEEM	N/A	RHNG1202432503	21V4-38	2003	N/A	N/A	N/A	0	80	40	1
62	RHEEM	N/A	RHLN0803527017	41V40-40F	N/A	N/A	N/A	N/A	0	33	4	1
63	RUUD	40	RULN0802005299	PURP40NT	2008	HIGH	NO	NO	0	63	5	1
64	N/A	40	6E03092065-09	PE42M09AAH	N/A	N/A	N/A	Y	0	35	0	1
65	STATE	N/A	N/A	PRV40NOV1	1997	N/A	N/A	Y	0	72	20	1
66	STATE	50	N/A	PR6550NRR7	2000	0.62	N	Y	3	14	0	0
67	N/A	50	N/A	N/A	2003	N/A	NO	YES	0	60	0	1
68	N/A	40	N/A	N/A	2002	NOTLISTE	NO	YES	1	61	6	1
69	Rudd	N/A	RU0802508139	PEM40-1	N/A	N/A	N/A	N/A	0	38	22	1
70	RHEEM	50	N/A	81V52DC	1996	GOOD	N	N	0	0	9	1
71	Rheem	N/A	0492II3530	BIRS2DB	N/A	N/A	N/A	N/A	0	32	0	1
72	RHEEMGLAS FURY	N/A	RHNG0503431620	21V40-38	N/A	N/A	N/A	N/A	0	40	0	1
73	STATE	N/A	E98683432	PRV40NORT97L	2001	N/A	N/A	N/A	0	34	0	1
74	N/A	40	E02208682	640NORT	1998	263 Therms	No	yes	2	18	4	0
75	RICHMOND	40	RMLN0609423666	9G40-38F1	2009	N/A	Y	N/A	0	15	20	1
76	N/A	30	N/A	N/A	1998	0.062	YES	NO	0	14	3	1
77	State Select	N/A	0926A002351	GS640YBRT	N/A	N/A	N/A	N/A	0	35	10	1
78	Ruud	N/A	RULN-0204535743	PH-40-40F	N/A	N/A	N/A	N/A	0	72	19	1
79	BRADFORD WHITE	N/A	DB8778115	M440T6FBN	N/A	N/A	N/A	N/A	0	23	11	0
80	RELIACE 501	30	J89825025	530NSRT6	N/A	N/A	NO	NO	0	30	0	1
81	N/A	40	N/A	N/A	2000	N/A	NO	YES	3	12	0	1
82	STATE	30	N/A	CV30NST6	1996	OK	N	N	0	14	6	0
83	Rheem	N/A	RHNG0301423559	21V40-38	N/A	N/A	N/A	N/A	0	64	6	1
84	N/A	40	0916H008972	GUPH40100	2009	N/A	N/A	N/A	0	0	0	1
85	GENERAL ELECTRIC	40	N/A	P640509AVJ00	2008	N/A	No	No	0	20	12	0
86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	39	8	1
87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	40	3	1
88	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	41	31	1
89	Bradford White	N/A	CC7537031	M1TW4056BN1	2007	N/A	N/A	N/A	0	20	0	1
90	RHEEM	N/A	RHLN0606109582	41VRP40N	N/A	N/A	N/A	N/A	0	8	0	1
91	RUUD	N/A	107401548	P2-40F1	2007	N/A	N/A	N/A	0	66	11	1
92	N/A	50	N/A	N/A	N/A	N/A	N/A	N/A	0	0	58	1
93	Rudd	N/A	501781134	CAPF0258B2C	N/A	N/A	N/A	N/A	1	1	0	1
94	RUUD	50	RULN0204106815	PURP50N	2004	N/A	NO	YES	0	55	40	1
95	RHEEM	50	RHN60102152241	41V50	2004	40,000	N	N	0	40	10	1
96	RICHMOND	N/A	RM100122311	8MV40-2D	N/A	N/A	N/A	N/A	0	24	10	1
97	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	90	8	1
98	Richmond	N/A	RMLN0309512781	6G40PVW40F	N/A	N/A	N/A	N/A	0	15	0	1
99	Rheem	N/A	RHLN0209528540	42VR40-40F	N/A	N/A	N/A	N/A	0	19	12	1

ID	Type	Size	SERIAL	Model #	Year Installed	Efficiency	Pipe Insulation	Low Flow Fixtures	Lighting Dimmable Fixtures	Non-Dimmable CFLs	Other Appliances Dishwasher	
100	RICHARD INTGUE	40	1205410968	NDG-6G40-36F1	2008	N/A	YES	NO	0	130	65	1
101	Richmond	N/A	N/A	12GS-40F1	N/A	N/A	N/A	N/A	0	16	25	1
102	N/A	40	N/A	N/A	1995	56	NO	YES	18	48	9	1
103	N/A	40	N/A	N/A	1993	N/A	N/A	N/A	0	38	7	0
104	State Select	N/A	E90593710	PRV30NORT6	N/A	N/A	N/A	N/A	0	12	7	1
105	N/A	40	N/A	N/A	1988	N/A	N/A	NO	0	30	0	0
106	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	1
107	N/A	40	N/A	N/A	1995	N/A	Yes	Yes	0	32	5	1
108	N/A	40	N/A	N/A	1993	N/A	Yes	N/A	0	64	11	1
109	N/A	N/A	N/A	N/A	N/A	100000	NO	NO	0	20	2	1
110	RICHMOND	N/A	RM 1000615371	RMEKR50-2	N/A	N/A	NO	NO	0	28	0	1
111	RUUD	N/A	N/A	N/A	2007	N/A	NO	YES	0	10	0	1
112	KENMORE	N/A	B9775111C1	153-333130	N/A	N/A	N/A	N/A	0	18	13	0
113	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	25	20	0
114	State Select	N/A	J99349096	PR63ONORT	N/A	N/A	N/A	N/A	0	51	13	1
115	Reliance	N/A	H93766001	530NORT6F	N/A	N/A	N/A	N/A	0	62	0	0
116	RELIACE 501	N/A	N/A	530NSRT6	N/A	N/A	YES	YES	0	7	0	0
117	State Select	N/A	F85368216	GW-40-NRT4	N/A	N/A	N/A	N/A	0	38	10	1
118	N/A	30	N/A	N/A	2008	N/A	N/A	YES	0	25	15	0
119	LENNOX	N/A	N/A	N/A	1981	N/A	N/A	N/A	0	19	19	1
120	N/A	50	N/A	N/A	2000	N/A	N/A	NO	0	50	50	0
121	Montgomery Wards	40	N/A	SRM-33408	1991	N/A	yes	No	1	30	12	1
122	Craftmaster	N/A	18125223	G1F4034T3NV	N/A	N/A	N/A	N/A	0	20	0	0
123	CROSLEY	N/A	M94322879	C540 NORTO	N/A	N/A	N/A	N/A	0	46	10	0
124	HYDROJET	40	CJ8221976	M140T6FBN	2000	N/A	N	N	15	58	2	1
125	N/A	40	N/A	N/A	1995	N/A	N/A	NO	0	150	12	0
126	RUUD	N/A	RULN0110542114	PR2R40-40F	N/A	N/A	NO	NO	0	35	18	1
127	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	8	0	1
128	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	11	15	1
129	RUUD	N/A	RUN60603114379	P40S-32	N/A	N/A	N/A	N/A	0	11	0	1
130	RHEEM	N/A	RHNG1200102245	21V40-38	N/A	N/A	N/A	N/A	0	52	1	1
131	Rheem	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	35	0	1
132	Rheem	N/A	RHNG0698A1633	21V40-7	N/A	N/A	N/A	N/A	0	32	15	1
133	State Select	N/A	C97813143	PV4010R7960	N/A	N/A	N/A	N/A	0	7	13	1
134	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	11	1	1
135	GENERAL ELECTRIC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	70	4	1
136	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	10	4	1
137	SMITH PERRAGALS	N/A	MA87-765-30-299	PGCS40202	N/A	N/A	N/A	N/A	3	40	10	1
138	GENERAL ELECTRIC	N/A	9808-130660	303373N3	N/A	N/A	N/A	N/A	0	29	0	0
139	N/A	N/A	H97668403	5 40 NORS970	N/A	N/A	N/A	N/A	0	0	0	0
140	N/A	N/A	E96867032	PRV40NORTO	N/A	N/A	NO	NO	1	39	7	1
141	N/A	N/A	N/A	N/A	2009	N/A	Y	Y	0	30	0	1
142	Richmond	N/A	N/A	409998	N/A	N/A	N/A	N/A	0	0	0	1
143	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	18	10	1
144	N/A	30	N/A	N/A	N/A	N/A	N/A	NO	0	14	14	0
145	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	32	4	0
146	State Select	N/A	H96308773	PRV30IVCRT0	N/A	N/A	N/A	N/A	0	7	0	1
147	N/A	35	N/A	N/A	1994	N/A	NO	NO	0	0	0	0
148	Rheem	N/A	RHLN0803V11120	41V40-40F	N/A	N/A	N/A	N/A	0	34	0	0
149	N/A	N/A	N/A	L33-38B-2	N/A	N/A	YES	YES	0	40	0	1
150	State Select	N/A	J80817002	CV-30 NRT	N/A	N/A	N/A	N/A	0	14	14	0
151	N/A	30	YAO761534	M130TGENIO	2002	N/A	NO	YES	0	15	15	0
152	N/A	N/A	N/A	N/A	2010	N/A	N/A	N/A	0	8	0	1
153	N/A	40	N/A	N/A	2007	No	No	Yes	13	28	13	1
154	N/A	50	N/A	N/A	2006	N/A	NO	NO	0	6	0	1
155	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	19	0	0
156	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	13	0	1
157	State Select	N/A	N/A	N/A	2004	N/A	N/A	N/A	0	26	20	0
158	BRADFORD WHITE	N/A	B66454206	M2XRS04T6FBN7	2006	N/A	N/A	N/A	0	35	4	1
159	H+ POINT	N/A	HPNG0301420724	HG40T1A	N/A	N/A	N/A	N/A	0	17	4	0
160	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
161	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
162	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
163	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
164	N/A	N/A	RHLN1105532936	42URS0-40F	N/A	N/A	YES	YES	16	75	6	1
165	BRADFORD WHITE	N/A	AF4848283	M140T6FBN4	2004	N/A	N/A	N/A	0	30	5	1
166	RHEEM	N/A	RHN01200102239	21V40-38	2003	N/A	NO	NO	0	37	2	1
167	STATE	N/A	PRV40POVT1	896407951	N/A	N/A	N/A	N/A	0	100	0	1
168	State Select	N/A	694507870	N/A	N/A	N/A	N/A	N/A	0	85	23	1
169	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0	48	20	1
170	STATE	40	M97430147	PRV40NORT970	1998	33,000	N	Y	0	37	5	0
171	N/A	N/A	RULN0306416756	P2-40F1	N/A	N/A	N/A	N/A	0	38	5	0
172	RICHMOND	40	RMLNO106428369	9640-38F1	2006	N/A	YES	NO - FAUCET	7	23	5	1
173	N/A	N/A	GEN60801424957	6640T64	N/A	N/A	YES	YES	35	10	12	1
174	RHEEM	40	RHNGT202432504	21040-38	N/A	N/A	YES	NO	0	38	1	1
175	KENMORE	N/A	E94745967	153334450	1998	N/A	NO	YES	8	2	30	1
176	STATE	38	J05J034361	GS640YBR7	2009	250	N	N	0	30	0	0
177	BRADFORD	N/A	DC8888603	M140T6FBN	N/A	N/A	N/A	N/A	0	67	1	1
178	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	25	0	0
179	STATE	N/A	PRV30NORT970	S	1997	N/A	N/A	N/A	0	13	1	0
180	Power Vent	40	N/A	N/A	N/A	N/A	N/A	N/A	0	94	34	1
181	Crosley	40	N/A	N/A	1993	N/A	N/A	N/A	0	12	0	0
182	Reliance	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	26	10	0
183	INTEGRA EVERKLEEN	N/A	N/A	N/A	N/A	N/A	Y	N	50	50	6	1
184	State Select	N/A	G01213183	PR65ONBRT	N/A	N/A	N/A	N/A	0	18	2	1
185	RHEEM	50	RHNGI297127265	21V30-6	2009	N/A	YES	NO	0	35	10	0
186	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	41	20	1
187	N/A	40	N/A	N/A	N/A	N/A	N/A	YES	0	15	0	0
188	N/A	N/A	RULN0706404722	RUUD P2-40F1	2004	N/A	NO	NO	0	31	30	1
189	RUUD	40	RULN0210519373	PVP40FW	2010	N/A	YES	YES	2	30	15	1
190	RUUD	50	RULN1006507010	PH2R40-40F	2007	N/A	N/A	N/A	1	50	1	1
191	RHEEM	N/A	RHIN0209521366	42UR40-40F	N/A	N/A	NO	NO	0	40	5	1
192	RHEEM	N/A	MKB7-00475A8-299	P6CS30202	N/A	N/A	NO	NO	2	54	50	1
193	N/A	N/A	N/A	N/A	2008	NO	NO	N/A	1	9	0	1
194	State Select	N/A	F94668178	PRV40NRT0	N/A	N/A	N/A	N/A	0	30	4	1
195	N/A	40	N/A	N/A	2009	N/A	N/A	YES	0	5	4	0
196	N/A	40	N/A	N/A	2007	N/A	Yes	Yes	0	13	0	1
197	N/A	N/A	N/A	N/A	2005	N/A	N/A	N/A	0	5	7	0
198	N/A	60	N/A	N/A	2006	N/A	N/A	YES	0	16	0	0

