J. SUSTAINABILITY GOALS

The City of Madison has become a leader in advancing the principles of sustainability (defined as meeting today's needs without compromising the ability of future generations to meet their own needs). A sustainable development is a development whose patterns of production and consumption can be reproduced indefinitely without doing irreparable damage to essential natural ecosystems. Sustainable development is achieved by bringing environmental, economic and social equity into balance.

In 2004, the City adopted *Building a Green Capital City-A Blueprint for Madison's Sustainable Design and Energy Future.* One of the recommendations of the report was to adopt a guiding principle on sustainability. In 2005, the City adopted *The Natural Step Model for Communities* as the guiding framework on sustainability. Using this framework, the City aspires to be an ecologically, economically and socially healthy community for the long-term. The Natural Step (TNS) is based upon four "system conditions" or "sustainability principles" (SP) which are outlined below:

In a sustainable society, Nature is not subject to systematically increasing….;

SP 1 ….concentrations of substances extracted from the Earth's crust—fossil fuels, heavy metals and minerals

SP 2. ….concentrations of man-made substances –chemicals and un-natural products

SP 3. ….degradation by physical means—deforestation, land, air and water pollution,

In that sustainable society:

SP 4…..people are not subject to conditions that systematically undermine their capacity to meet their needs.

The TNS framework is used to guide many City processes. Each year the City solicits recommendations from staff for an annual "top ten" list of projects that would enhance the sustainability of the City's functions. The TNS projects are then implemented throughout the year with progress reports shared at monthly TNS project team meetings. A particularly relevant example, the rewriting of the City's zoning code is an important TNS project that has identified many sustainable development aspects of land use decisions (open space, limits on impervious surfaces, mixed use and transit-oriented development, walk ability, renewable energy, etc); the new code will be in place as development occurs in the Northeast Neighborhoods.

The planning process for the Northeast Neighborhoods became one of the City's TNS projects for 2009, when the City recognized the area offered a tremendous opportunity to implement its sustainability objectives. During the planning process, it was decided to pursue quantifiable sustainability goals for future development within the planning area. On March 31, 2009, the Common Council adopted a resolution with the following five sustainability goals:

1. Reduce dependence on the automobile
2. Reduce energy consumption
3. Reduce water consumption
4. Increase on-site stormwater infiltration
5. Deliver City services in an energy efficient manner

These goals guided preparation of the *Northeast Neighborhoods Development Plan* and the *Plan* is intended to serve as a guide for achieving these goals. Background information regarding each goal is provided below. Recommendations and implementation steps to achieve the goals are also provided later in this document.

1. Reduce Dependence on the Automobile

a) The Goal

Capturing 25% of all trips made by persons living in the development area by walking, bicycling or transit and/or reducing household motor vehicle miles of travel (VMT) by 25% (in comparison to a baseline to be determined by staff) through the use of transit-oriented development, traditional neighborhood development, mixed-use

development, transit access for early neighborhood residents, transportation-demand management plans, walkable environments, bike facilities, or other transportation-demand management practices.

b) Sustainability Benefits of the Goal

Addresses sustainability principles 1 through 4 by reducing dependency on fossil fuel consumption (#1) that increases air pollution, water pollution and degradation of land at the oil, natural gas and coal production site and within the neighborhood plan area (#3). Heavy metals (#1) and man-made material consumption (#2) will also be reduced and quality of life for residents will be enhanced. (#4)

c) Background Information/Baseline

Household Trip Reduction

According to a survey completed in 2001 as part of the National Household Travel Survey, the modal split for travel by City of Madison residents was as follows:

- Automobile: 80.3%
- Walk: 13.5%
- Bicycle: 2.4%
- Bus: 1.9%
- School Bus: 0.7%
- Inter-city Bus: 0.2%
- Other (air, taxi, etc.): 0.9%

The goal for the planning area is to have walking, biking or transit account for at least 25% of all trips made by residents of the planning area. Transit includes the bus, school bus and intercity bus categories above, plus potential rail options.

Household Vehicle Miles Traveled (VMT) Reduction

It is also desirable to .reduce household vehicle miles traveled by 25%, in comparison to a baseline, for the planning area. At this time, the data collection and monitoring methods for household VMT (or VMT per capita) are under development. A specific measurement and monitoring program will be developed as VMT data collection technologies and techniques are refined over time.

2. Reduce Energy Consumption

a) The Goal

Reducing household consumption of natural gas and fossil fuel-generated electricity by 25% compared to a baseline reflecting recent residential construction, which will be established and included in the Northeast Neighborhoods Development Plan. Progress towards attaining these goals will be through the use of energy efficient construction, alternative energy sources, on-site energy production, conservation education and outreach, or other energy conservation practices.

b) Sustainability Benefits of the Goal

Addresses sustainability principles 1 through 4 by reducing dependency on fossil fuel consumption in electrical power generation (#1), that increases air pollution, water pollution and degradation of land at the oil, natural gas and coal production site (#3) and within the neighborhood plan area. Heavy metals (#1) and man-made material (#2) disposal issues will also be reduced and quality of life for residents will be enhanced (#4) by having greater energy efficiency that increases comfort at home and work.

c) Background Information/Baseline

The baseline for this goal is a 25% reduction in energy use compared to "recent residential construction." Recent residential construction is defined as a dwelling unit built within the City between January 1, 2000 and December 31, 2008. Newer dwelling units are used for the baseline since they typically include improvements in energy efficiency not found in older units.

