



# GREEN TIER LEGACY COMMUNITIES: A Guide to Sustainability Practices



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*Where Environmental Leadership Begins*

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# **WELCOME TO THE LEGACY COMMUNITIES GUIDE TO SUSTAINABILITY PRACTICES!**

This guide was designed to aid members of the Green Tier Legacy Communities in selecting and implementing the sustainability practices found in Appendix 3 of the Green Tier Legacy Communities Charter.

## **Acknowledgements**

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## EXECUTIVE SUMMARY

The Legacy Communities Green Tier Charter program started in December 2010, bringing communities from across the state of Wisconsin together to pursue goals of economic, social and environmental sustainability. Through collaboration and sharing of knowledge and resources, these communities aim to move their own sustainability “farther, faster.”

The Charter that unites these communities’ efforts also provides an extensive list of sustainability practices compiled into the Best Management Practices, also known as Appendix 3. The practices are organized into subcategories and broader sections. Each practice also has a designated point value as a means of weighting it. This list of sustainability practices does not, however, include guidance for communities in selecting or implementing these practices.

This Guide is the result of research during the fall of 2012 by a team of University of Wisconsin-Madison graduate students, who are engaged in an interdisciplinary certificate program called CHANGE (Certificate on Humans and the Global Environment). The research approach included phone interviews with representatives of member communities, collaboration with representatives of Green Tier and 1000 Friends of Wisconsin, examination of sustainability-related documents created by member communities, and a review of research literature relevant to the practices in Appendix 3.

The Guide is designed to be utilized by municipal representatives of Legacy Communities. The purpose of the Guide is to connect member communities with resources to guide them in determining the purpose and major environmental, social and economic benefits of each set of sustainability practices, as well as planning resources and opportunities to advance these practices through peer-to-peer exchange and collaboration.

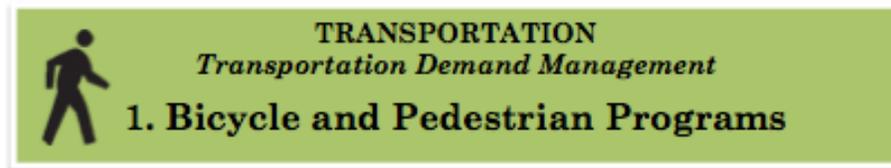
# HOW TO USE THE GUIDE

Green Tier's Best Management Practices consist of five major sections: Transportation, Land Use Policy, Energy, Water, and Waste. Each of these sections contains several categories (e.g. Transportation Demand Management and Transportation System Management). These categories are further divided into subcategories of sustainability practices with a similar purpose (e.g. Bicycle and Pedestrian Programs). This document includes a guide to each of these subcategories. Each guide is designed to support members of the Legacy Community Charter in selecting and implementing the sustainability practices within each subcategory. An explanation of each section of the guide follows.

## 1. Purpose Statement:

This opening statement identifies the main purpose or potential benefits of implementing the sustainability practices in this subcategory.

*Example:*



Practices that encourage walking and biking as an alternative to vehicle use promote health, safety, and cost savings, while decreasing pollution and greenhouse gas emissions.<sup>1</sup>



## 2. Practices and Whom to Contact:

The first column of this table identifies all of the sustainability strategy options included in this subcategory of Green Tier's Best Management Practices. The second column identifies all of the Legacy Community members who have already completed this practice, based on a self-evaluation of earning full points for this practice in their 2011 Annual Report. The third column identifies all of the Legacy Community members who have made some progress on this practice and/or have designated this practice as a goal to improve by 2015, as indicated on their 2011 Annual Report. The purpose of this section is to facilitate peer-to-peer exchanging of lessons learned, resources and opportunities for collaboration for each individual strategy option.

*Example:*

### **Practices and Whom to Contact:**

<b>Strategy Option</b>	<b>Completed</b>	<b>Progress, or Goal by 2015</b>
1. Require bike parking for all new non-residential and multifamily uses.	Fitchburg	Appleton, Bayfield, Middleton, Weston
2. Set standards for placement and number (as a function of the intensity of use) for bike parking spaces.	Fitchburg	Appleton, Bayfield, Middleton, Weston

### **3. Legacy Community Spotlights:**

While the table above identifies the progress of each member community on Green Tier’s designated strategy options, it fails to capture the rich variety of types of projects that member communities have undertaken to advance the goals of the subcategory. The purpose of the Legacy Community Spotlights is to inspire communities to learn from the innovative proposals and projects occurring in other member communities. These examples are quoted directly from three main sources: 1) Legacy Community annual reports, 2) reports found on the Legacy Communities website ([www.greentiercommunities.org](http://www.greentiercommunities.org)), and 3) other Legacy Community municipal reports, such as Middleton’s Sustainable City Plan or Bayfield’s Comprehensive Plan.