ID	Type	Size	SERIAL	Model #	Year Installed	Efficiency	Pipe Insulation	Low Flow Fixtures	Lighting Dimmable Fixtures	Non-Dimmable CFLs	Other Appliances Dishwasher	
199	N/A	40	N/A	N/A	1998	56	Yes	Yes	5	37	10	1
200	N/A	50	N/A	N/A	2002	62	NO	NO	1	17	4	1
201	N/A	40	N/A	N/A	2005	0.62	Yes	Some	1	37	14	1
202	N/A	N/A	N/A	N/A	2003	N/A	N/A	NO	0	47	48	0
203	State Select	N/A	J94147888	PRV40NORT0	N/A	N/A	N/A	N/A	0	0	3	1
204	N/A	40	N/A	N/A	2004	0.62	N	N/A	0	1	24	1
205	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	34	12	1
206	N/A	40	N/A	N/A	2000	56	NO	YES	1	22	5	1
207	N/A	40	N/A	N/A	2010	67	NO	NO	24	21	18	0
208	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	1
209	N/A	40	N/A	N/A	2001	57	NO	YES	1	18	6	0
210	Ruud	40	N/A	PH2R40A	2006	62	YES	YES	4	28	0	1
211	N/A	40	N/A	N/A	1995	56	NO	NO	1	22	0	1
212	State Select	N/A	N/A	PR64-0-NORT	N/A	N/A	N/A	N/A	0	45	26	1
213	N/A	40	N/A	N/A	1985	56	NO	YES	0	24	9	0
214	N/A	40	N/A	N/A	2009	N/A	N/A	NO	0	3	0	0
215	N/A	40	N/A	N/A	2010	N/A	NO	YES	0	28	20	1
216	N/A	40	N/A	N/A	N/A	N/A	Yes	YES	0	28	10	1
217	Rheem	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	24	12	1
218	N/A	30	N/A	N/A	2002	N/A	N/A	N/A	0	5	0	0
219	N/A	N/A	N/A	N/A	1996	N/A	YES	N/A	0	0	0	1
220	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	26	8	1
221	State Select	N/A	J01248929	PR640NORT	N/A	N/A	N/A	N/A	0	60	0	0
222	N/A	30	693407003	PRV30NOR76F	N/A	33.500	N	N	0	35	8	0
223	N/A	40	N/A	N/A	2006	N/A	N/A	YES	0	20	20	0
224	N/A	N/A	N/A	N/A	2006	N/A	N/A	N/A	0	55	0	1
225	Star	M9512644	PRV40NORT0	N/A	N/A	N/A	N/A	N/A	0	37	18	1
226	GENERAL ELECTRIC	N/A	GELN0108541605	GG50T06AVH00	N/A	N/A	N/A	N/A	0	0	0	1
227	N/A	40	N/A	N/A	2010	N/A	N/A	YES	0	2	24	0
228	N/A	40	N/A	N/A	2009	No	No	No	6	57	2	1
229	RHEEM	N/A	RHLN1007S224249	42VP40FW	N/A	N/A	N/A	N/A	0	29	0	1
230	N/A	40	598345862	PR640NORT971	N/A	N/A	Y	Y	1	30	0	1
231	PIOMAX	N/A	0921A001647	GCV40200	N/A	N/A	N/A	N/A	0	8	0	0
232	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
233	RUUD	N/A	RULNO 308406577	P2-40F1	2005	N/A	N	Y	8	50	8	1
234	RICHMOND	N/A	RMLN0110410812	GG40-36F1	N/A	N/A	N/A	N/A	0	15	0	1
235	State Select	N/A	0851A018511	G5640YBRS200	N/A	N/A	N/A	N/A	0	33	0	0
236	Richmond	N/A	RMLN09033407405	5V40-36F	N/A	N/A	N/A	N/A	0	12	25	1
237	N/A	40	N/A	N/A	2009	N/A	N/A	YES	0	0	0	0
238	N/A	40	N/A	N/A	2002	GOOD	YES	NO	0	26	31	1
239	N/A	40	N/A	N/A	2000	N/A	N/A	YES	0	38	24	0
240	Bradford White	N/A	N/A	M140T6FBN	2008	N/A	N/A	N/A	0	117	3	1
241	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	1
242	N/A	30	N/A	N/A	1990	N/A	N/A	YES	0	10	32	0
243	N/A	50	N/A	N/A	N/A	N/A	N/A	NO	0	35	0	0
244	N/A	60	N/A	N/A	2002	N/A	No	Yes	2	12	0	0
245	RIANNAI	TANKLES	CU195-1886X07	R75L5	N/A	N/A	N/A	N/A	0	102	8	1
246	N/A	40	N/A	N/A	2007	N/A	N/A	YES	0	46	17	0
247	N/A	N/A	N/A	N/A	2001	N/A	N/A	NO	0	10	5	0
248	RUUD	40	RULN0310515903	RUGPRO40-40F	N/A	N/A	N	N	5	53	4	1
249	Rheem	N/A	RHNG0799169317	21V40-7	N/A	N/A	N/A	N/A	0	25	0	1
250	N/A	40	N/A	N/A	2009	No	Yes	Yes	0	24	35	1
251	N/A	N/A	N/A	PRU 40 NORIO	1991	40	NO	NO	0	0	0	1
252	State Select	N/A	M05A163447	GS640YBRT	N/A	N/A	N/A	N/A	0	85	25	1
253	RHEEM	50	RHNG0701132254	41V50	2005	N/A	YES	NO	0	66	20	1
254	SMART WATER	N/A	G650T06AUH00	GELN0807503615	2009	N/A	N/A	N/A	0	40	5	1
255	N/A	N/A	N/A	N/A	1998	N/A	N/A	NO	0	30	10	0
256	N/A	N/A	N/A	N/A	2010	N/A	N/A	YES	0	9	27	0
257	N/A	40	N/A	N/A	2000	N/A	N/A	N/A	0	0	0	0
258	N/A	N/A	D01405624	N/A	N/A	N/A	N	N	0	15	1	1
259	Bradford White	N/A	PF9436931	M140T6LN10	N/A	N/A	N/A	N/A	0	68	2	1
260	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
261	N/A	40	N/A	N/A	N/A	N/A	N/A	NO	0	16	12	0
262	N/A	40	N/A	N/A	2001	EF 57	N	Y	1	43	4	1
263	RUUD	N/A	RULN0404502962	PH2-40-40F	N/A	N/A	N/A	N/A	0	24	0	1
264	Rheem	40	RHLN0406104763	41VRP501V	2006	N/A	N/A	N/A	0	57	40	1
265	N/A	N/A	N/A	N/A	N/A	N/A	Y	Y	0	65	22	1
266	State	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	13	0	1
267	N/A	35	N/A	N/A	2003	90	Yes	NO	3	18	22	1
268	N/A	66	N/A	N/A	2007	N/A	N/A	N/A	0	20	10	0
269	FREY STAR	N/A	RHLN0909518889	42VR40-40F	2009	N/A	NO	NO	2	50+	4	1
270	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	18	15	1
271	N/A	40	N/A	N/A	2009	N/A	NO	YES	3	36	4	1
272	N/A	50	N/A	N/A	2007	62	YES	YES	0	28	21	1
273	N/A	30	N/A	N/A	2000	N/A	N/A	YES	0	6	14	0
274	N/A	30	N/A	N/A	1975	N/A	Yes	Yes	0	13	0	1
275	N/A	N/A	N/A	N/A	N/A	N/A	N	Y	8	52	30	1
276	RHEEM	N/A	N/A	41VR50-40TF	N/A	N/A	N/A	N/A	0	29	15	1
277	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	40	0	1
278	N/A	N/A	N/A	N/A	2006	N/A	N/A	N/A	0	0	0	0
279	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	1
280	State Select	N/A	C92559329	PRV40NORS6F	N/A	N/A	N/A	N/A	0	27	14	1
281	RHEEM	N/A	RHUV0803108847	41VRP50N	1994	230	N	N	0	72	3	1
282	N/A	60	N/A	N/A	2008	N/A	N/A	N/A	0	30	30	0
283	N/A	40	N/A	N/A	1999	57	NO	YES	0	41	2	0
284	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	0
285	Rheem	N/A	RHNG0998A00536	21V40-7	N/A	N/A	N/A	N/A	0	49	1	1
286	RICHMOND	40	N/A	5V40-7	1999	0.62	N	Y	1	19	6	1
287	N/A	N/A	9845135922	G1F4034T3NV	N/A	N/A	N/A	N/A	0	50	0	1
288	N/A	50	N/A	N/A	2000	N/A	N/A	YES	0	12	0	0
289	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	0	0	1
290	AO Smith	40	N/A	FVGL4041L	1999	Prior To	Prior To	Prior To Recieving	Prior To	Prior To	Prior To	Prior To Recieving
291	Bradford White	N/A	N/A	N/A	2006	N/A	N/A	N/A	Prior To	Prior To	Prior To	Prior To Recieving

ID	Clothes	Electric	Gas	Tube	Plasma	LCD	Desktop	Laptop	Cell	Electric	Gas	Microwave	Chest	Second	Demographics					
	Washer	Dryer	Dryer	Television	TV	TV	PC	PC	Phones	Stove	Stove		Freezer	Refrigerator	Adults	Children	Age1	Age2	Age3	Age4
1	1	1	0	4	0	2	1	1	2	1	0	1	1	1	2	0	0	0	0	0
2	2	2	0	3	0	1	2	0	2	1	0	2	0	1	2	0	0	0	0	0
3	1	1	0	0	0	3	0	1	2	1	0	1	0	0	2	0	0	0	0	0
4	1	1	0	0	0	4	0	2	4	1	0	1	1	1	3	0	0	0	0	0
5	1	1	0	2	0	4	1	1	2	1	0	1	0	1	2	0	0	0	0	0
6	1	1	0	1	0	2	1	1	3	1	0	1	1	0	3	0	0	0	0	0
7	1	1	0	4	0	0	1	1	3	1	0	1	1	1	3	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
9	1	1	0	4	0	3	0	1	2	1	0	1	1	1	2	0	0	0	0	0
10	1	0	1	0	0	0	1	1	2	1	1	2	0	2	2	0	0	0	0	0
11	1	1	0	3	0	0	3	2	3	1	0	1	1	1	3	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0
13	1	1	0	1	0	4	2	1	3	1	1	1	0	1	3	0	0	0	0	0
14	1	1	0	2	1	2	1	2	1	0	1	1	1	1	2	0	0	0	0	0
15	1	0	1	1	0	1	1	1	1	0	1	1	0	1	2	0	0	0	0	0
16	1	0	1	4	1	0	1	1	2	1	0	1	1	1	2	0	0	0	0	0
17	1	1	0	1	0	1	1	0	3	1	0	1	1	1	3	0	0	0	0	0
18	1	1	0	0	1	0	0	1	2	1	0	1	0	0	2	0	0	0	0	0
19	1	1	0	0	1	0	0	1	2	1	0	1	0	0	2	0	0	0	0	0
20	1	1	0	0	1	4	3	2	2	1	1	1	0	1	2	0	0	0	0	0
21	1	1	0	3	0	3	0	2	2	1	0	1	0	1	2	0	0	0	0	0
22	1	0	1	1	0	2	0	1	2	0	1	1	1	1	2	0	0	0	0	0
23	1	1	0	5	0	0	0	1	2	1	0	1	1	1	2	0	0	0	0	0
24	1	1	1	0	0	1	0	1	1	1	0	1	1	0	2	0	0	0	0	0
25	1	0	1	1	0	1	1	2	2	1	0	1	0	1	2	0	0	0	0	0
26	1	1	1	2	0	0	0	2	2	1	1	1	1	1	2	0	0	0	0	0
27	0	0	0	2	0	0	1	0	2	1	0	1	1	0	2	0	0	0	0	0
28	1	1	0	1	0	1	1	0	3	1	0	1	1	1	3	0	0	0	0	0
29	1	0	1	1	1	0	1	0	2	1	0	0	0	0	2	0	0	0	0	0
30	1	1	0	0	0	2	1	1	2	1	0	1	1	0	2	0	0	0	0	0
31	1	0	1	0	0	3	1	4	3	1	0	1	1	0	2	0	0	0	0	0
32	1	1	0	5	0	0	0	1	1	1	0	3	0	0	1	0	0	0	0	0
33	1	1	1	1	1	1	1	0	3	1	0	1	1	0	2	0	0	0	0	0
34	1	1	0	2	0	1	2	0	2	1	0	1	0	0	2	0	0	0	0	0
35	0	1	0	2	0	1	0	1	0	1	0	1	1	0	2	0	0	0	0	0
36	1	1	0	0	0	3	2	1	3	1	0	1	0	1	2	0	0	0	0	0
37	1	1	0	0	1	2	0	1	1	1	0	1	1	0	3	0	0	0	0	0
38	1	1	0	1	0	2	0	0	1	1	0	1	1	1	1	0	0	0	0	0
39	0	1	0	1	0	2	1	0	2	1	1	1	1	1	2	0	0	0	0	0
40	1	1	0	0	0	3	1	1	2	0	1	1	1	0	2	0	0	0	0	0
41	1	1	0	1	1	0	1	1	2	1	0	1	1	1	2	0	0	0	0	0
42	1	1	0	2	2	2	0	2	2	1	0	1	0	1	2	0	0	0	0	0
43	1	1	0	0	0	3	1	2	3	1	0	1	0	1	2	0	0	0	0	0
44	1	1	0	1	0	0	0	1	2	0	1	1	1	1	2	0	0	0	0	0
45	1	1	0	1	0	3	0	1	1	1	0	1	1	0	2	0	0	0	0	0
46	1	0	1	3	0	1	1	1	2	1	0	1	1	1	2	0	0	0	0	0
47	1	1	0	3	0	1	0	1	1	0	1	0	1	2	0	0	0	0	0	0
48	1	1	0	0	1	1	1	1	2	1	0	1	1	1	2	0	0	0	0	0
49	1	1	0	0	0	2	1	0	2	1	0	1	1	0	2	0	0	0	0	0
50	1	1	0	1	0	2	1	0	3	1	0	1	1	0	2	0	0	0	0	0
51	1	0	1	2	0	1	3	0	2	0	1	1	1	1	2	0	0	0	0	0
52	1	1	0	3	0	2	1	1	1	2	1	2	1	1	2	0	0	0	0	0
53	1	1	0	0	0	0	1	1	2	0	1	1	1	1	2	0	0	0	0	0
54	1	1	0	1	0	1	1	0	0	1	0	1	0	0	2	0	0	0	0	0
55	1	1	0	1	0	1	1	1	2	1	0	1	1	0	2	0	0	0	0	0
56	1	0	1	0	0	2	0	1	1	1	0	1	1	0	1	0	0	0	0	0
57	1	1	0	2	1	0	1	0	2	1	0	1	0	0	2	0	0	0	0	0
58	0	0	0	1	1	1	1	1	0	1	0	1	1	0	2	0	0	0	0	0
59	1	0	1	0	0	1	1	0	1	1	0	2	0	0	2	0	0	0	0	0
60	1	0	1	6	0	2	2	1	2	1	0	1	1	1	2	0	0	0	0	0
61	1	1	0	5	0	1	1	0	2	1	0	1	0	2	2	0	0	0	0	0
62	1	1	0	2	0	2	1	0	1	1	1	1	1	1	2	0	0	0	0	0
63	1	1	0	0	0	4	1	1	1	1	0	1	1	0	2	0	0	0	0	0
64	1	1	0	2	0	2	0	0	1	1	0	1	1	0	2	0	0	0	0	0
65	1	1	0	1	0	1	0	0	1	1	0	1	1	0	2	0	0	0	0	0
66	1	0	0	0	0	1	1	0	2	0	1	1	0	0	2	0	0	0	0	0
67	1	1	0	3	0	1	0	1	2	1	0	1	0	1	1	0	0	0	0	0
68	1	1	0	2	0	1	0	1	1	1	0	1	1	1	1	0	0	0	0	0
69	1	1	0	2	0	1	1	1	2	1	0	1	1	0	2	0	0	0	0	0
70	1	1	0	0	0	1	1	0	1	1	0	1	1	0	1	0	0	0	0	0
71	1	1	0	2	0	0	1	0	2	1	0	1	1	1	2	0	0	0	0	0
72	1	0	1	1	1	0	1	1	1	1	0	2	0	1	1	0	0	0	0	0
73	1	0	1	3	1	0	2	0	2	1	0	1	1	0	2	0	0	0	0	0
74	1	0	1	0	0	1	10	1	1	0	1	0	0	1	1	0	0	0	0	0
75	2	0	1	2	0	0	0	2	2	1	0	1	0	1	2	0	0	0	0	0
76	1	0	1	1	0	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0
77	1	0	1	0	0	4	1	0	0	1	0	1	0	0	1	0	0	0	0	0
78	1	1	0	4	0	1	0	0	2	1	0	1	1	1	2	0	0	0	0	0
79	1	1	0	3	0	1	0	0	1	1	0	1	1	1	1	0	0	0	0	0
80	1	1	0	2	0	2	1	1	2	1	0	1	1	0	2	0	0	0	0	0
81	1	0	1	0	1	0	1	0	1	1	0	1	0	0	2	0	0	0	0	0
82	1	1	0	0	0	1	1	0	1	0	1	1	1	0	1	0	0	0	0	0
83	1	1	0	3	0	1	1	1	2	1	0	1	0	0	2	0	69	70	0	0
84	1	1	0	0	0	1	1	0	2	1	0	1	0	0	2	0	0	0	0	0
85	1	1	0	2	0	0	1	1	2	2	0	1	1	1	2	0	0	0	0	0
86	1	1	1	4	0	0	1	0	2	1	0	1	1	1	2	0	0	0	0	0
87	1	1	0	3	0	0	1	0	1	1	0	1	1	1	2	0	0	0	0	0
88	1	1	0	3	0	0	1	0	1	1	0	1	0	1	2	0	0	0	0	0
89	1	0	1	1	0	3	1	0	1	1	0	1	0	0	1	0	0	0	0	0
90	1	1	0	0	0	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0
91	1	1	0	1	0	4	0	0	1	1	1	3	2	1	2	0	0	0	0	0
92	1	1	0	0	1	1														

