

## 2.9 PLANNING ISSUES – SUSTAINABILITY AND ENERGY

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### Objectives:

1. To create an enduring future that promotes quality of life, financial prosperity and innovative ideas and technologies while respecting and protecting natural resources.
2. To be a leader and role model in the area of energy conservation, energy efficiency, reduction of greenhouse gas emissions and use of renewable resources within Kane County and throughout the region.
3. To foster public awareness, education and support of sustainable practices through the development of livable communities.
4. To promote energy conservation and sustainable development practices in County and municipal health, transportation and land use planning for the three strategy areas.
5. To promote economic development and workforce trained in the energy efficiency and renewable energy industry.
6. To promote mitigation and adaptation to climate change that addresses public health and safety, infrastructure, economic and environmental issues.
7. To facilitate the siting of smart grid technology and renewable energy infrastructure designed to increase energy efficiency and reliability.
8. To support a multi-modal transportation system that decreases reliance on fossil fuels.

### Chapter Focus

An increasing number of local, regional governments and organizations are addressing the issue of sustainability through their planning and policy processes. In acknowledgement of this trend, sustainability is partnered with energy as a new planning issue in the 2040 Plan.

Decisions regarding consumption of natural resources for energy production and other uses have consequences that affect our environment. The quality of the air and water available now and into the future has a direct effect on the quality of life of our communities and the health of our residents.

Kane County began investigating energy use and conservation activities in 2005 when staff participated in the development of the Kane County Energy Plan, a document which contains information about energy use; transmission and production facilities and future needs; and recommended conservation strategies. The Kane County Energy Plan, the 2030 Land Resource Management Plan as well as the Kane County Energy Efficiency and Conservation Strategy developed in 2009 set the stage for expanded energy initiatives in the County.

**Great Law of the Iroquois**  
*In every deliberation we must consider the impact on the seventh generation.*

The objectives and policies of the Sustainability and Energy chapter promote land use patterns and strategies that decrease energy consumption.

This chapter examines:

- Energy and Sustainability in the Region
- Energy and Sustainability in Kane County
- Sustainability, Energy and Land Use Decisions

## Energy and Sustainability in the Region

The concept of sustainability contains three elements, *society, the environment, and the economy*, that play an important role in the development of healthy communities (Figure 68). Kane County has a long history of recognizing the value our natural resources offer in providing vital goods and services and the importance of preserving and maintaining our ecosystems and environment. Society embeds that value in its land use and economic policy decisions. In order to meet the goals of healthy people, healthy living and healthy communities, Kane County must strive to achieve a balance between the elements of *society, the environment and the economy*.

Sustainability is commonly defined as ***the ability to meet the needs of the present without compromising the capability of future generations to meet their own needs***. The issue of sustainability and its elements of *society, the environment and the economy* cross jurisdictional borders. Therefore, it makes sense to plan for sustainability on a regional level while encouraging and coordinating with local implementation efforts to achieve our common goals.

Figure 68



The Chicago Metropolitan Agency for Planning encourages sustainability in the GO TO 2040 Plan:

- in terms of prosperity by seeking “to maintain and strengthen our region’s position as one of the nation’s few global economic centers;”
- by linking “transit, housing and energy use through livable communities;”
- by encouraging communities to promote renewable energy generation; use green materials; and commit to waste reduction and recycling;
- by promoting sustainable local food;
- by mitigating climate change through energy conservation, urban tree planting and open space preservation; and
- by encouraging local governments to be early adopters of sustainable practices.<sup>1</sup>

Another regional organization, Chicago Wilderness, an alliance (Figure 69) of more than 250 organizations is striving to protect natural resources through four strategic initiatives:

1. restoring the health of local nature;
2. promoting a green infrastructure;
3. combating climate change; and
4. leaving no child inside

“Millions of dollars in ecosystem benefits are lost every year to poorly planned growth.”<sup>2</sup> Chicago Wilderness addresses the impacts to our environment that affect society’s quality of life. Based on the organization’s 2008 paper, “Climate Change and Regional Biodiversity” which assessed scientific studies that forecast local impacts due to climate change, the Climate Action Plan for Nature (CAPN) was developed. “The three main strategies of the Climate Action Plan for Nature encourage the Chicago Wilderness alliance to:

1. mitigate the future impacts of climate change;
2. adapt to those that are inevitable; and
3. engage the Chicago Wilderness community in action.”<sup>3</sup>

The CAPN integrates Chicago Wilderness’ four strategic initiatives while working with the region’s member organizations to develop local solutions that have a global impact.