*Example:*

#### **Legacy Community Spotlights:**

##### **Appleton:**

- “Added more sidewalks in area to promote walking” and plans to “install one mile of new sidewalk”
- “Added bike lanes by redesigning existing streets to accommodate bike traffic.”
- Valley Transit “implemented Rack & Roll bike racks on buses.”

### **4. Potential Benefits of Practices**

This table offers a synopsis of the research literature regarding the potential benefits of implementing sustainability categories within the subcategory. The three columns – economic, social, and environmental impact – were selected based on the three dimensions of sustainability found in the Legacy Communities Charter as well as survey results from Legacy Community members when asked to rank the “criteria that are most important in deciding which strategy options to pursue.” The benefits in each column are sorted by those directly benefitting “Municipal Operations,” and those benefitting the “Community” at large, including individual citizens, local businesses and the larger society. The purpose of this section is to provide concise information about the benefits of each set of practices that could be used either for internal promotion of a strategy option, for external promotion to community members or for public outreach and education.

*Example:*

**Potential Benefits of Practices:**

<b>Economic impact</b>	<b>Social impact</b>	<b>Environmental impact</b>
<p><i>Municipal Operations:</i></p> <ul style="list-style-type: none"> <li>• Cost savings when municipal employees commute by bike</li> </ul>	<p><i>Community:</i></p> <ul style="list-style-type: none"> <li>• Decrease in congestion and rush hour traffic</li> <li>• Increased road safety</li> </ul>	<p><i>Community:</i></p> <ul style="list-style-type: none"> <li>• Decrease in air pollution, including CO, NOx and VOC</li> </ul>

**5. Guides:**

This section offers a list of planning guides developed by other municipalities (e.g. Fitchburg’s guide to Idling Reduction), state sustainability programs (e.g. Sustainable Jersey), government agencies (e.g. Wisconsin Department of Transportation), or planning associations (e.g. American Planning Association), which is identified in the column labeled “Source.” The “Contents” column offers a brief synopsis of the major sections of the guide, and the “Link” is a direct hyperlink to the guide.

*Example:*

**Guides:**

<b>Guide</b>	<b>Source</b>	<b>Contents</b>	<b>Link</b>
Safe Routes to School	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p7!31.pdf">http://sustainablejersey.com/editor/doc/p7!31.pdf</a>
Complete Streets	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p8!31.pdf">http://sustainablejersey.com/editor/doc/p8!31.pdf</a>

**6. References**

The references for each subcategory guide can be found in the back of this document, separated by subcategory.



## TRANSPORTATION

### *Transportation Demand Management*

# 1. Bicycle and Pedestrian Programs

Practices that encourage walking and biking as an alternative to vehicle use promote health, safety, and cost savings, while decreasing pollution and greenhouse gas emissions.<sup>1</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Require bike parking for all new non-residential and multifamily uses.	Fitchburg	Appleton, Bayfield, Middleton, Weston
2. Set standards for placement and number (as a function of the intensity of use) for bike parking spaces.	Fitchburg	Appleton, Bayfield, Middleton, Weston
3. Make commuter bike routes identifiable and cleared.	Appleton, Fitchburg	Bayfield, Middleton, Weston
4. Obtain recognition by the League of American Bicyclists certification. (Bronze 5, Silver 7, Platinum 10)		Appleton, Fitchburg, Middleton, Weston
5. Funding and operating for Safe Routes to School SRTS program (or functional equivalent) covering at least 10 percent of students.		Appleton, Bayfield, Fitchburg, Middleton, Weston
6. Conduct annual survey of students' mode of transport to school.		Appleton, Bayfield, Fitchburg, Middleton, Weston

<sup>1</sup> Image from <http://3.bp.blogspot.com/-yC0uLGjEuoA/T5jEuWOkkfI/AAAAAAAAABnc/uPDG6OWqT6k/s400/bike+ped>

## **Legacy Community Spotlights:**

### **Appleton:**

- “Added more sidewalks in area to promote walking”
- “Added bike lanes by redesigning existing streets to accommodate bike traffic.”
- Valley Transit “implemented Rack & Roll bike racks on buses.”
- Plan to “increase the quantity of bike paths, bike storage, etc.” including “a City Wide on-street bike lane plan” and “bike racks in downtown area”

### **Bayfield:**

- Plans to “identify parcels within and adjacent to the City as areas for potential easement acquisition or land purchase for future trail network development”
- Plans to “develop a bicycle transportation plan”
- Plans to “work to ensure that all pedestrian destinations are adequately connected (school, downtown district, waterfront, and residential areas, etc.) and encourage foot travel to ease traffic and parking congestion”