According to records obtained through the City Assessor's Office and Madison Gas & Electric (MGE) consumption records, the average annual household consumption of natural gas was ___ therms and the average annual

consumption of fossil fuel-generated electricity was ___ kilowatts. Therefore, the goal equates to an annual household consumption of natural gas of ___ therms and an annual household consumption of fossil fuel-generated electricity of ____kilowatts.

Note:
City staff are currently working with MGE to obtain consumption information. Once received, consumption figures will be normalized for heating and cooling degree days. To further account for seasonal variance, three years of this adjusted data could then be averaged to provide the baseline.

Since there is a mix of housing types included in the "recent construction" figures and there will be a mix of housing types in the planning area, there will not be a distinction between detached (or single-family) and attached (or multi-family) housing types. Further, it is not intended that there will be a distinction regarding consumption per square foot of living area, development density or family size.

3. Reduce Water Consumption

a) The Goal
Reducing residential per capita water use by 25% compared to current city-wide per capita levels through the use of low-flow appliances and fixtures, dual-flow and low-flow toilets, rain barrels, low-impact lawn care design, conservation education and outreach, or other water conservation practices, and to strongly encourage the use of EPA Water Sense-labeled water fixtures, and strongly discouraging the use of outdoor lawn irrigation systems.

b) Sustainability Benefits of the Goal
Primarily addresses sustainability principle 3 by decreasing the impact on the groundwater supply and water surface features such as springs and streams. Other sustainability principles are meet because it also decreases the energy consumption of the water utility (#1) needed for pumping water, decreases the need for additional wells and water distribution infrastructure and assures that current and future human needs for water will be met. (#4)

c) Background Information/Baseline
The current residential per capita water use, based on an average over recent years, is 73.6 gallons per day. The goal of a 25% reduction equates to a per capita use of 55.2 gallons per day.

The aquifer underlying Dane County is the source of the City's water supply. The Madison Water Utility withdraws approximately 30 million gallons of water per day from the aquifer; Treated wastewater is not returned to the groundwater system but rather to the Mississippi River watershed via Badfish Creek and the Rock River. This net transfer of water has led to an average 60-foot decline in the water table over pre-development levels. Area springs have dried up, and this has led to a loss of aquatic habitat as well stresses on surface water quality, especially Lake Wingra. Additionally, pumping water from deep wells and distributing it throughout the City is an energy intensive operation. The Water Utility is the largest consumer of electricity in the City.

For these and other reasons, the City of Madison established water efficiency as a priority with the adoption of the 2008 Water Conservation and Sustainability Plan. The Plan sets a goal of reducing city-wide household water consumption by 20% by 2020. The Plan includes information on current usage and strategies to reduce consumption. Many of the strategies to reduce water consumption are included in this *Plan.*

4. Increase on-site stormwater infiltration

a) The Goal
Infiltrating 25% of the stormwater volume on or adjacent to points of generation through the use of rain gardens, green roofs, porous sidewalks and drives, or other on-site stormwater management practices.

b) Sustainability Benefits of the Goal
Infiltration of stormwater back into the ground on or adjacent to the point of generation minimizes impact on ground water supplies and could eventually help replenish the aquifer. (#3) The multiple infiltration methods provide sustainable ways to reduce erosion, reduce the infrastructure need to handle stormwater run-off and reduce the overall impact on surface water features. This will also impact long-term quality of life for residents. (#4)

c) Background Information/Baseline
Under current storm water regulations, 90% of the pre-development storm water volume for residential development projects and 60% of the pre-development volume for commercial development projects must "stay-on" the development site through a combination of infiltration (into the ground), evaporation (into the air) and transpiration (into the air through plants). The goal is to infiltrate 25% of the stay-on volume on or adjacent to the point of generation.

The stay-on requirement is typically met by directing stormwater to a retention pond, which is a permanent pool of water where sediments carried by stormwater are .filtered out, and an infiltration basin, which facilitates the movement of stormwater into the ground. These facilities are typically located at the lowest point of the development site and serve the entire development if the topography permits. 'While constructing large facilities that serve an entire development is considered efficient, infiltrating stormwater on or adjacent to the source through multiple systems is more effective.

5. Energy Efficient Service Delivery

a) The Goal
The City delivers services in the most energy efficient method possible.

b) Sustainability Benefits of the Goal
The goal addresses sustainability principles by decrease energy consumption (#1), reducing air and water pollution (#3) and enhancing the quality of life for residents (#4) through sustainable design and land use planning.

c) Background Information
As a service provider, the City of Madison and its facilities and operations have a major impact on the environment, the economy and our community. Since the City is both a steward of our environment and a consumer of its resources, it must incorporate the principles of sustainability to ensure that our current and future needs can be satisfied.

Using *The Natural Step* sustainability framework, the City is working to enhance the sustainability of its facilities and operations by reducing its consumption of fossil fuels and other materials extracted from the Earth, reducing its dependence on synthetic and persistent chemicals, and mitigating its impact on physical ecosystems. Since our community will not be truly sustainable unless our residents are healthy, safe and prospering, the City will continue to pursue policies and actions that minimize the barriers that get in the way of residents' ability to meet their basic needs. The City also intends to lead by example.