**Figure 69**



**Chicago Wilderness planning area**

<sup>1</sup> Chicago Metropolitan Agency for Planning. 2010. GO TO 2040 Plan.

<sup>2</sup> Chicago Wilderness, [chicagowilderness.org](http://chicagowilderness.org)

<sup>3</sup> Chicago Wilderness 2011. Climate Action Plan for Nature

## Energy and Sustainability in Kane County

Our society consumes energy primarily for transportation; heating and cooling of buildings; and to power lighting, appliances, etc. Energy is also needed to treat and distribute clean water. Energy costs are rising and are expected to do so for the foreseeable future.<sup>4</sup> Increasing energy costs and changing energy needs raise economic, environmental and social concerns that impact municipalities, businesses and households.

In 2009, Kane County was awarded an Energy Efficiency and Conservation Block Grant from the U.S. Department of Energy as a component of the American Recovery and Reinvestment Act. The required Energy Efficiency and Conservation Strategy approved by the County Board, includes nine activities aimed at improving energy efficiency, reducing fossil fuel emissions, decreasing overall energy consumption, and improving energy efficiency in the transportation, building and other energy consuming sectors. The following activities in the Kane County Energy and Efficiency and Conservation Strategy address energy efficiency, fossil fuel emissions, and overall energy consumption:

1. **Update Kane County Energy Plan and Energy Efficiency Documents** – Produce a five-year update to the Kane County Energy Plan. The update includes formulation of energy efficiency, energy conservation and energy usage statistics; and goals and identification of strategies to achieve those goals. Coordinate the data, goals and objectives of the Kane County Energy Plan and Kane County's 2040 Plan. Collect data about Kane County facilities, equipment, and operations in support of a Kane County Operational Sustainability Plan.
2. **Kane County Facility Audits** – Conduct audits of five or more Kane County facilities and create a list of priority energy efficiency improvement projects.
3. **Kane County Facility Efficiency Improvements** – Implement cost-effective energy efficiency measures in county-owned buildings and facilities.
4. **Revolving Loan Fund for Public Sector and Nonprofit Energy Efficiency Improvement Projects** – Establish a Revolving Loan Fund to encourage public sector and nonprofit energy efficiency facility improvements. In 2011 this activity was cancelled due to lack of interest.
5. **Sustainable Building Training Program for Builders and Building Trades** – Coordinate with Aurora and Elgin to establish a regional training program to promote sustainable, energy efficient building techniques and offered at reduced rates to builders and contractors located in Kane County.
6. **Improvements to Kane County Division of Transportation (KDOT) Intelligent Transportation System (ITS)** – Implement improvements to Kane

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<sup>4</sup> "The Chicago Region Greenhouse Gas Baseline Inventory and Forecast." 2009 December. Prepared for the Chicago Metropolitan Agency for Planning.

County's ITS, including the expansion of the Fiber Optic Interconnect Network from County highway and road segments to aid in real time management for traffic and maintenance operations and the modernization of traffic signal and communication systems for integration into the County's ITS network.

7. **Transportation Long Range Comprehensive Plan and Randall/Orchard Rd. BRT Study** – As part of the Long Range Comprehensive Planning Process carry out a study to determine the extent to which bus rapid transit, improved transit, and corridor densification will reduce the need for additional transportation infrastructure improvements and reduce vehicle miles traveled, improving the efficiency of Kane County's transportation network.
8. **Improvements to Methane Capture and Power Generation Facilities** – Pursue feasibility and agreements for implementation of the development of additional methane capture and power generation facilities at Kane County landfill facilities. Due to lack of feasibility this activity was cancelled.
9. **Neighborhood Stabilization Program – Energy Efficiency Retrofits** – Include additional energy efficiency measures in retrofits of foreclosed homes as part of Kane County's Neighborhood Stabilization Program.