### **Fitchburg:**

- "Hosting numerous public forums and expos on topics including transportation”
- “Savings were accumulated through a bike-commuting competition held by city staff” – “18 Fitchburg staff and elected officials participated totaling 6,340 miles of bicycling and walking instead of driving to work”
- “High-quality bike trails for residents to enjoy its natural beauties and commute to work without a car.”
- “New bike signs to designate bike lanes”
- “Bike Rodeo event... to teach kids/parents safe bicycle riding skills”

### **Middleton:**

- "Accessible 17-mile trail system"
- Target to increase “percentage of collector streets with marked bike lanes” from 11% in 2009 to 65% in 2015
- Goal to increase “percentage of collector streets with sidewalks on both sides of the street”
- Plans to “construct the Good Neighbor Trail and the bike path along the railroad corridor to Madison” by 2020
- Plans to “work with the High School to encourage students to use alternative forms of transportation”
- Plans to “develop recommendations for bicycle parking in commercial areas”

### **Weston:**

- "Conversion of a suburban no sidewalk community into a place where families could walk, jog and bike” by adding “over 3 miles of Multi-Use Paths... [and] 0.5 miles of new sidewalk, and a pedestrian bridge”
- Plans to “raise the community’s walk-ability score two-fold in less than five years and reduce the use of automobiles in the community”

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Cost savings when municipal employees commute by bike</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Reduced traffic on local roads, resulting in:               <ul style="list-style-type: none"> <li>○ congestion reduction</li> <li>○ traffic safety improvements</li> <li>○ roadway cost savings</li> <li>○ parking cost savings</li> </ul> </li> <li>• Increased bike and pedestrian traffic, resulting in:               <ul style="list-style-type: none"> <li>○ economic impact of manufacturing, sales and services</li> <li>○ economic impact of tourism and recreation</li> <li>○ increased property values</li> </ul> </li> <li>• Increased physical activity, resulting in:               <ul style="list-style-type: none"> <li>○ reduced health costs for employers</li> </ul> </li> <li>• Long-term economic value of air and noise pollution reduction</li> <li>• Long-term economic value of greenhouse gas emissions reduction</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Decrease in congestion and rush hour traffic</li> <li>• Increased road safety</li> <li>• Perceived neighborhood safety</li> <li>• Neighborhood social cohesion due to increased people-to-people connections while biking and walking</li> <li>• Address the disproportionate impact of transportation costs on low-income families</li> <li>• Improved overall physical and mental health</li> <li>• Decrease in diseases related to physical inactivity such as heart disease, hypertension, stroke, depression, diabetes, osteoporosis, cancer and dementia</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Decrease in air pollution, including CO, NO<sub>x</sub> and VOC emissions from fossil fuel use</li> <li>• Decrease in greenhouse gas emissions and climate change</li> </ul>

## Guides:

Guide	Source	Contents	Link
Safe Routes to School	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p7!31.pdf">http://sustainablejersey.com/editor/doc/p7!31.pdf</a>
Complete Streets	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p8!31.pdf">http://sustainablejersey.com/editor/doc/p8!31.pdf</a>



## TRANSPORTATION

### *Transportation Demand Management*

## 2. Employer-Based Programs

Employers can promote transportation options with greater economic, social and environmental benefits through measures such as offering tax-free incentives for commuting alternatives to driving alone.<sup>2</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Require large employers seeking rezoning to set a price signal (cash-out or charge).		
2. Require large employers seeking rezoning to provide subsidized transit.		
3. Require large employers seeking rezoning to provide a Transportation Demand Management (TDM) plan that would reduce trips by 20% over “business as usual.”		

### Legacy Community Spotlights:

#### Appleton:

- Plans to “encourage employees to walk or bike to their meetings, projects, etc. when feasible”
- Plans to “analyze the potential to have City employees carpool during work day hours”
- Plans to “create ordinance requiring all businesses with 30 or more employees to provide bike accommodations”
- Plans to “work to implement a regional policy to reduce the percentage of commute trips by single occupancy vehicles by 10%, relative to an established baseline year”

#### Middleton:

- Plans to “determine whether part-time telecommuting for certain city staff functions is feasible and develop policies (no cost)”

<sup>2</sup> Image from <http://www.virginia.edu/parking/images/tdmImages/TDMarrow.jpg>