ID	Clothes Washer	Electric Dryer	Gas Dryer	Tube Television	Plasma TV	LCD TV	Desktop PC	Laptop PC	Cell Phones	Electric Stove	Gas Stove	Microwave	Chest Freezer	Second Refrigerator	Demographics					
															Adults	Children	Age1	Age2	Age3	Age4
100	1	1	0	3	1	0	1	1	2	1	0	1	1	1	2	0	0	0	0	0
101	1	1	0	0	0	1	0	1	2	1	0	1	0	1	2	0	0	0	0	0
102	1	1	0	5	0	0	1	1	2	1	1	2	0	1	3	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
104	1	1	0	0	0	1	1	0	1	1	0	1	0	0	2	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
106	0	0	0	0	0	1	0	1	1	1	0	1	0	0	1	0	0	0	0	0
107	1	1	0	1	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0
108	1	0	1	0	0	2	2	0	2	1	0	1	1	1	2	0	0	0	0	0
109	1	1	1	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0
110	1	1	0	1	0	0	1	0	2	1	0	1	1	1	2	0	0	0	0	0
111	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	0	0	0	0	0
112	1	0	1	0	0	4	1	1	2	0	1	1	1	1	2	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
114	1	0	1	3	0	0	1	0	2	1	0	1	1	0	2	0	0	0	0	0
115	1	0	1	2	0	0	0	0	1	1	0	1	1	0	2	0	0	0	0	0
116	1	0	1	2	0	0	1	0	1	0	1	1	0	0	1	0	0	0	0	0
117	1	1	0	1	0	2	1	0	1	1	0	1	0	1	2	0	75	75	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
119	1	0	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
121	1	0	1	0	0	4	1	0	1	0	1	2	1	0	2	0	0	0	0	0
122	1	1	0	0	0	0	1	0	1	0	1	1	0	0	2	0	70+	70+	0	0
123	1	1	0	1	0	0	1	0	0	0	1	1	0	0	1	0	0	0	0	0
124	1	0	1	0	0	4	2	1	3	0	1	1	0	0	3	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
126	1	1	0	2	0	0	2	0	2	1	0	1	1	0	2	0	0	0	0	0
127	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1	0	81	0	0	0
128	0	0	0	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
129	1	1	0	0	0	3	1	0	1	1	0	1	0	0	1	0	0	0	0	0
130	1	1	1	2	0	0	1	0	1	1	0	1	1	0	1	0	0	0	0	0
131	1	1	0	1	1	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0
132	1	1	0	1	0	1	0	1	1	1	0	1	0	0	1	0	0	0	0	0
133	0	0	0	0	2	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
134	1	0	1	0	0	1	0	0	1	0	1	1	1	0	2	0	0	0	0	0
135	1	0	1	0	0	1	2	1	2	1	1	1	0	1	2	0	0	0	0	0
136	0	0	0	0	0	1	1	1	1	1	0	1	1	0	1	0	0	0	0	0
137	1	1	0	1	0	0	0	1	1	1	0	1	0	1	1	0	0	0	0	0
138	1	0	1	1	0	0	0	0	0	0	2	2	0	1	1	0	0	0	0	0
139	1	1	0	0	0	1	1	0	1	1	0	1	0	0	1	0	0	0	0	0
140	1	1	0	6	0	0	0	0	1	1	0	1	1	0	2	0	0	0	0	0
141	1	0	0	1	0	0	0	0	1	1	0	1	0	0	2	0	0	0	0	0
142	1	0	1	1	0	0	0	0	1	1	0	1	1	0	2	0	0	0	0	0
143	1	1	1	1	1	1	0	0	1	0	1	1	0	0	1	0	77	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
145	1	1	0	1	0	0	1	0	1	1	0	1	1	0	1	0	0	0	0	0
146	1	1	1	1	0	0	0	0	0	1	0	1	0	0	2	0	0	0	0	0
147	1	0	1	1	0	1	0	0	0	1	0	1	0	1	2	0	0	0	0	0
148	1	1	0	2	0	0	0	1	2	1	0	1	0	2	2	0	0	0	0	0
149	1	1	0	1	0	2	0	0	0	1	0	1	0	0	2	0	0	0	0	0
150	1	0	1	2	0	0	0	0	2	0	1	1	1	1	2	0	0	0	0	0
151	1	0	1	2	0	0	0	0	1	1	1	1	1	0	2	0	0	0	0	0
152	1	1	0	3	0	0	0	0	0	0	1	1	0	0	3	0	0	0	0	0
153	1	0	1	3	0	0	1	0	1	0	1	1	0	1	1	0	0	0	0	0
154	1	1	0	3	0	0	0	0	2	0	1	1	0	0	2	0	0	0	0	0
155	1	1	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0
156	0	0	0	0	0	1	0	0	1	1	0	1	0	0	1	0	0	0	0	0
157	1	0	1	0	0	2	0	0	1	0	1	1	1	0	1	0	0	0	0	0
158	1	0	1	1	0	1	1	0	2	1	0	1	0	1	2	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	1	1	0	1	0	2	0	1	2	1	0	2	1	1	2	0	0	0	0	0
165	0	1	0	1	1	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0
166	1	1	0	3	0	0	1	1	2	1	0	1	1	0	2	0	0	0	0	0
167	1	0	1	1	0	3	0	2	2	1	0	1	0	0	2	0	0	0	0	0
168	1	1	0	0	0	0	1	0	1	1	0	1	0	0	2	0	0	0	0	0
169	1	1	0	1	0	0	0	2	0	2	0	2	0	3	2	0	0	0	0	0
170	1	1	0	2	0	0	1	0	2	1	0	1	1	1	2	0	0	0	0	0
171	1	1	0	1	0	2	0	1	2	1	0	1	1	1	2	0	0	0	0	0
172	0	0	1	0	0	5	0	1	1	1	0	2	1	1	2	0	0	0	0	0
173	1	0	1	3	0	1	0	0	1	1	0	1	1	0	2	0	0	0	0	0
174	1	0	1	1	0	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0
175	1	1	0	2	0	2	1	1	2	2	0	1	1	1	2	0	0	0	0	0
176	1	1	0	0	0	1	0	0	0	1	0	1	1	1	1	0	0	0	0	0
177	1	1	0	2	0	0	0	0	1	1	0	1	1	1	2	0	0	0	0	0
178	1	0	1	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
179	1	0	1	4	0	0	1	1	1	1	0	2	0	0	2	0	0	0	0	0
180	1	1	0	0	0	2	1	2	2	1	0	2	1	1	2	0	0	0	0	0
181	1	0	0	0	0	1	0	0	1	0	1	1	0	0	1	0	0	0	0	0
182	0	0	0	3	0	0	1	1	1	1	0	1	1	0	2	0	0	0	0	0
183	1	1	0	2	0	0	1	0	1	1	0	1	0	0	2	0	0	0	0	0
184	1	1	0	0	0	0	0	2	2	1	0	1	0	0	2	0	0	0	0	0
185	1	0	1	2	1	0	1	0	1	1	0	1	1	0	1	0	0	0	0	0
186	1	1	0	0	0	4	1	0	2	0	1	1	1	1	2	0	0	0	0	0
187	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
188	1	2	0	1	0	0	1	0	0	1	0	1	1	1	1	0	0	0	0	0
189	1	0	1	1	0	0	1	2	2	1	1	2	0	1	2	0	0	0	0	0
190	0	1	0	0	0	1	1	0	0	1	0	1	0	0	2	0	0	0		