**Figure 70**

**In 2009, the City of Aurora adopted “The City of Aurora Sustainability Plan, a Long-Range Plan for Enhancing the Quality of Life for Present and Future Generations Through Sustainable Practices” with goals categorized within six focus areas:**

1. Community Development and Land Use
2. Transportation and Infrastructure
3. Energy Efficiency and Green Buildings
4. Waste and Food Residuals
5. Water Quality and Conservation
6. Education and engagement

### **Kane County 2040 Energy Plan**

The Kane County 2040 Energy Plan adopted by the County Board in 2011 recognizes land use planning as an effective technique to conserve limited energy resources as promoted in the 2020 Land Resource Management Plan. The 2030 Land Resource Management Plan expanded the energy discussion to include setting standards for green buildings and reducing dependence on the automobile through effective land use planning and the Smart Growth Principles.

*The International Energy Agency estimates that an additional \$1 spent on efficiency improvements avoids \$2 in investment in electricity supply.*

Since the adoption of the 2030 Plan our society and the world has increased its focus on the generation and consumption of energy. Recognition of fossil fuels as a finite, polluting, and increasingly costly source of energy has resulted in efforts directed toward conservation and the use of renewable sources of energy. The 2040 Energy Plan is the next logical step to specifically address these issues in Kane County. CNT Energy, a division of the Center for Neighborhood Technology and a creative think-and-do tank that provides energy-related research and solutions to consumers and communities, collaborated with Kane County to develop the 2040 Energy Plan.

The 2040 Energy Plan illustrates the importance of understanding energy issues by providing basic facts about electricity and natural gas consumption as well as the types of energy available to Kane County: fossil fuel, nuclear power, and renewable. The connection between energy, emissions and climate change and the increasing generation and consumption of renewable energy is explained.

Renewable energy accounted for 8% of total energy consumption in the United States during 2009, up from 6% in 2004.<sup>5</sup> The Illinois Renewable Energy Standard adopted in 2007 set annual incremental percentage goals for electricity production from renewable sources culminating in 25% renewable sources by 2025.<sup>6</sup>

In the United States, buildings account for approximately 39% of total energy use; 72% of electricity consumption; and 38% of carbon dioxide emissions (U.S. Green Building Council, 2009). The energy used in Kane County's buildings is from electricity (ComEd, and Batavia, Geneva and St. Charles municipal utilities) and natural gas (Nicor utility). Other heating fuel sources such as propane, fuel oil, wood, geothermal and solar currently comprise less than 3% of the energy used in the County.<sup>7</sup>

The bulk of the Energy Plan focuses on consumption of electricity and natural gas in the residential, and commercial and industrial sectors of Kane County and strategies for reducing consumption over the next thirty years. Table 10 indicates the baseline energy consumption in 2008 including data from ComEd, and the municipal utilities of Batavia,

According to the U.S. Environmental Protection Agency, "the Earth's climate has changed many times during the planet's history, with events ranging from ice ages to long periods of warmth. Historically, natural factors such as volcanic eruptions, changes in the earth's orbit, and the amount of energy released by the sun have affected the Earth's climate. Beginning late in the 18<sup>th</sup> century, human activities associated with the Industrial Revolution have also changed the composition of the atmosphere and therefore very likely are influencing the Earth's climate."

<sup>5</sup> U.S. Energy Information Administration. 2011. [www.eia.gov](http://www.eia.gov).

<sup>6</sup> Illinois Commerce Commission. 6 April 2011. <http://www.icc.illinois.gov/>.

<sup>7</sup> American Community Survey. Kane County, 2006-2008. United States Census Bureau. 5 April 2011. [http://factfinder.census.gov/home/saff/main.html?\\_lang=en](http://factfinder.census.gov/home/saff/main.html?_lang=en).

Geneva and St. Charles. Figure 73 graphically shows Kane County’s residential electricity consumption.

**Table 10**

Sector	Electricity	Natural Gas
<b>Residential</b>	1,617,248,849 kWh	181,639,334 therms
<b>Commercial/Industrial</b>	3,253,629,099 kWh	158,437,043 therms
<b>Total</b>	<b>4,870,877,948 kWh</b>	<b>340,076,377 therms</b>