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Demand-side congestion-management strategies tend to be more cost-effective than supply-side (i.e. road expansion)<sup>3</sup></li> <li>• Reduced demand for new road and parking infrastructure</li> <li>• More effective and efficient use of transit system</li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Lower commute costs for employees due to lower fixed costs and cost-sharing options: vanpool participants report saving up to \$3000 or more a year on gas and car maintenance<sup>4</sup></li> <li>• Improved employee retention and recruitment, especially in cases of improved transit or telecommuting options</li> <li>• Commuter tax benefits save employers on payroll taxes, because these benefits are considered a tax-free fringe benefit rather than salary/wages</li> <li>• Decreased costs related to air pollution, crashes and congestion</li> <li>• If half of all U.S. employees participated in alternative commuter programs, this would be the equivalent of taking 15 million cars off the road at a savings of \$12 billion in fuel costs<sup>5</sup></li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Reduced stress and commute times with decreasing roadway congestion</li> <li>• Improved quality of life as commuters can talk, eat, sleep or read using transit or carpools/vanpools</li> <li>• Improved morale and productivity when telecommuting</li> <li>• Improved transportation equity and diversity of options</li> <li>• Fewer road construction impacts</li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Decrease in land use for sprawling worksites served by expanding parking lots</li> <li>• Decrease in air pollution</li> <li>• Decrease in greenhouse gas emissions and climate change</li> </ul>

<sup>3</sup> Hattum, D. Van. (2004). *Expanding Commuter Options in the Twin Cities*. Minneapolis, MN.

<sup>4</sup> Best Workplaces for Commuters. (2009). *Commuter Benefit Briefs*. National Center for Transit Research at USF.

<sup>5</sup> Dierkers, G., Silsbe, E., Stott, S., Winkelman, S., & Wubben, M. (2007). *CCAP Transportation Emissions Guidebook*. Washington, D.C.

## Guides:

Guide	Source	Contents	Link
Commuter Benefit Briefs	National Center for Transit Research at USF	Website with implementation guides for employer-based travel demand management practices, including: carpool incentives, commuter tax benefits, parking cash out, telework, transit and vanpool	<a href="http://www.bestworkplaces.org/resource-center/commuter-benefit-briefs/">http://www.bestworkplaces.org/resource-center/commuter-benefit-briefs/</a>
Transmission Emissions Guidebook: Commuter Incentives	Center for Clean Air Policy	See pages 69-73: overview of commuter incentive programs, policy quantification, emissions and fuel savings calculations, co-benefits, implementation issues, case studies, resources	<a href="http://sustainablejersey.com/editor/doc/p7!21.pdf">http://sustainablejersey.com/editor/doc/p7!21.pdf</a>
Expanding Commuter Options in the Twin Cities: Employer Programs	Minneapolis, MN	See pages 14-15: voluntary and mandatory employer-based travel demand management programs, public-private partnerships, government agencies	<a href="http://www.nextstep.state.mn.us/download/expandingcommuteroptions.pdf">http://www.nextstep.state.mn.us/download/expandingcommuteroptions.pdf</a>



**TRANSPORTATION**  
*Transportation Demand Management*

### 3. Traffic Volume

Traffic volume decreases as transit and other alternative transportation become more convenient and cost-effective than driving and parking a single-occupancy vehicle.<sup>6</sup>



#### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Track VMT or traffic counts and report on efforts at reduction (including those on this list).		Appleton, Middleton, Weston
2. Eliminate parking minimums from non-residential districts.		Middleton
3. Set parking maximums at X per square feet for office and retail uses.		Bayfield, Middleton
4. Scheduled transit service at basic level (hour peak service within half-mile of 50 percent of addresses).	Bayfield, Middleton	
5. Scheduled transit service at enhanced level (half-hour peak service within 75 percent of addresses).	Middleton	

<sup>6</sup> Image from [http://www.parkeon.com/nam/images/stories/Traffic\\_vehicules\\_USA.jpg](http://www.parkeon.com/nam/images/stories/Traffic_vehicules_USA.jpg)

## **Legacy Community Spotlights:**

### **Appleton:**

- “The City has [had success] towards sustainability in the [area] of... mass transit.”
- Plans to “modify City Ordinance to eliminate minimum parking stall requirements”
- Goal to “reduce long commutes by providing a wide array of transportation and housing choices near jobs for a balanced, healthy City”
- Target to “work with community partners to develop and implement a policy that expands affordable public transportation coverage to within one-quarter mile of all city residents”
- Target to “work with community partners to reduce household vehicle miles traveled by 25%, relative to an established baseline year”

### **Bayfield:**

- “Provided each household in the City with a bus pass.”
- “BART (Bay Area Rural Transportation)... is fun, very affordable with several payment plans, and currently has six round trip runs per day (every two hours) between Red Cliff and Odanah.”
- Published Earth Care booklet that encourages citizens to “use environmentally friendly fuel, public transportation, and walking”
- Vision Statement: “traffic congestion is managed by providing adequate parking (some of it remote, with shuttle service)”

### **Fitchburg**

- “Existing bus stops were elevated based on ridership and 10 most heavily used stops”