ID	Clothes	Electric	Gas	Tube	Plasma	LCD	Desktop	Laptop	Cell	Electric	Gas	Microwave	Chest	Second	Demographics					
	Washer	Dryer	Dryer	Television	TV	TV	PC	PC	Phones	Stove	Stove		Freezer	Refrigerator	Adults	Children	Age1	Age2	Age3	Age4
199	1	0	1	0	0	2	1	0	2	1	0	1	0	0	2	0	0	0	0	0
200	1	1	0	3	0	0	1	1	3	1	0	1	1	0	3	0	0	0	0	0
201	1	1	1	0	0	2	1	1	2	1	0	1	1	1	2	0	0	0	0	0
202	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
203	1	1	1	2	0	1	1	1	2	0	1	1	0	1	2	0	0	0	0	0
204	1	1	0	1	0	1	0	1	1	1	0	1	1	0	2	0	0	0	0	0
205	1	0	1	0	0	0	1	1	2	0	1	1	2	0	2	0	0	0	0	0
206	1	1	0	0	0	1	1	1	1	1	0	1	0	0	1	0	0	0	0	0
207	1	0	0	0	0	1	0	0	1	1	0	1	1	1	2	0	0	0	0	0
208	1	0	1	0	1	1	3	1	1	1	0	1	0	0	2	0	0	0	0	0
209	1	1	0	1	0	1	0	0	1	1	0	1	0	0	2	0	0	0	0	0
210	1	1	0	0	0	1	0	0	1	1	0	1	1	1	1	0	0	0	0	0
211	1	1	0	1	0	2	0	1	1	1	0	1	0	1	1	0	0	0	0	0
212	1	0	1	0	1	2	1	0	1	1	0	1	1	0	1	0	0	0	0	0
213	1	1	0	2	0	2	0	0	1	2	0	2	1	1	1	0	0	0	0	0
214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
215	1	1	0	3	0	1	0	0	1	1	0	1	0	1	2	0	0	0	0	0
216	1	1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	0	0	0
217	1	1	1	1	0	1	1	0	1	0	1	1	1	0	2	0	0	0	0	0
218	1	0	1	0	0	1	1	0	1	0	1	1	1	0	2	0	0	0	0	0
219	1	1	0	0	1	0	1	0	2	1	0	1	1	1	2	0	0	0	0	0
220	1	1	1	1	0	1	1	1	2	1	0	1	0	0	2	0	0	0	0	0
221	0	0	0	2	0	2	0	2	3	0	1	1	1	0	2	1	14	0	0	0
222	1	1	0	2	0	1	2	2	3	1	0	1	1	1	2	1	18	0	0	0
223	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
224	1	1	0	2	0	1	2	2	2	0	1	1	0	1	2	1	2	0	0	0
225	1	1	1	0	0	2	1	1	3	0	1	1	0	0	2	1	18	0	0	0
226	1	1	0	0	0	1	1	1	1	0	1	1	1	0	2	1	16	0	0	0
227	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
228	1	1	0	3	0	0	1	0	3	1	0	1	0	0	1	1	18	0	0	0
229	1	1	0	0	0	1	1	0	1	1	0	1	1	0	1	1	15	0	0	0
230	0	1	0	2	0	0	1	0	2	1	0	1	2	0	2	1	5	0	0	0
231	1	1	0	3	0	0	0	0	2	0	1	1	0	0	1	1	14	0	0	0
232	1	1	0	1	1	2	1	2	1	0	1	1	0	0	2	1	10	0	0	0
233	1	1	0	1	0	0	2	0	2	0	1	1	1	0	2	1	12	0	0	0
234	0	0	1	0	0	1	0	1	3	1	0	1	0	0	2	1	10	0	0	0
235	1	0	1	3	0	1	0	0	0	1	0	1	0	0	4	1	0	0	2	0
236	1	1	0	1	0	0	1	1	1	1	0	1	1	0	1	1	13	0	0	0
237	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
238	1	1	0	0	1	1	2	0	2	1	0	1	1	1	4	1	1	0	0	0
239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0
240	1	1	0	1	0	0	1	1	2	1	0	1	0	1	2	1	15	0	0	0
241	1	1	1	1	1	1	1	1	3	1	1	1	1	1	2	1	16	0	0	0
242	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
243	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0
244	1	1	0	1	0	0	1	0	0	1	0	1	0	0	2	1	1	0	0	0
245	1	1	0	0	0	3	1	1	4	1	0	1	1	0	2	2	10	12	0	0
246	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
247	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
248	1	0	1	2	0	2	1	2	3	1	0	1	1	1	2	2	7	10	0	0
249	1	1	0	2	0	1	1	1	2	1	0	1	0	0	2	2	1	1	0	0
250	1	1	0	3	0	0	1	0	2	1	0	1	1	0	2	2	9	6	0	0
251	0	1	0	0	0	5	2	0	4	1	0	1	1	1	2	2	15	15	0	0
252	1	1	0	2	0	1	1	1	3	1	0	1	2	1	2	2	18	17	0	0
253	1	0	1	2	0	3	1	0	4	2	0	1	1	1	2	2	16	14	0	0
254	1	1	0	1	1	3	0	3	4	1	0	1	0	1	2	2	15	11	0	0
255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0
256	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0
257	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
258	1	1	0	2	0	1	1	1	2	1	0	1	1	0	2	2	3	1	0	0
259	1	1	0	2	0	1	3	5	4	0	1	1	0	1	2	2	13	15	0	0
260	1	1	0	2	0	0	2	1	0	1	0	0	0	0	2	2	1	3	0	0
261	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
262	1	1	0	2	0	1	0	1	2	1	0	1	0	0	2	2	6	3	0	0
263	1	1	0	1	0	0	1	1	2	1	0	1	0	1	2	2	2	1	0	0
264	1	1	0	2	0	1	1	1	2	1	0	1	0	1	2	2	1	7	0	0
265	1	1	0	1	0	1	0	0	1	1	0	1	0	0	2	2	9	5	0	0
266	1	1	0	3	0	0	2	1	4	1	0	1	0	0	2	2	0	0	0	0
267	1	0	1	4	0	0	1	2	4	0	1	1	0	1	3	2	0	0	0	0
268	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0
269	1	1	0	2	0	1	1	2	2	1	0	1	0	1	2	2	7	3	0	0
270	1	1	0	1	0	2	1	1	4	1	0	1	1	0	4	2	13	16	0	0
271	1	1	0	2	0	1	1	2	2	1	0	1	0	1	2	2	0	0	0	0
272	1	0	1	3	0	1	0	1	2	1	0	1	0	1	2	2	7	12	0	0
273	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2	2	0	0	0	0
274	1	0	1	2	0	0	1	0	2	1	1	1	0	0	1	2	5	9	0	0
275	1	1	0	2	0	1	1	0	2	1	0	1	1	1	2	3	10	8	4	0
276	1	1	0	2	4	0	4	0	5	1	0	2	1	1	2	3	0	0	0	0
277	1	1	0	0	0	3	1	0	4	0	1	1	0	1	2	3	10	13	16	0
278	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0
279	1	1	0	1	0	1	1	1	2	0	1	1	0	0	2	3	1	1	7	0
280	1	1	0	2	0	0	1	1	3	0	1	1	0	0	2	3	9	13	15	0
281	1	1	0	1	1	5	1	2	4	1	0	1	0	1	1	3	12	15	17	0
282	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	0	0	0	0
283	1	0	1	1	0	1	2	2	2	1	0	1	1	0	2	3	1	2	6	0
284	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	14	14	10	8
285	1	1	0	0	3	0	1	1	4	1	0	1	0	0	2	4	10	3	9	13
286	1	0	1	0	0	1	1	1	2	1	0	1	1	0	2	4	8	11	15	18
287	1	0	1	3	0	1	1	2	2	0	1	1	2	0	2	4	2	5	9	15
288	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	5	0	0	0	0
289	1	1	0	3																

ID	Work at home	<25k	>25k <50k	>50k <75k	>75k >100k	Transportation		Vehicle1		Work Trips 1		School Trips 1			
						Sidewalk access	Trail Access	Gas/ Diesel/ Other	MPG	Class of Vehicle	Miles to Work	How Made	Alternate Work Trips	School Trip Miles	How Made
1	No				X	YES	YES	GAS	22	Car (4-door)	20.0	Car	N/A	N/A	N/A
2	YES, 1				X	YES	YES	GAS	20	Car (4-door)	0.0	N/A	N/A	N/A	N/A
3	Yes				X	YES	YES	GAS	18	SUV	38.0	Car	N/A	N/A	N/A
4	NO				X	N/A	N/A	GAS	18	FULL SIZE TRUCK	N/A	DRIVE	CARPOOL	N/A	N/A
5	No				X	YES	YES	GAS	25	Car (4-door)	4.0	Car	N/A	N/A	N/A
6	NO				X	YES	YES	GAS	25	SUV	4.0	CAR	BIKE	N/A	N/A
7	NO				X	YES	NO	GAS	17	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
8	NO				X	N/A	N/A	GAS	N/A	SUV	4.0	CAR	N/A	N/A	N/A
9	NO				X	YES	YES	GAS	20	SUV	6.0	CAR	NO	N/A	N/A
10	OCCASIONAL				X	YES	NO	GAS	N/A	FULL SIZE TRUCK	2.0	ONLY OCCUPANT	N/A	N/A	N/A
11	Both				X	YES	YES	GAS	17	Full Sized Truck	20.0	Car	N/A	N/A	N/A
12	YES, 1				X	N/A	N/A	GAS	N/A	SUV	64.0	CAR	NO	N/A	N/A
13	No				X	NO	NO	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
14	No				X	YES	YES	GAS	19	MINIVAN	86.7	Car	N/A	N/A	N/A
15	Both				X	YES	Poor	GAS	23	Compact (M.B. SL 500)	15.0	Car	Rideshare/Carp	N/A	0
16	N/A				X	YES	YES	GAS	15	LIGHT PICK UP TRUCK	14.3	CAR	N/A	N/A	N/A
17	No				X	YES	NO	GAS	18	SUV	0.5	Car	Car	N/A	N/A
18	N/A				X	YES	YES	HYBRID	42	Car (4-door)	N/A	N/A	N/A	N/A	N/A
19	PT				X	YES	YES	GAS	42	Car (4-door)	N/A	N/A	N/A	N/A	N/A
20	No				X	YES	YES	GAS	48	Car (4-door)	24.0	N/A	N/A	N/A	N/A
21	NO				X	N/A	YES	GAS	26	Car (4-door)	40.0	CAR	NO -	N/A	N/A
22	NO				X	YES	NO	GAS	32	Car (4-door)	50.0	DRIVE	NO,	N/A	N/A
23	NO				X	YES	N/A	GAS	17	FULL SIZE TRUCK	30.0	RIDESHARE	NO,	N/A	N/A
24	N/A				X	NO	NO	GAS	20	LIGHT PICK UP TRUCK	34.0	CAR	NO,	N/A	N/A
25	YES, 1				X	YES	YES	GAS	28	Car (4-door)	10.0	CAR/BIKE/WALK	N/A	N/A	N/A
26	NO				X	YES	YES	GAS	26	SUV	2.0	WALK	N/A	N/A	N/A
27	No				X	YES	NO	GAS	20	Full Sized Truck	1.0	Car	N/A	N/A	N/A
28	No				X	YES	YES	GAS	20	Light Pickup	6.0	Car	N/A	N/A	N/A
29	YES				X	YES	YES	GAS	15	SUV	25.0	ONLY OCCUPANT	N/A	N/A	N/A
30	NO				X	NO	NO	GAS	25	Car (4-door)	20.0	CAR	Rideshare/Carp	N/A	N/A
31	NO				X	NO	NO	GAS	17	SUV	17.5	CAR	N/A	N/A	N/A
32	NO				X	YES	YES	GAS	21	MINIVAN	N/A	N/A	N/A	N/A	N/A
33	No				X	YES	NO	GAS	20	MINIVAN	1.0	Car	N/A	N/A	N/A
34	NO				X	NO	NO	GAS	30	LIGHT PICKUP TRUCK	17.0	CARPOOL	NO -	N/A	N/A
35	NO				X	YES	YES	GAS	30	Car (4-door)	N/A	N/A	N/A	N/A	N/A
36	NO				X	YES	NO	GAS	27	Car (4-door)	30.0	DRIVE	N/A	N/A	N/A
37	NO				X	N/A	N/A	GAS	18	Car (4-door)	2.0	CAR/WALK/BIKE	N/A	N/A	N/A
38	No				X	YES	YES	GAS	20	Light Pickup	18.0	Car	Car	N/A	N/A
39	N/A				X	YES	YES	GAS	24	Car (4-door)	N/A	N/A	N/A	N/A	N/A
40	NO				X	YES	YES	GAS	32	Car (4-door)	40.0	ONLY OCCUPANT	NO	N/A	N/A
41	Yes				X	YES	YES	GAS	15	Minivan	40.0	Car	N/A	N/A	N/A
42	Yes				X	YES	YES	GAS	16	Full Sized Truck	15.0	Car	N/A	N/A	N/A
43	N/A				X	YES	NO	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
44	N/A				X	YES	NO	GAS	20	SUV	20.0	CAR	NO - TOO	N/A	N/A
45	N/A				X	YES	NO -	GAS	21	LIGHT PICK UP TRUCK	2.0	N/A	N/A	N/A	N/A
46	Yes				X	YES	NO	GAS	18	Full Sized Truck	38.0	Car	N/A	N/A	N/A
47	No				X	YES	YES	GAS	25	Car (4-door)	1.0	Car	N/A	N/A	N/A
48	NO				X	YES	YES	GAS	18	LIGHT PICK UP	2.0	ONLY OCCUPANT	NO,	N/A	N/A
49	No				X	N/A	N/A	GAS	26	SUV	0.0	N/A	N/A	N/A	0
50	No				X	YES	NO	GAS	N/A	Compact	60.0	Car	N/A	N/A	N/A
51	NO				X	YES	YES	GAS	24	Car (4-door)	3.0	ONLY OCCUPANT	WALK, BIKE	N/A	N/A
52	Yes				X	NO	NO	GAS	30	Car (4-door)	34.0	Car	N/A	N/A	N/A
53	No				X	YES	YES	GAS	18	LIGHT PICKUP TRUCK	32.0	Car	N/A	N/A	N/A
54	No				X	YES	YES	GAS	30	Car (4-door)	0.3	Walk	N/A	N/A	N/A
55	NO				X	YES	YES	GAS	27	Car (4-door)	60.0	DRIVE	NO,	N/A	N/A
56	NO				X	YES	NO	GAS	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
57	No				X	YES	YES	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
58	NO				X	NO	NO	GAS	15	FULL SIZE VAN	N/A	N/A	N/A	N/A	N/A
59	No				X	YES	YES	GAS	24	Car (4-door)	N/A	N/A	N/A	N/A	N/A
60	YES, 1				X	YES	NO	GAS	18	Car (4-door)	41.1	CAR	NO, REAL	N/A	N/A
61	N/A				X	YES	YES	GAS	26	Car (4-door)	N/A	N/A	N/A	N/A	N/A
62	NO				X	YES	YES	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
63	N/A				X	NO	NO	GAS	20-24	Car (4-door)	N/A	N/A	N/A	N/A	N/A
64	NO				X	YES	YES	GAS	27	Car (4-door)	70.0	ONLY OCCUPANT	NO,	N/A	N/A
65	N/A				X	YES	YES	GAS	15	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
66	NO				X	NO	NO	GAS	27	SUV	20.0	ONLY OCCUPANT	N/A	N/A	N/A
67	NO				X	YES	YES	GAS	28	Car (4-door)	25.0	CAR	NO HOURS	N/A	N/A
68	N/A				X	YES	NO	GAS	18	Car (4-door)	N/A	N/A	N/A	N/A	N/A
69	No				X	YES	YES	GAS	N/A	Light Pickup	N/A	N/A	N/A	N/A	N/A
70	NO				X	YES	YES	GAS	20	MINIVAN	N/A	N/A	N/A	N/A	N/A
71	Yes				X	NO	NO	GAS	28	Car (4-door)	50.0	Car	Rideshare/Carp	N/A	N/A
72	N/A				X	YES	YES	GAS	23	Car (4-door)	N/A	N/A	N/A	N/A	N/A
73	N/A				X	N/A	N/A	GAS	19	SUV	18.0	ONLY OCCUPANT	NO,	N/A	N/A
74	No				X	YES	N/A	GAS	22	Car (4-door)	2.0	Car	N/A	N/A	N/A
75	NO				X	N/A	N/A	GAS	21	SUV	5.0	ONLY OCCUPANT	N/A	N/A	N/A
76	N/A				X	NO	NO	GAS	20	Car (4-door)	4.0	CAR	NO - TOO	N/A	N/A
77	No				X	YES	NO	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
78	No				X	YES	YES	GAS	21	Car (4-door)	N/A	N/A	N/A	N/A	N/A
79	N/A				X	NO	NO	GAS	23	MINIVAN	N/A	N/A	N/A	N/A	N/A
80	NO				X	YES	YES	GAS	26	COMPACT	3.6	CAR	N/A	N/A	N/A
81	N/A				X	YES	NO	GAS	20	MINIVAN	N/A	N/A	N/A	N/A	N/A
82	NO				X	YES	YES	GAS	35	Car (4-door)	17.0	ONLY OCCUPANT	RIDESHARE/	N/A	N/A
83	No				X	YES	YES	GAS	26	Car (4-door)	N/A	N/A	N/A	N/A	N/A
84	N/A				X	N/A	N/A	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
85	No				X	YES	YES	GAS	13	Full Sized Truck	60.0	Car	N/A	3	Car
86	NO				X	YES	YES	GAS	21	LIGHT PICK UP	6.0	CAR	NO - TOO	N/A	N/A
87	No				X	YES	YES	GAS	20	Car (4-door)	N/A	N/A	N/A	N/A	N/A
88	No				X	N/A	N/A	GAS	18	Car (4-door)	N/A	N/A	N/A	N/A	N/A
89	No				X	YES	YES	GAS	30	Car (4-door)	38.0	Car	N/A	N/A	N/A
90	N/A				X	YES	NO	GAS	30	Car (4-door)	N/A	N/A	N/A	N/A	N/A
91	NO				X	N/A	N/A	GAS	20	SUV	N/A	N/A	N/A	N/A	N/A
92	No				X	YES	YES	GAS	24	MINIVAN	N/A	N/A	N/A	N/A	N/A
93	No				X	YES	YES	GAS	N/A	Car (4-door)	24.0	Car	N/A	N/A	N/A
94	NO				X	N/A	YES	GAS	27	Car (4-door)	N/A	N/A	N/A	N/A	N/A
95	NO				X	N/A	N/A	GAS	34	Car (4-door)	N/A	N/A	N/A	N/A	N/A
96	NO				X	NO	NO	GAS	28	Car (4-door)	50.0	ONLY OCCUPANT	NO,	N/A	N/A
97	No				X	YES	YES	Gas &	37	Car (4-door)	N/A	N/A	N/A	N/A	N/A
98	No				X	YES	YES	GAS	22	Minivan	N/A	N/A	N/A	N/A	N/A
99	No				X	YES	YES	GAS	22	SUV	N/A	N/A	N/A	N/A	N/A