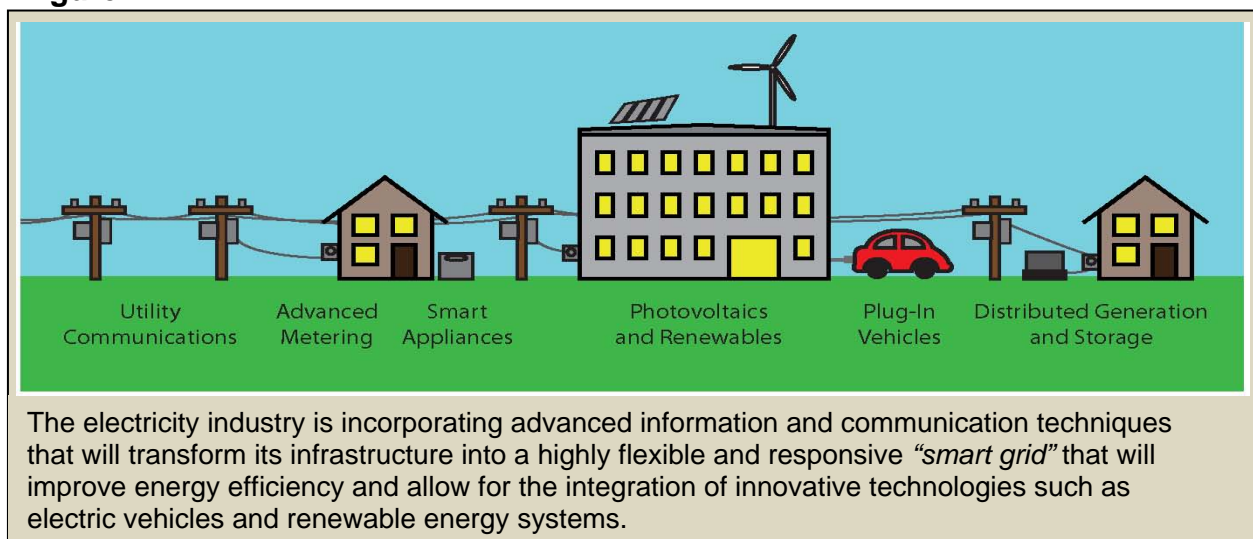
Average consumption per household or account and for each municipality is also available in the Plan. Information and key concepts assist readers in understanding the data.

Current trends show that electricity consumption is on the rise nationwide. In the residential sector, this is attributed to growth in consumer electronics and information technology equipment as well as increases in home size and air conditioning use. In the commercial and industrial sector, increasing consumption is driven by telecommunication and network equipment; along with specialized technologies such as medical imaging advancements.<sup>8</sup>

**Figure 71**

*Peak demand* describes a period of time when electricity usage is highest. Often in Illinois, the highest system peak demands occur on hot summer afternoons when the demand for electricity is high due to air conditioning use. Strategies that reduce system peak demand can reduce the utility’s need to operate and build additional infrastructure and decrease the strain on the electrical grid.