### **Middleton**

- “Submitted a TIGER II grant application to fund a parking/transit center in downtown” (Time, \$)
- Vision Statement: “An extensive multi-modal transportation network that is accommodating to the needs of all people, regardless of age, ability or income. City transportation infrastructure is integrated with a regional system that combines timely, cost-effective public transportation options with a safe and ubiquitous network of routes for walking and bicycling.”
- Target to increase “Metro Bus Trips per capita per year” from 8% in 2009 to 10% by 2014
- Goal to increase “Community Car members”

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• More cost-effective use of existing transportation infrastructure</li> <li>• Travel demand management – especially decisions about parking supply and prices – can increase the demand for future investment in transit, rather than more costly road expansion<sup>7</sup></li> <li>• The cost of accommodating one more single-occupancy vehicle trip by expanding roads is \$1,258/year; accommodating this additional trip using travel demand management strategies is only \$530/year<sup>8</sup></li> <li>• Improved transit reduces the demand for public parking lots, which return three times less tax revenue than using this space for development<sup>9</sup></li> <li>• Travel demand management may be more cost-effective in urban areas through buses and in rural areas by carpools/vanpools<sup>10</sup></li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Increased transit options decreases need to provide employees with free parking, which can cost \$2,500-5,000 per space to build surface parking, or \$10,000-20,000 per space for structured parking, plus hundreds of dollars in maintenance per space, per year<sup>11</sup></li> <li>• Traffic congestion reduces the region’s economic competitiveness<sup>12</sup></li> <li>• Value of reduction of air and noise pollution and greenhouse gas emissions</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Improved quality of life due to less personal time lost in traffic congestion</li> <li>• Improved convenience of transit and other alternatives to driving alone</li> <li>• Increased road safety</li> <li>• Significantly reduced congestion when a small percentage of vehicles are taken off the road during high-use times</li> <li>• Improved equity, as potential employees without cars can use transit to access workplaces</li> <li>• Improved links through transit connections between diverse communities, institutions and businesses</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Decrease in air and water pollution due to fewer vehicles</li> <li>• Decrease in destruction of wildlife habitat to expand roadways vs. increasing efficiency through carpools, vanpools, buses, etc.</li> <li>• Decrease in greenhouse gas emissions and climate change</li> </ul>

<sup>7</sup> Hattum, D. Van. (2004). *Expanding Commuter Options in the Twin Cities*. Minneapolis, MN.

<sup>8</sup> Hattum, D. Van. (2004). *Expanding Commuter Options in the Twin Cities*. Minneapolis, MN.

Retrieved from <http://www.nextstep.state.mn.us/download/expandingcommuteroptions.pdf>

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Hattum, D. Van. (2004). *Expanding Commuter Options in the Twin Cities*. Minneapolis, MN.

<sup>12</sup> Ibid.

## Guides:

Guide	Source	Contents	Link
Expanding Commuter Options in the Twin Cities	Minneapolis, MN	Summary of transportation demand management strategies, recommendations, cost-effectiveness, case studies	<a href="http://www.nextstep.state.mn.us/download/expandingcommuteroptions.pdf">http://www.nextstep.state.mn.us/download/expandingcommuteroptions.pdf</a>
Transit-Oriented Development Guidebook	St. Paul, MN Department of Planning and Economic Development	Tips for existing businesses and property owners about adapting to new transit options, policy guidance and design standards	<a href="http://stpaul.gov/DocumentCenter/Home/View/19527">http://stpaul.gov/DocumentCenter/Home/View/19527</a>



**TRANSPORTATION**  
*Traffic System Management*

## 4. Preservation and Improvement

Comprehensive road maintenance programs and impact fees decrease or offset long-term costs. Complete streets and travel demand management help existing infrastructure accommodate more people, while delivering safety, health, equity and environmental benefits.<sup>13</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Develop and fully fund a comprehensive maintenance program for existing roads.	Appleton, Bayfield, Fitchburg	Middleton
2. Charge impact fees for new roads.		
3. Calculate lane-miles per capita for arterials and collectors, and show reductions.	Appleton	Fitchburg, Middleton
4. Prepare a plan identifying disconnections in bike and pedestrian networks, prioritizing the establishment of new connections and identifying potential funding sources for the most important projects.	Middleton	Appleton, Bayfield, Fitchburg, Weston
5. Any proposal to add lanes to a two-lane roadway shall be evaluated for a center turn lane, the preferred option over an expansion to four lanes.		Middleton, Weston
6. Identify four-lane roadways with fewer than 20,000 vehicles per day (AADT) and evaluate them for “road diets” with bike lanes or on-street parking.		Appleton, Fitchburg, Middleton, Weston