ID	Work at home	Income				Transportation		Vehicle1		Class of Vehicle	Work Trips 1		School Trips 1		
		<25k	>25k <50k	>50k <75k	>75k >100k	Sidewalk access	Trail Access	Gas/ Diesel/ Other	MPG		Miles to Work	How Made	Alternate Work Trips	School Trip Miles	How Made
100	N/A		X			N/A	N/A	GAS	22	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
101	No		X			YES	YES	GAS	22	Car (4-door)	48.0	Car	N/A	N/A	N/A
102	N/A		X			N/A	N/A	GAS	15	SUV	4.0	CAR	BIKE	N/A	N/A
103	N/A		X			N/A	N/A	GAS	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
104	No		X			YES	YES	Diesel	50	Car (4-door)	N/A	N/A	N/A	N/A	N/A
105	YES		X			N/A	N/A	GAS	N/A	COMPACT Car (4-door)	N/A	N/A	N/A	N/A	N/A
106	N/A		X			YES	YES	GAS	21	LIGHT PICK UP	10.0	CAR	NO - TOO	N/A	N/A
107	No		X			NO	NO	GAS	N/A	light pickup	25.0	Car	N/A	N/A	N/A
108	No		X			YES	YES	GAS	30	Car (4-door)	25.0	Car	N/A	N/A	N/A
109	N/A		X			NO	NO	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
110	1		X			NO	NO	GAS	15	FULL SIZE TRUCK	50.0	CAR	NO, NEED	N/A	N/A
111	N/A		X			NO	NO	NO	N/A	N/A	N/A	N/A	N/A	N/A	N/A
112	NO		X			YES	YES	GAS	13	SUV	N/A	N/A	N/A	N/A	N/A
113	N/A		X			N/A	N/A	GAS	N/A	SUV	N/A	N/A	N/A	N/A	N/A
114	No		X			YES	NO	GAS	20	Minivan	N/A	N/A	N/A	N/A	N/A
115	No		X			YES	YES	GAS	21.5	Minivan	N/A	N/A	N/A	N/A	N/A
116	N/A		X			YES	YES	GAS	35	Car (4-door)	2.0	CAR	WALK/BIKE	N/A	N/A
117	No		X			YES	NO	Other:	21	Car (4-door)	N/A	N/A	N/A	N/A	N/A
118	YES		X			N/A	N/A	GAS	N/A	LIGHT PICKUP TRUCK	60.0	CAR	N/A	N/A	N/A
119	NO		X			YES	YES	GAS	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
120	N/A		X			N/A	N/A	GAS	N/A	Car (4-door)	40.0	CAR	N/A	N/A	N/A
121	No		X			YES	YES	GAS	20	Car (4-door)	2.0	Car	N/A	N/A	N/A
122	No		X			YES	YES	GAS	18	Car (4-door)	N/A	N/A	N/A	N/A	N/A
123	NO		X			YES	YES	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
124	NO		X			YES	YES	GAS	23.25	Car (4-door) (2)	3.0	ONLY OCCUPANT	NO	N/A	N/A
125	YES		X			N/A	N/A	GAS	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
126	N/A		X			YES	NO	GAS	23	Car (4-door)	2.0	DRIVE	WALK	N/A	N/A
127	No		X			YES	NO	GAS	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
128	NO		X			YES	YES	GAS	N/A	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
129	NO		X			YES	YES	GAS	19	MINIVAN	N/A	N/A	N/A	N/A	N/A
130	No		X			NO	NO	GAS	28	Car (4-door)	N/A	N/A	N/A	N/A	N/A
131	No		X			NO	NO	GAS	30	Car (4-door)	N/A	N/A	N/A	N/A	N/A
132	No		X			YES	YES	GAS	25	Car (4-door)	0.0	0	N/A	N/A	N/A
133	No		X			YES	N/A	N/A	N/A	N/A	3.0	Bus	N/A	N/A	N/A
134	No		X			YES	YES	GAS	20	Car (4-door)	N/A	N/A	N/A	N/A	N/A
135	YES, 2		X			YES	NO	GAS	23	Car (4-door)	N/A	N/A	N/A	N/A	N/A
136	NO		X			NO	NO	GAS	25	SUV	0.5	CAR	WALK	N/A	N/A
137	N/A		X			N/A	N/A	GAS	26	Car (4-door)	N/A	N/A	N/A	N/A	N/A
138	No		X			N/A	N/A	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
139	N/A		X			YES	N/A	GAS	25	SUV	N/A	N/A	N/A	N/A	N/A
140	YES, 2		X			N/A	N/A	GAS	24	Car (4-door)	N/A	N/A	N/A	N/A	N/A
141	N/A		X			YES	YES	GAS	45	LIGHT PICK UP	N/A	N/A	N/A	N/A	N/A
142	No		X			YES	NO	GAS	N/A	Full Sized Truck	N/A	N/A	N/A	N/A	N/A
143	No		X			YES	NO	GAS	24	Car (4-door)	N/A	N/A	N/A	N/A	N/A
144	N/A		X			N/A	N/A	GAS	N/A	Car (4-door)	N/A	N/A	N/A	4	CAR
145	No		X			YES	NO	GAS	24	Car (4-door)	1.0	1	N/A	N/A	N/A
146	No		X			YES	YES	GAS	10	Light Pickup	N/A	N/A	N/A	N/A	N/A
147	N/A		X			YES	YES	GAS	23	MINIVAN	5.0	CAR	N/A	N/A	N/A
148	No		X			YES	YES	GAS	N/A	Minivan	2.6	Car	N/A	N/A	N/A
149	N/A		X			N/A	N/A	GAS	22	Car (4-door)	N/A	N/A	N/A	N/A	N/A
150	No		X			YES	YES	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
151	N/A		X			NO	N/A	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
152	Yes		X			YES	YES	GAS	20	MINIVAN	0.5	Walk/Bike	N	N/A	N/A
153	No		X			NO	YES	Yes	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
154	N/A		X			YES	YES	GAS	23	Car (4-door)	2.0	CAR	NO - AGE	N/A	N/A
155	No		X			YES	YES	GAS	30	Car (4-door)	2.0	Car	N/A	N/A	N/A
156	No		X			NO	NO	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
157	N/A		X			YES	NO	GAS	N/A	Car (4-door)	N/A	N/A	N/A	N/A	N/A
158	N/A		X			YES	N/A	GAS	18 TO 20	Car (4-door)	N/A	N/A	N/A	N/A	N/A
159	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
161	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
162	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
163	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
164	N/A		X			YES	NO	GAS	23	SUV	N/A	N/A	N/A	N/A	N/A
165	N/A		X			YES	NOT	GAS	31	Car (4-door)	N/A	N/A	N/A	N/A	N/A
166	N/A		X			YES	YES	GAS	24	Car (4-door)	N/A	N/A	N/A	N/A	N/A
167	NO		X			NO	NO	GAS	20	LIGHT PICK UP	40.0	CAR	N/A	N/A	N/A
168	No		X			YES	YES	GAS	21	Minivan	N/A	N/A	N/A	N/A	N/A
169	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
170	NO		X			YES	YES	GAS	15	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
171	N/A		X			YES	YES	GAS	23	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
172	N/A		X			NO	NO	GAS	21	SUV	N/A	N/A	N/A	N/A	N/A
173	N/A		X			YES	NO	GAS	23	MINIVAN	N/A	N/A	N/A	N/A	N/A
174	N/A		X			N/A	N/A	GAS	22	FULL SIZE TRUCK	N/A	N/A	N/A	N/A	N/A
175	N/A		X			YES	NO -	GAS	25	Car (4-door)	3.0	CAR	NO	N/A	N/A
176	N/A		X			YES	YES	GAS	25	Car (4-door)	N/A	ONLY OCCUPANT	N/A	N/A	N/A
177	NO		X			YES	NO	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
178	N/A		X			YES	NO	GAS	21	LIGHT PICK UP TRUCK	N/A	N/A	N/A	N/A	N/A
179	NO		X			YES	YES	GAS	20	SUV	N/A	N/A	N/A	N/A	N/A
180	No		X			NO	NO	GAS	20	SUV	1.3	Car	N/A	N/A	N/A
181	N/A		X			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
182	No		X			YES	YES	GAS	19	MINIVAN	N/A	N/A	N/A	N/A	N/A
183	N/A		X			N/A	N/A	GAS	20	Car (4-door)	N/A	N/A	N/A	N/A	N/A
184	Yes		X			NO	NO	GAS	30	Car (4-door)	14.0	Car	N/A	N/A	N/A
185	N/A		X			YES	NO	GAS	15	LIGHT PICK UP TRUCK	N/A	N/A	N/A	N/A	N/A
186	No		X			YES	YES	GAS	18.5	Car (4-door)	0.3	Car	Car	N/A	N/A
187	NO		X			N/A	N/A	GAS	N/A	Car (4-door)	60.0	CAR	N/A	N/A	N/A
188	N/A		X			N/A	N/A	GAS	25	Car (4-door)	N/A	N/A	N/A	N/A	N/A
189	N/A		X			NO	NO	GAS	38	Car (4-door)	N/A	N/A	N/A	N/A	N/A
190	N/A		X			YES	YES	GAS	21	Car (4-door)	N/A	N/A	N/A	N/A	N/A
191	NO		X			YES	N/A	GAS	25	Car (4-door)	1.0	DRIVE/WALK/BIKE	N/A	N/A	N/A
192	N/A		X			YES	NO	HYBRID	40	Car (4-door)	N/A	N/A	N/A	N/A	N/A
193	No		X			YES	YES	GAS	28	Car (4-door)	0.5	Car	N/A	N/A	N/A
194	No		X			YES	NO	GAS	22	SUV	N/A	N/A	N/A	N/A	N/A
195	NO		X			N/A	N/A	GAS	N/A	FULL SIZED TRUCK	17.9	CAR	N/A	0	N/A
196	YES		X			YES	YES	GAS	29	Car (4-door)	0.0	N/A	N/A	N/A	N/A
197	NO		X			N/A	N/A	GAS	N/A	Car (4-door)	22.9	CAR	N/A	0	N/A
198	NO		X			N/A	N/A	GAS	N/A	SUV	2.9	CAR	N/A	0	N/A