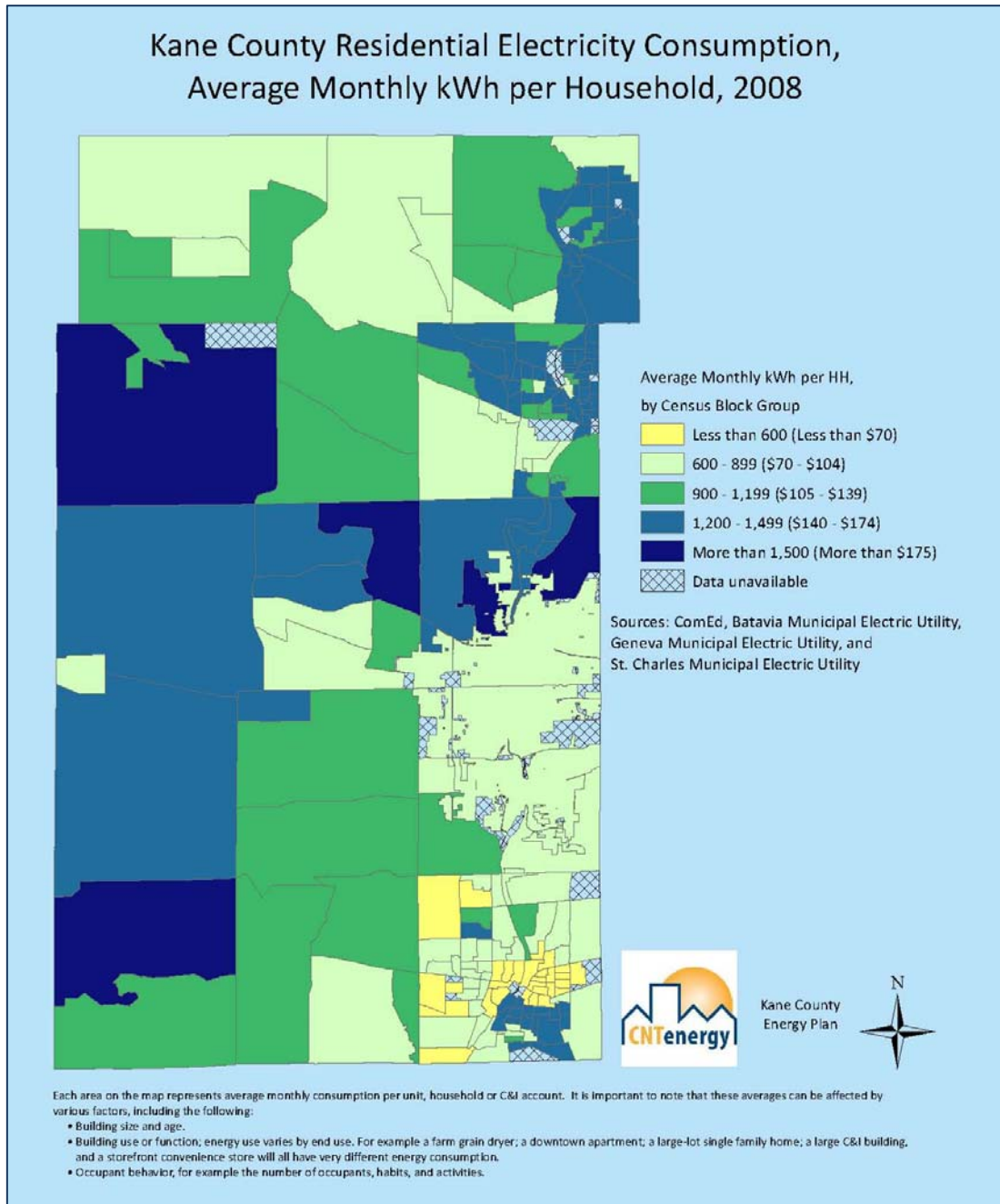
**Figure 72**



<sup>8</sup> “Miscellaneous Electricity Services in the Building Sector.” Annual Energy Outlook. 2007. Energy Information Administration. 5 April 2011. <http://www.eia.doe.gov/oiaf/aeo/otheranalysis/mesbs.html>.

In northern Illinois, natural gas is the primary fuel used for space heating. In addition, natural gas is commonly used for hot water heaters, clothes dryers and cooking. However, consumption is slowly decreasing due to increased energy efficiency in both homes and businesses and because of de-industrialization in the commercial and industrial sector.<sup>9</sup>

**Figure 73**



<sup>9</sup> “Chicago Regional Energy Snapshot.” 2009 September. Prepared for the Chicago Metropolitan Agency for Planning. 5 April 2011. <http://www.cmap.illinois.gov/strategy-papers/regional-energy>.



There are a variety of strategies available to increase energy efficiency. The ideas represented in the 2040 Energy Plan include the most common energy-saving strategies employed by communities across the country for both residential, and commercial and industrial sectors. Table 11 lists the strategies identified.

**Table 11**

<b>Residential Strategies</b>	
1	Retrofit existing residential buildings
2	Develop green building standards and programs for new residential construction
3	Encourage on-site renewable energy for residential buildings
4	Encourage occupant behavior modification in the residential sector
5	Encourage energy efficiency window air conditioner replacement
6	Encourage energy efficient refrigerator replacement
<b>Commercial and Industrial Strategies</b>	
7	Retrofit existing commercial and industrial buildings
8	Develop green building standards and programs for new construction
9	Encourage on-site renewable energy for commercial and industrial buildings
10	Encourage occupant behavior modification in the commercial and industrial sector

**Figure 74**

- Municipal Utility Strategies:*
1. *Batavia e-mails residents reminders of peak consumption times.*
  2. *Geneva purchases power generated from a local landfill.*
  3. *St. Charles residents have the option to purchase renewable energy certificates.*

Each strategy was analyzed for potential energy and cost savings on a household or account basis and countywide impact. In order to address the distinct vision of each community, three scenarios, conservative, moderate and aggressive, were developed for each strategy. Based on the three scenarios it is estimated that Kane County could save \$1 billion to \$3.4 billion over the next 30 years. Designed by the Minnesota Power Company, “the Pyramid of

Conservation is designed to help you prioritize steps and develop an action plan that's

right for you. By establishing a foundation in energy efficiency and gaining a better understanding about how you use energy, you can more effectively work your way up the pyramid.”<sup>10</sup> (Figure 75).