<sup>13</sup> Image from [http://farm4.staticflickr.com/3426/3772441958\\_fef9ebe3a6.jpg](http://farm4.staticflickr.com/3426/3772441958_fef9ebe3a6.jpg)

## **Legacy Community Spotlights:**

### **Appleton:**

- Plans to “work to maximize the quantity of roads in the City that are ‘Complete Streets,’ efficient and safe for all modes of travel”

### **Bayfield:**

- Plans to “develop a long-range street improvement and expansion plan”

### **Middleton:**

- Adopted “an ordinance requiring that all streets in Middleton are ‘complete streets”
- Goal to decrease “City accidents per capita”

### **Weston:**

- “Working to identify roads that can be reduced from 4 to 2 lanes with a shared turn lane”

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Comprehensive maintenance plans (e.g. crack sealing program) save money in the long run and avoid higher costs of retrofitting: for example, one dollar spent on drainage saves two dollars on maintenance<sup>14</sup></li> <li>• Complete Streets policies increase efficiency of transportation system, reducing road congestion, wear and tear, and need for additional infrastructure</li> <li>• Center turn lanes are low cost (i.e. restriping) and may lead to a 29% reduction in auto crashes<sup>15</sup></li> <li>• Impact fees can offset costs of providing roads for a new development</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Complete Streets initiatives allow individuals to consider more cost-effective alternative transportation</li> <li>• Improved road maintenance reduces wear and tear on vehicles</li> <li>• Complete Streets lead to increased property values and sales for local businesses</li> <li>• Value of air and noise pollution reduction</li> <li>• Value of greenhouse gas emissions reduction</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Complete Streets improve equity by making more transportation options available to youth, elderly, low-income families and non-drivers</li> <li>• Complete Streets promote more active transportation, leading to community health improvements</li> <li>• Complete Streets and center turn lanes reduce traffic congestion, improve safety and reduce injuries and fatalities for all travelers: traffic-calming measures may reduce speeding by 40% and accidents by 50%<sup>16</sup></li> <li>• More walkable neighborhoods increase community interaction</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Improved air quality from decrease in vehicle emissions</li> <li>• Decrease in external costs of wastes, fossil fuel consumption, sprawled land use, and water, air and noise pollution due to vehicles</li> <li>• Decrease in greenhouse gas emissions: it is especially important to mitigate growth in vehicle miles traveled (VMT), because currently the increase in VMT outstrips the advantages of increased fuel economy and emission control<sup>17</sup></li> <li>• Mitigates climate change: if one average driver leaves the car home just two days a week greenhouse gas emissions will be reduced by 1600 pounds per year<sup>18</sup></li> </ul>

<sup>14</sup> Bonestroo. (2009). Town of Grafton - Pavement Maintenance Program. Grafton, WI.

<sup>15</sup> Federal Highway Administration. Proven Safety Countermeasures: “Road Diet” (Roadway Reconfiguration). *U.S. Department of Transportation*.

<sup>16</sup> Minnesota Complete Streets Coalition. (2011). *Complete Streets: Supporting Safe and Accessible Roads for Everyone: Local toolkit*. St. Paul, MN.

<sup>17</sup> Dierkers, G., Silsbe, E., Stott, S., Winkelman, S., & Wubben, M. (2007). *CCAP Transportation Emissions Guidebook*. Washington, D.C.

<sup>18</sup> Sustainable Jersey. (2012). *Complete Streets Program* (pp. 1–10). Ewing, NJ.

## Guides:

Guide	Source	Contents	Link
Transportation Cost and Benefit Analysis	Victoria Transport Policy Institute	Literature review and analysis of costs and benefits, including vehicle costs, travel time, safety, parking, congestion, roadway facilities, land use impacts, pollution, etc.	<a href="http://www.vtpi.org/tca/">http://www.vtpi.org/tca/</a>
Complete Streets	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p8!31.pdf">http://sustainablejersey.com/editor/doc/p8!31.pdf</a>
Complete Streets, Best Policy and Implementation Practices	American Planning Association	Case studies and guidelines for complete streets planning, policy-making, handling costs, etc.	<a href="http://www.smartgrowthamerica.org/documents/cs/resources/cs-bestpractices-chapter5.pdf">http://www.smartgrowthamerica.org/documents/cs/resources/cs-bestpractices-chapter5.pdf</a>
Complete Streets Local Government Toolkit	MN Complete Streets Coalition	Benefits, steps for planning and policy-making, sample resolution, sample opinion pieces	<a href="http://www.mncompletestreets.org/gfx/MnCSLocalGovtToolkit.pdf">http://www.mncompletestreets.org/gfx/MnCSLocalGovtToolkit.pdf</a>
Programs for Local Government	WI Department of Transportation	Links to state and federal programs to support local transportation projects; see “Local Transportation Enhancements” under Other aid	<a href="http://www.dot.state.wi.us/localgov/index.htm">http://www.dot.state.wi.us/localgov/index.htm</a>
Pavement Maintenance Program	Town of Grafton, Bonestroo	Maintenance strategies, road classification and analysis tools, financing options	<a href="http://www.townofgrafton.org/uploads/images/2009%20Pavement%20Maintenance%20Program(1).pdf">http://www.townofgrafton.org/uploads/images/2009%20Pavement%20Maintenance%20Program(1).pdf</a>
Land Use, Transit and Travel Demand Management	Center for Clean Air Policy	Background on initiatives to promote transportation demand management, fiscal tools and incentives	<a href="http://ccap.org/assets/CCAP-Transportation-Guidebook-1.pdf">http://ccap.org/assets/CCAP-Transportation-Guidebook-1.pdf</a>