ID	Alternate				Extra-Cirr Trips 1				Car	Car Pool	Car some / walk other	Alternate walk	Alternate rideshare	Alternate bike	Alternate no	Errands 1		
	Walk	Rideshare	Bike	School Bus	No	Per Day	Miles	Per Day								Miles	Car - single trip	
1	N/A	N/A	N/A	N/A	N/A	7.0	100.0	100.0	0	0	0	0	0	0	0	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	15.0	28.6	N/A
3	N/A	N/A	N/A	N/A	N/A	2.0	10.0	Chain	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	N/A	N/A	N/A	N/A	N/A	3.0	40.0	40.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.7	14.3	N/A
7	N/A	N/A	N/A	N/A	N/A	0.1	17.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	4.3	N/A
9	N/A	N/A	N/A	N/A	N/A	0.3	2.1	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	N/A	N/A	N/A	N/A	N/A	2.0	5.0	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11	N/A	N/A	N/A	N/A	N/A	7.0	25.0	25.0	0	0	0	0	0	0	0	N/A	N/A	N/A
12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	3.6	N/A
13	N/A	N/A	N/A	N/A	N/A	10.0	100.0	90.0	10	0	0	0	0	0	0	N/A	N/A	N/A
14	N/A	N/A	N/A	N/A	N/A	3.0	72.0	72.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.0	20.0	N/A
15	0	0	0	0	0	15.0	10.0	10.0	0	0	0	0	0	0	0	N/A	N/A	N/A
16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.0	10.0	10
18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.1	28.6	N/A
19	N/A	N/A	N/A	N/A	N/A	8.0	200.0	Chain	N/A	N/A	N/A	x	N/A	N/A	N/A	N/A	N/A	N/A
20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	7.1	N/A
22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	N/A
23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	7.1	N/A
25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.1	8.6	N/A
26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.6	5.7	N/A
27	N/A	N/A	N/A	N/A	N/A	3.0	2.0	Car	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	5.0	5
29	N/A	N/A	N/A	N/A	N/A	10.0	100.0	CHAINED	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
30	N/A	N/A	N/A	N/A	N	0.5	7.0	7.0	N/A	N/A	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A
31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.7	28.6	N/A
32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	2.9	N/A
33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	20.0	20
34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	1.4	N/A
35	N/A	N/A	N/A	N/A	N/A	2.0	58.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.0	10.0	N/A
36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	10.7	N/A
37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	YES	N/A	N/A	N/A	N/A	N/A	0.1	1.0	N/A
38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.0	60.0	60
39	N/A	N/A	N/A	N/A	N/A	0.1	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	0.6	YES
40	N/A	N/A	N/A	N/A	N/A	0.3	50.0	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	0.7	X
41	N/A	N/A	N/A	N/A	N/A	4.0	50.0	50.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
42	N/A	N/A	N/A	N/A	N/A	3.0	100.0	100.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	41.1	41.1	YES
44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	1.4	N/A
45	N/A	N/A	N/A	N/A	N/A	0.4	1.4	N/A	YES	N/A	N/A	N/A	N/A	N/A	N/A	0.3	2.1	N/A
46	N/A	N/A	N/A	N/A	N/A	2.0	60.0	60.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
47	N/A	N/A	N/A	N/A	N/A	4.0	8.0	8.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
49	0	0	0	0	0	5.0	20.0	20.0	0	0	Yes	0	Yes	0	0	N/A	N/A	N/A
50	N/A	N/A	N/A	N/A	N/A	3.0	5.0	5.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	4.0	4
51	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	0.6	N/A
52	N/A	N/A	N/A	N/A	N/A	2.0	30.0	Car	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
53	N/A	N/A	N/A	N/A	N/A	15.0	100.0	Chain	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
54	N/A	N/A	N/A	N/A	N/A	2.0	40.0	40.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
55	N/A	N/A	N/A	N/A	N/A	7.0	10.7	CAR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	8.6	N/A
56	N/A	N/A	N/A	N/A	N/A	6.0	75.0	CHAINED	N/A	N/A	N/A	N/A	N/A	N/A	HEALTH	N/A	N/A	N/A
57	N/A	N/A	N/A	N/A	N/A	20.0	100.0	Car	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
58	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
59	N/A	N/A	N/A	N/A	N/A	6.0	18.0	18.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	3.6	YES
61	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	7.1	N/A
62	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
63	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	POSSIBLE	N/A	N/A	N/A	N/A	0.7	1.4	N/A
64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	10.0	X
65	N/A	N/A	N/A	N/A	N/A	1.0	8.0	ONLY	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	1.1	N/A
66	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	15.0	X
67	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	14.3	YES
68	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	10.0	YES
69	N/A	N/A	N/A	N/A	N/A	N/A	150.0	0.0	0	150	0	0	0	0	0	N/A	N/A	N/A
70	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.0	60.0	N/A
71	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	0.7	N/A
74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12.0	75.0	N/A
75	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.0	17.1	X
76	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	2.9	YES
77	N/A	N/A	N/A	N/A	N/A	20.0	30.0	Car	0	0	0	0	0	0	0	N/A	N/A	N/A
78	N/A	N/A	N/A	N/A	N/A	9.0	288.0	288.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
79	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.9	4.3	N/A
80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	28.6	N/A
82	N/A	N/A	N/A	N/A	N/A	4.0	12.0	X	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	5.0	X
83	N/A	N/A	N/A	N/A	N/A	5.0	115.0	Car	0	0	0	0	0	0	0	N/A	N/A	N/A
84	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	2.9	YES
85	N/A	N/A	N/A	N/A	N/A	2.0	8.0	8.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.0	N/A	N/A
86	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	2.9	YES
87	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
88	N/A	N/A	N/A	N/A	N/A	5.0	25.0	Car	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
89	N/A	N/A	N/A	N/A	N/A	4.0	20.0	20.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	7.1	YES
91	N/A	N/A	N/A	N/A	N/A	2.0	100.0	CHAINED	N/A	N/A	N/A	N/A	N/A	N/A	HEALTH	N/A	N/A	N/A
92	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.0	32.0	32
93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
94	N/A	N/A	N/A	N/A	N/A	0.3	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	0.6	YES
95	N/A	N/A	N/A	N/A	N/A	0.1	30.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	10.0	N/A
96	N/A	N/A	N/A	N/A	N/A	5.0	100.0	CHAINED	N/A	N/A	N/A	N/A	N/A	N/A	DISTANC	N/A	N/A	N/A
97	N/A	N/A	N/A	N/A	N/A	6.0	86.0	0.0	0	0	0	0	0</					

ID	Extra-Cirr Trips 2				Errands 2								Vehicle3					
	No	Per Day	Miles per day	How trips - car	How trips - car pool	Car some / walk	Alternate walk	Alternate rideshare	Alternate bike	Alternate no	Number	Miles	Car - single trip	Car - multi trip	Car - typically multi trip	Car / walk/ bike	Gas/ Diesel/ Other	MPG
100	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.6	14.3	N/A	N/A	N/A	N/A	N/A	N/A
101	N/	N/A	4.0	15.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
102	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	4.3	N/A	YES	N/A	NO - AGE	GAS	20
103	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	2.1	N/A	N/A	N/A	N/A	GAS	N/A
104	N/	N/A	7.0	154.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
105	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	5.0	N/A	N/A	N/A	N/A	N/A	N/A
106	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
107	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
108	N/	N/A	2.0	50.0	50.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
109	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	4.3	N/A	N/A	N/A	N/A	N/A	N/A
110	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.6	3.6	N/A	YES	N/A	NO -	N/A	N/A
111	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
112	N/	N/A	1.0	40.0	ONE TRIP @	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
113	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
114	N/	N/A	4.0	20.0	20.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
115	N/	N/A	2.0	10.0	10.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
116	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
117	N/	N/A	10.0	50.0	50.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
118	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	1.4	N/A	N/A	N/A	N/A	N/A	N/A
119	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
120	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.6	2.9	N/A	N/A	N/A	N/A	N/A	N/A
121	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
122	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
123	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
124	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
125	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
126	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	2.1	N/A	N/A	N/A	N/A	N/A	N/A
127	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
128	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
129	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
130	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
131	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
132	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
133	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
134	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
135	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.7	7.1	N/A	N/A	N/A	YES-	GAS	20
136	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
137	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
138	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
139	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
140	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.7	20.0	N/A	N/A	N/A	N/A	N/A	N/A
141	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
142	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
143	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
144	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
145	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
146	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
147	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	1.4	N/A	YES	N/A	N/A	N/A	N/A
148	N/	N/A	2.0	35.0	35.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
149	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
150	N/	N/A	5.0	20.0	20.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
151	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	0.7	N/A	N/A	N/A	N/A	N/A	N/A
152	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
153	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
154	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
155	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
156	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
157	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
158	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	4.3	N/A	YES	N/A	N/A	N/A	N/A
159	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
160	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
161	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
162	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
163	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
164	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.0	14.3	N/A	YES	N/A	N/A	N/A	N/A
165	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	1.4	N/A	N/A	N/A	N/A	N/A	N/A
166	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.6	2.9	YES	N/A	N/A	NO	N/A	N/A
167	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
168	N/	N/A	20.0	100.0	100.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
169	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
170	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10.0	5.7	X	N/A	N/A	NO,	N/A	N/A
171	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	3.6	N/A	N/A	N/A	N/A	N/A	N/A
172	N/	N/A	0.1	17.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
173	N/	N/A	1.0	100.0	YES	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
174	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
175	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	2.9	N/A	YES	N/A	N/A	N/A	N/A
176	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
177	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
178	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
179	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
180	N/	N/A	2.0	40.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
181	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
182	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
183	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
184	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
185	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.7	3.6	N/A	N/A	N/A	N/A	N/A	N/A
186	N/	N/A	7.0	20.0	20.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
187	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
188	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
189	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	8.6	N/A	N/A	N/A	N/A	N/A	N/A
190	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
191	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.0	14.3	N/A	YES	N/A	NO	N/A	N/A
192	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0	21.4	N/A	N/A	YES	N/A	N/A	N/A
193	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.0	125.0	125	N/A	N/A	N/A	N/A	N/A
194	N/	N/A	10.0	150.0	150.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
195	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
196	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
197	N/	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
198	N/	N/A	N/A															

ID	Car/ walk/ bike	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09	Jan 10	Feb 10	Mar 10	Apr 10	May 10	Jun 09	Jul 09	Aug 09	Sep 09	Oct 09	Nov 09	Dec 09	Jan 10	
		kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	kWh	Therms	Therms	Therms	Therms	Therms	Therms	Therms	Therms
1	N/A	586	645	1280	605	1802	929	745	828	1280	557	585	912	44	16	10	6	11	11	44	46	
2	N/A	1701	2301	2079	2074	2026	1808	1681	2689	4125	1997	3626	1946	21	15	7	4	7	9	21	24	
3	N/A	868	1057	1204	1203	1285	997	915	904	987	799	981	798	31	28	15	26	26	32	29	53	
4	N/A	1825	2305	2537	2530	2730	2001	1724	1904	1755	1579	1769	1300									
5	N/A	0	0	0	0	0	0	0	0	0	0	0	0	22	10	7	13	10	44	52	136	
6	N/A	736	736	1221	992	999	610	606	824	981	874	999	546									
7	N/A	633	611	950	972	811	572	691	976	1049	896	846	979	39	20	18	11	18	18	39	41	
8	N/A	441	561	1118	1047	1018	814	653	1039	1266	666	623	638									
9	N/A	534	723	1122	849	1086	616	633	880	883	551	596	443	28	20	17	11	16	15	21	21	
10	N/A	685	811	1251	1168	1271	742	784	835	888	622	713	521	38	24	12	8	14	12	35	43	
11	N/A	299	386	800	910	700	465	529	893	950	432	471	907	31	22	15	22	21	53	59	140	
12	N/A	463	446	1173	1275	1027	613	497	742	894	516	793	506	56	15	11	7	14	9	53	70	
13	N/A	1705	1764	2850	3056	2901	1792	1392	1698	1898	1634	1656	1941	144	222	125	127	105	327	261	146	
14	N/A	2070	2106	1848	1144	691	1007	2157	1101	1431	836	842	1437									
15	N/A	1341	1541	2542	2726	2247	1305	1161	1401	1751	1061	1110	1314	83	93	71	89	52	83	69	80	
16	N/A	965	935	1829	1631	1398	977	720	1152	835	370	330	337	38	21	11	18	13	31	73	182	
17	N/A	944	894	972	702	777	849	899	805	821	660	624	776	25	14	11	7	11	8	24	27	
18	N/A	418	506	1289	1047	1255	554	802	874	1308	701	905	990									
19	N/A	418	506	1289	1047	1255	554	802	874	1308	701	905	990	30	16	10	9	121	136	339	600	
20	N/A	1115	1037	1565	1025	1353	922	1860	2122	3794	2116	2735	1762									
21	N/A	381	464	647	613	1064	517	650	825	1698	578	663	651									
22	N/A	356	439	717	664	730	456	398	456	533	459	521	464									
23	N/A	1086	1426	2759	3149	2977	2286	926	1313	1263	839	863	1594	65	33	69	18	81	158	95	73	
24	N/A	408	154	655	771	480	427	508	551	862	539	585	429									
25	N/A	739	750	1225	1284	1114	916	763	952	1292	800	906	623									
26	N/A	340	380	773	668	753	410	438	478	574	475	588	356									
27	N/A	722	1158	1337	1402	1662	1062	797	929	930	779	862	605	52	15	10	5	12	11	58	73	
28	N/A	1086	1291	1467	1447	1530	1050	1047	1112	1323	1144	1093	957	63	25	17	10	16	17	58	74	
29	N/A	772	1776	2142	1871	2219	1412	767	850	962	714	635	569	14	12	9	7	48	57	160	279	
30	N/A	491	858	1601	1141	1434	759	574	684	700	581	713	536									
31	N/A	439	534	943	651	904	434	501	536	606	550	599	445									
32	N/A	518	677	812	830	807	511	372	154	178	163	182	160									
33	N/A	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned	Returned
34	N/A	699	720	1085	1126	1133	773	869	781	690	614	656	618									
35	N/A	330	441	611	574	774	462	388	439	468	410	465	364	34	24	19	12	19	20	31	34	
36	N/A	498	595	985	1012	1100	667	709	923	785	458	563	405									
37	N/A	275	467	579	425	543	378	404	339	596	341	448	439	24	18	14	8	13	13	23	28	
38	N/A	278	457	571	555	607	375	373	404	471	302	327	406									
39	N/A	852	902	1251	1271	928	855	1005	997	446	836	759	809	18	15	9	14	15	20	31	90	
40	N/A	422	479	585	481	673	444	551	554	641	532	597	414									
41	N/A	766	627	1113	1083	897	691	719	923	1165	832	773	840	45	16	9	4	11	7	25	37	
42	N/A	674	727	1039	1021	870	887	956	1119	1441	905	1013	942	42	10	9	5	10	8	46	59	
43	N/A	850	793	1206	1147	1382	786	1141	1069	760	484	569	554									
44	N/A	586	664	1122	860	1134	540	478	566	899	602	589	642	30	33	12	15	34	45	80	126	
45	N/A	468	511	1047	887	1016	536	441	488	504	440	488	384									
46	N/A	574	652	1066	933	916	582	664	684	710	642	640	569	31	21	19	6	13	13	39	41	
47	N/A	571	727	777	748	806	758	1062	929	929	786	929	592	58	16	6	4	5	8	41	50	
48	N/A	854	895	1530	1547	1340	855	797	1029	1405	930	1780	921									
49	N/A	718	661	1146	1125	1240	657	685	788	734	668	755	827	20	9	3	8	9	37	44	119	
50	N/A	368	733	781	746	879	897	912	697	597	532	626	581	14	12	7	10	10	22	30	71	
51	N/A	412	423	657	581	619	377	425	497	537	423	575	379	29	35	21	23	34	41	77	141	
52	N/A	1625	2210	4116	3906	3801	2125	1677	1576	1284	1342	1726	1203	147	119	74	105	69	201	294	471	
53	N/A	648	780	923	909	925	688	677	864	1162	1404	1018	739	25	14	12	5	12	10	32	30	
54	N/A	637	961	1133	984	1059	784	730	484	536	626	639	631	30	10	6	3	5	5	21	28	
55	N/A	335	324	580	414	560	309	569	527	454	468	485	319	37	0	0	0	0	33	64	187	
56	N/A	313	323	512	454	560	397	376	431	460	432	437	280									
57	N/A	0	0	0	0	0	0	0	1008	1124	787	657	596	55	26	10	6	12	10	58	74	
58	N/A	0	0	0	0	0	0	0	0	0	0	0	0									
59	N/A	205	196	208	189	217	165	294	355	394	364	415	282	16	16	8	12	14	30	43	114	
60	N/A	640	731	1138	997	1051	565	638	901	796	401	489	512	39	17	12	5	10	11	19	34	
61	N/A	864	856	1187	1158	1330	835	929	1137	1271	989	984	883	26	25	11	22	21	41	51	105	
62	N/A	477	847	1223	1161	930	760	667	647	642	235	304	479									
63	N/A	401	429	566	568	596	403	459	458	617	542	296	191									
64	N/A	282	977	909	728	873	706	789	536	1042	563	643	825	24	16	15	9	14	14	27	28	
65	N/A	378	379	597	667	534	356	517	549	561	457	517	366									
66	N/A	323	395	737	706	756	458	342	376	465	360	437	291	34	16	12	8	14	12	25	31	
67	N/A	791	1083	1361	1361	1259	948	837	819	1236	584	720	909									
68	N/A	743	868	1207	1174	966	652	819	940	1105	993	1091	747									
69	N/A	1170	1257	934	689	913	582	1134	1353	3157	1441	1933	729									
70	N/A	284	471	503	680	790	524	349	411	558	361	419	405									
71	N/A	800	920	1240	1160	1240	1040	880	1320	1280	920	920	1200									
72	N/A	296	369	849	637	654	370	523	607	752	590	637	431									
73	N/A	506	754	1076	1162	1226	892	762	1082	1581	894	684	532	38	17	10	4	10	10	50	62	
74	N/A	195	178	377	305	413	206	279	368	543	373	412	232	14	7	4	8	8	40	45	102	
75																						