**Figure 75**<sup>10a</sup>



### Kane County Sustainability Plan

On a broader scale, the Kane County Sustainability Plan is currently being developed. The Plan includes three phases:

1. Kane County Government Facilities and Operations
2. Kane County Policies and Actions
3. Kane County/Municipal/District Collaboration

During Phase 1 representatives from Kane County Government departments have been instrumental in reviewing current interdepartmental practices related to operations, facilities, equipment, purchasing, and office habits in order to develop more sustainable policies and activities. An energy, water and material use, and greenhouse gas emissions study will be conducted to provide baseline measurement against which to measure future Phase 1 sustainability plan implementation success. Phase 2 will expand the focus of sustainability to the unincorporated areas of Kane County. This next phase will examine the sustainability of Kane County’s policies and programs,

<sup>10</sup> Minnesota Power. [www.mnpower.com](http://www.mnpower.com)

which affect unincorporated Kane County. Phase 3 will focus on the collaboration and support between Kane County government, the municipalities, townships, and districts. Sustainability initiatives are currently being implemented in some municipalities and jurisdictions. All three phases will incorporate the elements of *environment, society, and economy*.

As Kane County moves forward with planning and implementation of sustainability and energy initiatives, collaboration will be a key component. Cooperation and sharing of resources across the region benefits all and increases funding and technical assistance opportunities.

**Figure 76**

The City of Elgin chose a community focused approach to sustainability. Interested citizens formed a Sustainability Advisory Team consisting of nine working groups, each focused on a particular topic. The groups' recommended sustainable practices became part of *The Elgin Sustainability Action Plan* with the overall mission *"To improve the quality of life for Elgin citizens and improve its local environment, while making Elgin a more viable and vibrant place to live."*

## **Sustainability, Energy and Land Use Decisions**

Land use decisions also play an important role in mobility choices that translate into vehicle miles travelled, traffic congestion and emissions. The Kane County 2040 Plan emphasizes the importance of creating livable communities with compact, mixed-use, multi-modal development that results in healthier people, healthier living and healthier communities.

In the Chicago region, 27% of all emissions are from energy consumption by on-road transportation.<sup>11</sup> Due to existing land use patterns most trips in Kane County are by automobile. Projected increase in congestion over the next three decades will contribute to additional costs; time spent in traffic; and greenhouse gas emissions. Reaffirmed by the 2040 Plan, the 2030 Land Resource Management Plan identified traffic congestion as one of three challenges and emphasized the need to **reduce traffic congestion, provide transportation options, and improve air quality**. Multiple transportation options are available in the more urban areas of Kane County. The use of public transportation, where available, walking, biking, car sharing, and the increased use of fuel-efficient and alternative fuel vehicles has slowed the increase of congestion and greenhouse gas emissions.