**TRANSPORTATION**  
*Traffic System Management*

**5. Electric Vehicles**

Electric vehicles reduce air pollution, mitigate climate change, bolster the local economy and can pay for themselves through tax credits and fuel savings.<sup>19</sup>



**Practices and Whom to Contact:**

Strategy Option	Completed	Progress, or Goal by 2015
1. Allow Neighborhood Electric Vehicles (NEVs) on appropriate roadways.	Appleton, Bayfield, Fitchburg, Middleton	Weston
2. Provide public charging stations.	Middleton	Appleton, Bayfield, Weston

**Legacy Community Spotlights:**

**Appleton:**

- Public Works “has purchased hybrid vehicles where feasible”
- Valley Transit “purchased hybrid technology buses that store energy as bus costs which is then used to power the bus upon starting from a stop”
- Plans to “analyze the potential for incentives provided to downtown parking for those driving hybrid or low emissions vehicles”
- Plans to “endorse regional Neighborhood Electric Vehicle (NEV) ordinances” and “analyze the potential for incentives for NEV usage”

**Bayfield:**

- “Neighborhood Electric Vehicle (NEV) for City Utilities”

**Fitchburg:**

- “Two electric vehicle charging stations installed – near the Community Center and Library”

**Middleton:**

- “The Common Council funded the purchase of two electric vehicles for the City fleet, to be purchased in 2012”
- Plans to “research potential uses for hybrid or alternative energy vehicles in the City fleet” (\$\$)

<sup>19</sup> Image from [http://greentiercommunities.org/?page\\_id=70](http://greentiercommunities.org/?page_id=70)

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>Higher purchase price offset by federal tax credit and fuel savings (up to \$1,600 per year compared to a gasoline car if 15,000 miles driven per year)<sup>20</sup></li> <li>NEVs qualify for tax credit for up to 10% of the purchase price up to \$7500<sup>21</sup></li> <li>NEVs have low fuel costs: each avoids 87 gallons of fuel use per year<sup>22</sup></li> <li>NEVs have low operating expenses and do not require oil changes or engine repairs<sup>23</sup>: a study found 91% of 348 NEVs had no maintenance problems, 14 needed battery pack replaced</li> <li>Cost to convert gasoline vehicles to electric (between \$10,000-20,000) is offset by fuel savings over vehicle lifetime<sup>24</sup></li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Charging stations bolster market acceptance of EVs, which can lead to decreasing prices as production volumes increase</li> <li>Keeping money in local economy</li> <li>Spur growth of EV industries</li> <li>Value of air and noise pollution reduction</li> <li>Value of greenhouse gas emissions reduction</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Flexible fueling for individuals, since EVs can be charged overnight, at work or at a public charging station</li> <li>Reduced noise pollution</li> <li>Reduce all emissions that cause adverse health conditions, particularly in urban settings</li> <li>Project positive community leadership through highly visible EV fleets</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Each NEV avoids the generation of 2-7 lbs. of smog-forming emissions annually<sup>25</sup></li> <li>Switching to EVs reduces particulate matter by 31%, NO<sub>x</sub> by 69%, SO<sub>x</sub> by 75%,<sup>26</sup> VOC and CO by 100%<sup>27</sup></li> <li>Reduces greenhouse gas emissions by 74%<sup>28</sup>, especially since nearly 1/8 of energy-related CO<sub>2</sub> emissions are due to passenger vehicles<sup>29</sup></li> <li>No tailpipe emissions, but should consider emissions associated with production of electricity</li> <li>Even fewer emissions if solar panels are added to EV rooftops</li> </ul>

<sup>20,7</sup> U.S. Department of Energy. (2012). Electricity. *Alternative Fuels Data Center*. Retrieved December 2, 2012, from <http://www.afdc.energy.gov/fuels/electricity.html>