ID	Feb 10	Mar 10	Apr 10	May 10
	Therms	Therms	Therms	Therms
1	141	274	210	115
2	45	62	47	24
3	89	73	57	35
4				
5	242	197	111	43
6				
7	119	211	172	106
8				
9	63	125	100	69
10	104	180	140	83
11	244	204	149	61
12	168	292	231	152
13	324	527	454	300
14				
15	186	355	278	188
16	234	150	93	41
17	66	117	97	66
18				
19	476	321	87	76
20				
21				
22				
23	174	291	248	165
24				
25				
26				
27	193	342	263	164
28	170	296	239	169
29	219	144	38	22
30				
31				
32				
33	Returned	Returned	Returned	Returned
34				
35	67	108	89	63
36				
37	94	185	140	77
38				
39	165	138	92	32
40				
41	101	176	142	96
42	146	258	197	131
43				
44	104	75	45	32
45				
46	89	110	88	61
47	143	258	208	146
48				
49	202	160	102	30
50	129	84	51	15
51	112	79	37	32
52	775	614	447	196
53	86	141	117	78
54	99	182	154	85
55	327	283	156	59
56				
57	184	313	124	133
58				
59	201	156	91	32
60	86	141	108	93
61	189	120	107	46
62				
63	76	126	95	57
64				
65	68	114	93	66
66				
67				
68				
69				
70				
71				
72				
73	130	195	189	126
74	168	130	88	83
75				
76				
77	159	129	88	29
78	268	232	128	38
79	228	347	283	213
80				
81	98	100	65	9
82				
83	154	261	226	135
84	230	176	118	34
85				
86	198	121	35	27
87	400	325	194	55
88				
89				
90	132	113	72	20
91	60	109	88	67
92	92	76	53	19
93	37	66	51	36
94	65	108	86	57
95	78	115	108	81
96	89	155	121	77
97	69	106	89	67
98	67	118	100	73
99	99	167	137	97

ID	Feb 10	Mar 10	Apr 10	May 10
	Therms	Therms	Therms	Therms
100	94	141	142	97
101	82	140	116	77
102				
103	88	148	124	86
104	52	80	67	47
105				
106				
107				
108				
109				
110				
111	110	173	143	107
112				
113	92	155	127	84
114	135	109	74	25
115	36	34	17	6
116				
117	131	110	69	26
118	49	109	117	42
119	218	172	128	55
120				
121	70	120	98	66
122	138	264	219	137
123	156	125	95	49
124				
125	311	209	160	42
126	154	232	203	127
127	37	56	46	29
128	80	120	119	83
129	74	61	41	14
130	123	92	68	25
131	88	132	101	76
132	119	196	157	107
133				
134	29	37	31	26
135	203	131	50	45
136				
137	204	164	116	39
138				
139	189	291	247	174
140				
141	104	170	138	92
142				
143	90	154	123	93
144	91	149	129	86
145				
146				
147	130	210	187	117
148				
149	88	147	121	90
150	109	90	64	25
151	67	119	95	67
152				
153				
154	70	121	104	66
155				
156				
157				
158	135	99	72	33
159				
160				
161				
162				
163	Returned	Returned	Returned	Returned
164	146	113	74	26
165	87	75	54	24
166				
167				
168				
169				
170	96	159	132	94
171	105	176	139	95
172				
173				
174				
175				
176	96	159	135	96
177	177	274	229	165
178				
179	119	195	159	108
180	88	151	17	84
181				
182				
183	46	31	32	28
184	135	109	72	26
185	71	124	104	69
186				
187				
188	74	84	95	79
189				
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191				
192	133	118	70	18
193				
194	182	307	275	163
195				
196				
197				
198				

ID	Feb 10	Mar 10	Apr 10	May 10
	Therms	Therms	Therms	Therms
199				
200	21	23	21	28
201	111	89	69	30
202				
203				
204				
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215				
216				
217				
218				
219				
220				
221	174	139	84	24
222	92	163	133	84
223				
224	121	205	160	107
225	210	170	110	44
226				
227	102	184	148	100
228	166	142	95	37
229	47	92	68	47
230	88	65	26	22
231	81	126	106	73
232				
233				
234				
235	197	148	96	28
236				
237				
238				
239				
240	247	174	54	44
241				
242				
243				
244				
245	293	267	159	45
246				
247				
248	199	160	109	46
249				
250	62	119	114	53
251				
252	96	166	127	79
253	168	298	246	155
254	175	291	242	135
255				
256				
257	102	186	145	90
258				
259				
260				
261				
262				
263				
264	102	158	116	77
265	95	162	140	96
266				
267	105	181	152	104
268				
269				
270				
271	7	10	12	22
272	29	20	18	21
273				
274				
275				
276				
277	167	102	36	17
278				
279	112	71	26	22
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APPENDIX E: RESIDENTIAL AUDITS

ID	Improvement	Recommended (Yes/No)	Existing	Proposed	Annual Energy Cost Savings	Implementation Cost	Incentives	Payback	Energy Saved (kWh)	Energy Saved (therms)
10	Basement Wall Insulation	No								
10	Duct Work	No								
10	Window caulking	No								
10	Reglaze windows	No								
10	Windows close tightly	No								
10	Window weatherstripping	No								
10	Window repair	No								
10	Door caulking	No								
10	Door weatherstripping	No								
10	Door repair	No								
10	Chimney infiltration	No								
10	Attic access infiltration	No								
10	Cantilever infiltration	No								
10	Seal wall corner infiltration	No								
10	Wall penetration	No								
10	Wall sill plate	No								
10	Refrigerator 1	No								
10	Refrigerator 2	No								
10	Freezer 1	No								
10	Freezer 2	No								
10	Television	No								
10	Clothes Washer	No								
10	Room air condition	No								
10	Install CFLs	No								
10	Occupancy sensors	No								
10	Power strip	No								
10	Unplug chargers	No								
10	Low-flow showerhead	Yes								
10	Pipe insulation	Yes								
10	Water Heater Blanket	Yes								
11	Attic Insulation	Yes	R13	R49	105	1042	729	2.5		
11	Band Joint Insulation	Yes	R4	R19	23.1	187	131	2.4		
11	Basement Wall Insulation	Yes	R4	R11	187	910	637	1.5		
11	Clock thermostat	Yes								
11	Crawl Space Insulation	Yes	R6	R19	31.5	429	300.3	4		
11	Heating	Yes		1960						
11	Cooling	No		2006						
11	Water heating system	No		2002						
11	Duct Work	No								
11	Faucet Aerator	No								
11	Low-flow showerhead	No								
11	Pipe insulation	No								
11	Kitchen Faucet aerator	No								
11	Window caulking	No								
11	Reglaze windows	No								
11	Windows close tightly	No								
11	Window weatherstripping	No								
11	Window repair	No								
11	Door caulking	No								
11	Door weatherstripping	No								
11	Door repair	No								
11	Chimney infiltration	No								
11	Attic access infiltration	No								
11	Cantilever infiltration	No								
11	Seal wall corner infiltration	No								
11	Wall penetration	No								
11	Wall sill plate	No								
11	Refrigerator 1	No								
11	Refrigerator 2	No								
11	Freezer 1	No								
11	Freezer 2	No								
11	Television	No								
11	Clothes Washer	No								
11	Room air condition	No								
11	Install CFLs	No								
11	Occupancy sensors	No								
11	Power strip	No								
11	Unplug chargers	No								
11	Wall Insulation	Yes	R6	R11	352.1	2662.8	750	5.5		
11	Water Heater Blanket	Yes								
12	Band Joint Insulation	Yes	R38	R19		93	65.1	22.9		
12	Basement Wall Insulation	Yes	R49	R11		992	694.4	297.6		
12	Clock thermostat	Yes								
12	Heating	No		2000						

ID	Improvement	Recommended (Yes/No)	Existing	Proposed	Annual Energy Cost Savings	Implementation Cost	Incentives	Payback	Energy Saved (kWh)	Energy Saved (therms)
10	Basement Wall Insulation	No								
10	Duct Work	No								
10	Window caulking	No								
10	Reglaze windows	No								
10	Windows close tightly	No								
10	Window weatherstripping	No								
10	Window repair	No								
10	Door caulking	No								
10	Door weatherstripping	No								
10	Door repair	No								
10	Chimney infiltration	No								
10	Attic access infiltration	No								
10	Cantilever infiltration	No								
10	Seal wall corner infiltration	No								
10	Wall penetration	No								
10	Wall sill plate	No								
10	Refrigerator 1	No								
10	Refrigerator 2	No								
10	Freezer 1	No								
10	Freezer 2	No								
10	Television	No								
10	Clothes Washer	No								
10	Room air condition	No								
10	Install CFLs	No								
10	Occupancy sensors	No								
10	Power strip	No								
10	Unplug chargers	No								
10	Low-flow showerhead	Yes								
10	Pipe insulation	Yes								
10	Water Heater Blanket	Yes								
11	Attic Insulation	Yes	R13	R49	105	1042	729	2.5		
11	Band Joint Insulation	Yes	R4	R19	23.1	187	131	2.4		
11	Basement Wall Insulation	Yes	R4	R11	187	910	637	1.5		
11	Clock thermostat	Yes								
11	Crawl Space Insulation	Yes	R6	R19	31.5	429	300.3	4		
11	Heating	Yes		1960						
11	Cooling	No		2006						
11	Water heating system	No		2002						
11	Duct Work	No								
11	Faucet Aerator	No								
11	Low-flow showerhead	No								
11	Pipe insulation	No								
11	Kitchen Faucet aerator	No								
11	Window caulking	No								
11	Reglaze windows	No								
11	Windows close tightly	No								
11	Window weatherstripping	No								
11	Window repair	No								
11	Door caulking	No								
11	Door weatherstripping	No								
11	Door repair	No								
11	Chimney infiltration	No								
11	Attic access infiltration	No								
11	Cantilever infiltration	No								
11	Seal wall corner infiltration	No								
11	Wall penetration	No								
11	Wall sill plate	No								
11	Refrigerator 1	No								
11	Refrigerator 2	No								
11	Freezer 1	No								
11	Freezer 2	No								
11	Television	No								
11	Clothes Washer	No								
11	Room air condition	No								
11	Install CFLs	No								
11	Occupancy sensors	No								
11	Power strip	No								
11	Unplug chargers	No								
11	Wall Insulation	Yes	R6	R11	352.1	2662.8	750	5.5		
11	Water Heater Blanket	Yes								
12	Band Joint Insulation	Yes	R38	R19		93	65.1	22.9		
12	Basement Wall Insulation	Yes	R49	R11		992	694.4	297.6		
12	Clock thermostat	Yes								
12	Heating	No		2000						