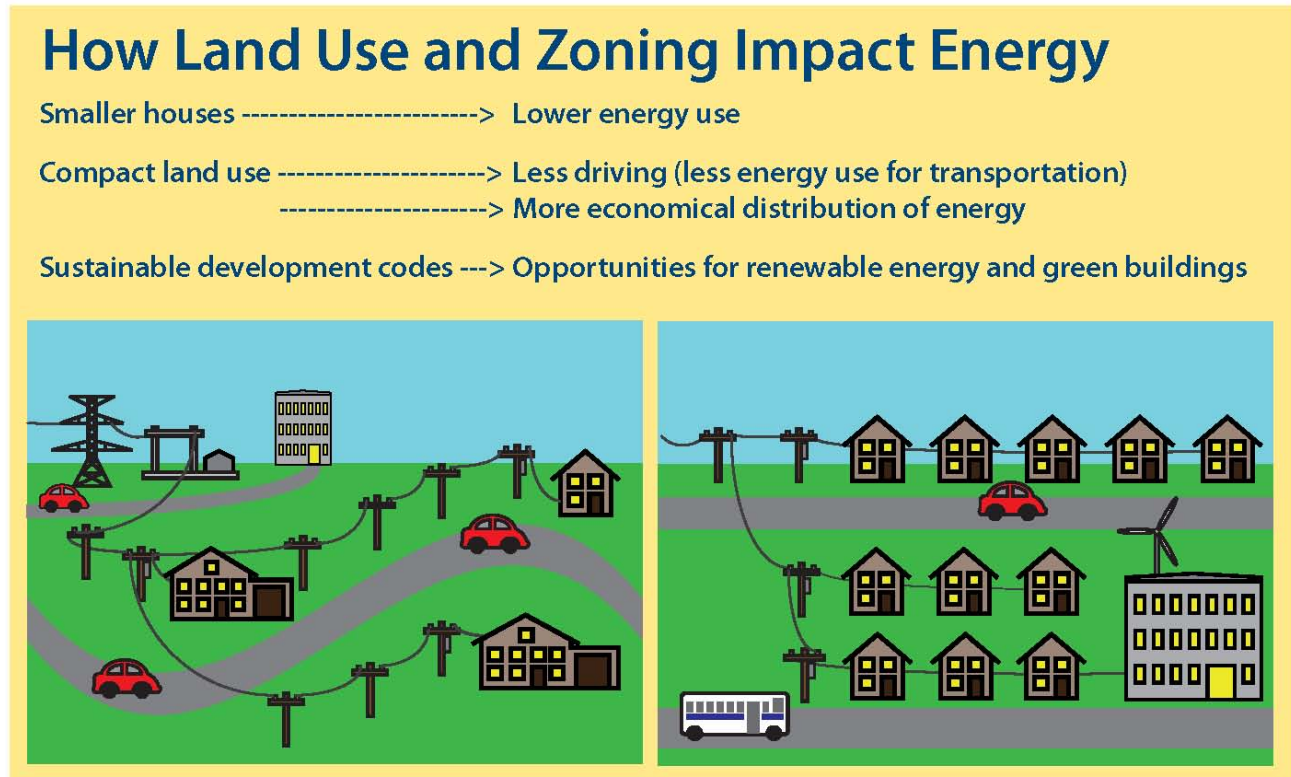
One strategy detailed in the 2040 Plan is the Randall/Orchard Rd. BRT Study which will determine the feasibility of bus rapid transit (BRT), improved transit and land use modifications. If implemented, BRT could reduce travel times; combat congestion, while improving air quality, increase land values and create jobs.

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<sup>11</sup> Center for Neighborhood Technology, included in the GO TO 2040 Plan, page 101.

In order to promote clean, renewable energy as well as mitigate and adapt to climate change, Kane County must integrate land use, energy use, and transportation infrastructure. Compact, mixed-use development, multi-modal transportation opportunities, and planting shade trees are examples of strategies to reduce energy demand. Siting of buildings, green building standards and retrofits can increase energy efficiency (Figure 77).

**Figure 77**



## Chapter Policies

1. Partner with CMAP, local government agencies, utility companies and the private sector to develop and implement sustainable strategies that create livable communities and promote a healthy quality of life.
2. Coordinate with the residential, commercial and industrial sectors to reduce energy consumption through energy efficiency measures.
3. Promote energy and resource efficiency in the design, construction and siting of new buildings while supporting energy-saving innovations in existing buildings.
4. Reduce energy and resource consumption by at least 10% in county-owned buildings based on the opportunities indicated in each building's energy audit reports through technological and occupant behavior improvements.
5. Promote small and utility scale renewable energy generation.
6. Provide infrastructure to accommodate and encourage the use of alternative fuel vehicles.
7. Enhance opportunities for innovation, economic development and a workforce trained in the energy efficiency and renewable energy industries.
8. Educate the community about the vulnerabilities that may result from changes in climate and available mitigation and adaptation strategies.
9. Work with local and regional electric utility companies to develop strategies that decrease peak demand and the need for additional infrastructure.
10. Coordinate with local government and non-government organizations to plant trees in urban areas to decrease urban heat island effect and increase carbon sequestration.
11. Promote land use patterns that decrease vehicle miles travelled resulting in fewer greenhouse gas emissions and less need for infrastructure.