APPENDIX F: COMMERCIAL AUDITS

Business Type	Annual kWh Usage	Annual Therm Usage	EUI (Btuh/sq ft)	Project	Annual Savings	Implementation Cost	Simple Payback	Rebate	kWh Savings	Therm Savings
Restaurant	185940	3483	221535	Compact Fluorescent Lighting	\$813	\$156	0.2	\$104	9648	
Restaurant	185940	3483	221535	8' Fluorescent Lighting	\$35	\$595	17.1	\$70	412	
Restaurant	185940	3483	221535	4' Fluorescent Lighting	\$300	\$1,069	3.6	\$248	3559	
Restaurant	185940	3483	221535	Occupancy Sensors	\$4	\$120	29.4	\$40	48	
Restaurant	185940	3483	221535	Heating System	\$367	\$3,735	10.2			487
Restaurant	185940	3483	221535	Cooling System	\$78	\$1,958	25.1		926	
Recreation	73140	3304	56306	Compact Fluorescent Lighting	\$947	\$129	0.1	\$86	8606	
Recreation	73140	3304	56306	8' Fluorescent Lighting	\$78	\$1,700	19.1	\$200	713	
Recreation	73140	3304	56306	4' Fluorescent Lighting	\$894	\$4,730	4.4	\$816	8125	
Recreation	73140	3304	56306	Exit Sign Retrofit	\$133	\$80	0.2	\$50	1209	
Recreation	73140	3304	56306	Weather-stripping	\$94	\$45	0.1	\$32		121
Recreation	73140	3304	56306	Occupancy Sensors	\$27	\$120	3.0	\$40	161	
Recreation	73140	3304	56306	Water Heater Insulation	\$3	\$2	0.8			3
Hotel	189360	3841	71048	Compact Fluorescent Lighting	\$1,201	\$708	0.4	\$200	16022	
Hotel	189360	3841	71048	Fluorescent Lighting	\$536	\$1,592	2.4	\$332	7150	
Hotel	189360	3841	71048	Exit Sign Retrofit	\$99	\$208	0.8	\$130	1321	
Hotel	189360	3841	71048	Weather-stripping	\$36	\$90	0.8	\$63		56
Hotel	189360	3841	71048	PTAC Units	\$29	\$500	17.2		381	
Hotel	189360	3841	71048	Water Heaters	\$71	\$1,300	14.3	\$288		109
Hotel	189360	3841	71048	Snack/Refrigerated Beverage Controller	\$184	\$340	1.8		2453	
Office	20048	799	49435	Compact Fluorescent Lighting	\$6	\$9	0.5	\$6	65	
Office	20048	799	49435	4' Fluorescent Lighting	\$359	\$2,179	4.6	\$544	3972	
Office	20048	799	49435	Weather-stripping	\$75	\$15	0.1	\$11		85
Office	20048	799	49435	Heating System	\$98	\$1,613	13.9	\$250		112
Retail	23816	1625	27084	Window Replacement	\$502	\$12,766	25.4		2073	296
Retail	23816	1625	27084	8' Fluorescent Lighting	\$238	\$1,530	5.7	\$180	2280	
Retail	23816	1625	27084	4' Fluorescent Lighting	\$41	\$257	5.2	\$44	393	
Retail	23816	1625	27084	Weather-stripping	\$107	\$60	0.2	\$42		111
Office	307420	14446	129305	Compact Fluorescent Lighting	\$175	\$240	0.5	\$160	3587	
Office	307420	14446	129305	8' Fluorescent Lighting	\$9	\$176	15.1	\$40	191	
Office	307420	14446	129305	4' Fluorescent Lighting	\$2,114	\$20,686	7.5	\$4,852	43278	
Office	307420	14446	129305	Exit Sign Retrofit	\$59	\$80	1.2	\$10	1209	
Office	307420	14446	129305	Weather-stripping	\$56	\$30	0.2	\$21		77
Office	307420	14446	129305	Thermostat Setback	\$699	\$60,000	85.8		4560	655
Office	307420	14446	129305	Occupancy Sensors	\$18	\$600	22.2	\$200	361	
Office	307420	14446	129305	Radiant Heat	\$958	\$5,500	5.7			1319
Office	60538	1358	136492	Heating System	\$184	\$1,650	7.6	\$250		216
Office	61736	841	77077	Compact Fluorescent Lighting	\$25	\$9	0.1	\$6	300	
Office	61736	841	77077	8' Fluorescent Lighting	\$20	\$340	15.0	\$40	240	
Office	61736	841	77077	4' Fluorescent Lighting	\$476	\$2,772	4.3	\$704	5742	
Office	61736	841	77077	Water Heater Insulation	\$3	\$2	0.7			3
Office/Retail	24154	4770	65813	Ceiling/Roof Insulation	\$229	\$6,350	27.7		78	276
Office/Retail	24154	4770	65813	Compact Fluorescent Lighting	\$27	\$24	0.3	\$16	269	
Office/Retail	24154	4770	65813	8' Fluorescent Lighting	\$19	\$255	11.8	\$30	187	
Office/Retail	24154	4770	65813	4' Fluorescent Lighting	\$401	\$2,534	5.0	\$512	3964	
Office/Retail	24154	4770	65813	Exit Sign Retrofit	\$52	\$32	0.2	\$20	513	
Office/Retail	24154	4770	65813	Thermostat Setback	\$205		0.0			255
Office/Retail	24154	4770	65813	Water Heaters	\$19	\$600	27.6	\$75		600
Retail/Grocer	3775500	46703	302626	Door Heater Coolers	\$3,414	\$11,400	3.3		59829	
School	15040	1151	55032	Compact Fluorescent Lighting	\$21	\$12	0.2	\$8	168	
School	15040	1151	55032	8' Fluorescent Lighting	\$32	\$510	14.1	\$60	252	
School	15040	1151	55032	4' Fluorescent Lighting	\$187	\$1,008	4.0	\$256	1460	
School	15040	1151	55032	Heating System	\$132	\$1,500	9.5	\$250		161
Office	3305	157	3747	Window Shades/Quilts	\$44	\$930	21.1		1	30
Office	2605	249	12176	Window Shades/Quilts	\$38	\$930	24.5		1	34
Office	2605	249	12176	Thermostat Setback	\$23	\$0	0.0			21
Office	15733	684	121112	Compact Fluorescent Lighting	\$31	\$9	0.1	\$6	324	
Office	15733	684	121112	4' Fluorescent Lighting	\$146	\$819	4.2	\$208	1525	
Office	15733	684	121112	Thermostat Setback	\$40		0.0			46
Office	15733	684	121112	Heating System	\$140	\$5,300	36.8	\$150		159
Office	15733	684	121112	Cooling System	\$89	\$700	7.8	\$10	926	
Office	15784	437	97555	4' Fluorescent Lighting	\$131	\$693	3.9	\$176	1436	
Office	15784	437	97555	Heating System	\$55	\$1,400	20.9	\$250		58
Office	15784	437	97555	Cooling System	\$56	\$1,750	31.1	\$10	617	
Office	32015	1826	62093	8' Fluorescent Lighting	\$32	\$2,975	82.0	\$350	366	
Office	32015	1826	62093	4' Fluorescent Lighting	\$217	\$2,742	9.7	\$640	2478	
Office	32015	1826	62093	Thermostat Setback	\$226		0.0			
Office	32015	1826	62093	Heating System	\$127	\$3,000	22.8	\$100	842	66
Restaurant	133680	2640	275063	Ceiling/Roof Insulation	\$210	\$3,089	14.7		118	249
Restaurant	133680	2640	275063	Weather-stripping	\$148	\$30	0.1	\$21		183
Restaurant	133680	2640	275063	Heating System	\$258	\$3,608	13.0	\$250		320
Office	16793	467	31137	4' Fluorescent Lighting	\$191	\$1,260	4.9	\$320	2086	
Office	16793	467	31137	Thermostat Setback	\$184		0.0		1493	50
Salon	12035	559	90451	Compact Fluorescent Lighting	\$89	\$21	0.1	\$14	974	
Salon	12035	559	90451	4' Fluorescent Lighting	\$20	\$113	4.5	\$24	223	
Salon	12035	559	90451	Heating System	\$88	\$5,400	59.7	\$150		75

Salon	12035	559	90451 Water Heater Insulation	\$29	\$51	1.8			25
Restaurant	158320	3970	312396 Window Shades/Quilts	\$803	\$30,099	37.5		7	1018
Restaurant	158320	3970	312396 Compact Fluorescent Lighting	\$102	\$15	0.0	\$10	1325	
Restaurant	158320	3970	312396 8' Fluorescent Lighting	\$6	\$85	12.5	\$10	73	
Restaurant	158320	3970	312396 4' Fluorescent Lighting	\$680	\$1,764	1.9	\$448	8834	
Restaurant	158320	3970	312396 Exit Sign Retrofit	\$19	\$16	0.3	\$10	242	
Restaurant	158320	3970	312396 Weather-stripping	\$56	\$30	0.2	\$21		71
Restaurant	158320	3970	312396 Thermostat Setback	\$78		0.0		480	52
Restaurant	158320	3970	312396 Occupancy Sensors	\$387	\$120	0.2	\$40	491	
Restaurant	158320	3970	312396 Heating System	\$141	\$1,600	9.6	\$250		179
Restaurant	158320	3970	312396 Water Heaters	\$137	\$1,450	10.0	\$75		174
Office	116225	603	29743 Exit Sign Retrofit	\$53	\$160	1.1	\$100	578	
Office	116225	603	29743 Thermostat Setback	\$45	\$0	0.0			48
Office	116225	603	29743 Occupancy Sensors	\$65	\$240	2.5	\$80	711	
Residential	1514304	27206	295985 Compact Fluorescent Lighting	\$1,511	\$75	0.0	\$50	19651	
Residential	1514304	27206	295985 4' Fluorescent Lighting	\$3,949	\$12,240	2.3	\$3,168	51363	
Residential	1514304	27206	295985 Occupancy Sensors	\$35	\$120	2.3	\$40	457	
Worship	40400	6591	50420 Compact Fluorescent Lighting	\$78	\$150	0.6	\$100	917	
Worship	40400	6591	50420 8' Fluorescent Lighting	\$81	\$5,355	50.6	\$1,260	950	
Worship	40400	6591	50420 4' Fluorescent Lighting	\$179	\$6,088	26.6	\$1,321	2101	
Worship	40400	6591	50420 Exit Sign Retrofit	\$41	\$32	0.3	\$20	484	
Worship	40400	6591	50420 Weather-stripping	\$116	\$15	0.0	\$11		158
Worship	40400	6591	50420 Thermostat Setback	\$139	\$650	2.9	\$250	863	89
Worship	40400	6591	50420 Heating System	\$83	\$2,200	22.6	\$325		113
Worship	40400	6591	50420 Cooling System	\$381	\$8,800	22.3	\$300	4472	
Residential	672960	15797	193540 4' Fluorescent Lighting	\$1,535	\$5,800	3.2	\$928	19892	
Residential	672960	15797	193540 Heating System	\$850	\$33,465	36.7	\$2,310		1233
Office	45504	130	177155 Ceiling/Roof Insulation	\$42	\$1,017	20.6	\$152	24	38
Office	45504	130	177155 8' Fluorescent Lighting	\$11	\$85	6.8	\$10	131	
Office	45504	130	177155 Occupancy Sensors	\$34	\$60	1.2	\$20	413	
Office	45504	130	177155 Cooling System	\$51	\$1,750	32.4	\$100	617	
Residential	83531	1162	9284 4' Fluorescent Lighting	\$605	\$2,826	4.1	\$320	6693	
Residential	83531	1162	9284 Heating System	\$80	\$1,550	19.4			78
Residential	83531	1162	9284 Weather-stripping	\$168	\$120	0.2	\$84		162
Residential	83531	1162	9284 Water Heater Insulation	\$11	\$8	0.7			10
Residential	9825	381	12017 4' Fluorescent Lighting	\$90	\$300	3.1	\$24	841	
Residential	9825	381	12017 Exit Sign Retrofit	\$207	\$128	0.6	\$10	1934	
Residential	9825	381	12017 Water Heater Insulation	\$3	\$2	0.7			3
Office	6659	595	49234 Compact Fluorescent Lighting	\$5	\$12	0.8	\$8	51	
Office	6659	595	49234 4' Fluorescent Lighting	\$148	\$1,134	5.7	\$288	1404	
Office	6659	595	49234 Thermostat Setback	\$99	\$130	0.8	\$50	483	52
Restaurant	141200	60941	33057 Compact Fluorescent Lighting	\$535	\$87	0.1	\$58	6970	
Restaurant	141200	60941	33057 4' Fluorescent Lighting	\$28	\$126	3.4	\$32	372	
Restaurant	141200	60941	33057 Exit Sign Retrofit	\$37	\$32	0.3	\$20	484	
Restaurant	141200	60941	33057 Weather-stripping	\$80	\$30	0.1	\$21		110
Service	3163	356	23196 Compact Fluorescent Lighting	\$22	\$6	0.1	\$4	156	
Service	3163	356	23196 4' Fluorescent Lighting	\$45	\$289	5.0	\$64	322	
Service	3163	356	23196 Heating System	\$65	\$1,538	19.8	\$250		63
Service	3163	356	23196 Cooling System	\$121	\$1,013	7.5	\$100	860	
Retail	1386	825	48461 Window Replacement	\$104	\$4,482	43.1		90	72
Retail	1386	825	48461 Compact Fluorescent Lighting	\$231	\$18	0.0	\$12	642	
Retail	1386	825	48461 8' Fluorescent Lighting	\$74	\$264	2.8	\$60	205	
Retail	1386	825	48461 4' Fluorescent Lighting	\$151	\$310	1.7	\$52	419	
Retail	1386	825	48461 Thermostat Setback	\$96	\$65	0.4	\$25	0	96
Retail	1386	825	48461 Heating System	\$203	\$2,500	11.1	\$250		204
Restaurant	84520	6602	322209 4' Fluorescent Lighting	\$66	\$376	4.6	\$72	814	
Restaurant	84520	6602	322209 Thermostat Setback	\$216	\$65	0.2	\$25	1240	155
Office	515280	24968	431973 Exit Sign Retrofit	\$387	\$352	0.3	\$220	5319	
Office	515280	24968	431973 Weather-stripping	\$101	\$60	0.2	\$42		153
Office	515280	24968	431973 Heating System	\$2,057	\$39,000	17.5	\$2,976		3111
Office	515280	24968	431973 Water Heater Insulation	\$4	\$4	1.0			6
Office	515280	24968	431973 Water Heaters	\$194	\$3,375	17.0	\$75		293
Residential	532160	6864	79961 Window Shades/Quilts	\$1,649	\$46,200	28.0		101	2433
Residential	532160	6864	79961 Compact Fluorescent Lighting	\$1,683	\$1,008	0.5	\$100	23965	
Residential	532160	6864	79961 Occupancy Sensors	\$26	\$300	7.7	\$100	71	
Residential	532160	6864	79961 Water Heaters	\$366	\$3,000	8.2			539
Residential	532160	6864	79961 Low Flow Kitchen Sprayers	\$19	\$75	3.9		5040	29
Residential	532160	6864	79961 Energy Star Washing Machines	\$125	\$3,000	20.8	\$400	307	153
Office	576960	20072	232638 Metal Halide Lighting	\$84	\$273	2.9	\$26	1084	
Office	576960	20072	232638 Exit Sign Retrofit	\$301	\$256	0.3	\$160	3868	
Office	576960	20072	232638 Weather-stripping	\$82	\$15	0.0	\$11		155
Office	576960	20072	232638 Occupancy Sensors	\$45	\$480	7.1	\$160	574	
Office	576960	20072	232638 Heating System	\$2,555	\$51,820	18.5	\$4,676		4284