<sup>21,8</sup> Rocky Mountain Institute. (2012). *EV City Casebook: A Look at the Global Electric Vehicle Movement*. Boulder, CO. Retrieved from [http://www.rmi.org/Content/Files/EV\\_City\\_Casebook\\_2012\\_1.2.pdf](http://www.rmi.org/Content/Files/EV_City_Casebook_2012_1.2.pdf)

<sup>22,5</sup> U.S. Department of Energy. (2012). *Plug-In Electric Vehicle Handbook for Fleet Managers*. Washington, D.C. Retrieved from [http://www.afdc.energy.gov/pdfs/pev\\_handbook.pdf](http://www.afdc.energy.gov/pdfs/pev_handbook.pdf)

<sup>24</sup> Sustainable Jersey. (2012). *Green Fleets: Vehicle Conversions* (pp. 1–9). Ewing, NJ. Retrieved from <http://sustainablejersey.com/editor/doc/p12!141.pdf>

<sup>27</sup> City of Portland. (2010). *Electric Vehicles: The Portland Way*. Portland, OR. Retrieved from <http://media.oregonlive.com/commuting/other/1046.pdf>

<sup>28,11</sup> Sustainable Jersey. (2012). *Green Fleets: Purchase Alternative and Efficient Vehicles* (pp. 1–9). Ewing, NJ. Retrieved from <http://sustainablejersey.com/editor/doc/p12!131.pdf>

## Guides:

Guide	Source	Contents	Link
Best Practices Guide: Neighborhood Electric Vehicles	WI Clean Cities	Background, benefits, tips for cold weather operation, safety standards, WI laws and incentives, resources	<a href="http://www.wiclcities.org/pdfs/BestPracticesNEV.pdf">http://www.wiclcities.org/pdfs/BestPracticesNEV.pdf</a>
Green Fleets: Purchase Alternative and Efficient Vehicles	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p12!131.pdf">http://sustainablejersey.com/editor/doc/p12!131.pdf</a>
Green Fleets: Vehicle Conversions	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p12!141.pdf">http://sustainablejersey.com/editor/doc/p12!141.pdf</a>
Plug-In Electric Vehicle Handbook for Fleet Managers	U.S. Department of Energy	Basics about plug-in electric and hybrid vehicles, factors affecting performance, benefits, buying guide, incentives, conversions, driving, maintenance, charging	<a href="http://www.afdc.energy.gov/pdfs/pev_handbook.pdf">http://www.afdc.energy.gov/pdfs/pev_handbook.pdf</a>
Electric Vehicles: The Portland Way	City of Portland	Municipal strategy, including: policies, tax incentives and working with local businesses	<a href="http://media.oregonlive.com/commuting/other/1046.pdf">http://media.oregonlive.com/commuting/other/1046.pdf</a>
Neighborhood Electric Vehicle Fleet Use	U.S. Department of Energy	Study of 15 NEV fleets, including calculated benefits and vehicle issues	<a href="http://www1.eere.energy.gov/vehiclesandfuels/avta/pdfs/nev/nev_study.pdf">http://www1.eere.energy.gov/vehiclesandfuels/avta/pdfs/nev/nev_study.pdf</a>
Carbon and Petroleum Footprint Calculator	Argonne National Lab and U.S. Department of Energy	Calculator for fleet managers to estimate petroleum use and greenhouse gas emissions	<a href="http://greet.es.anl.gov/carbon_footprint_calculator">http://greet.es.anl.gov/carbon_footprint_calculator</a>
Alternative Fueling Stations Locator	U.S. Department of Energy	Search by address to find electric charging and other alternative fueling stations	<a href="http://www.afdc.energy.gov/locator/stations/">http://www.afdc.energy.gov/locator/stations/</a>



**TRANSPORTATION**  
*Traffic System Management*

**6. Vehicle Idling**

Banning voluntary vehicle idling costs little and saves a lot on fuel and vehicle maintenance, as well as the long-term costs of pollution-related illness and climate change.<sup>30</sup>



**Practices and Whom to Contact:**

Strategy Option	Completed	Progress, or Goal by 2015
1. Ban idling (more than 5 minutes) with local government vehicles.	Appleton, Bayfield, Fitchburg	Middleton, Weston
2. Ban idling (more than 5 minutes) community-wide.		Appleton, Bayfield, Fitchburg

**Legacy Community Spotlights:**

**Appleton:**

- Public Works “has created a vehicle idling policy.”

**Fitchburg:**

- “Vehicle Idling Reduction Report finalized; resolution approved”

**Middleton:**

- Plans to “use Safe Routes to School Air Quality grant for the Northside School to determine air quality and create program for improving air quality, including signs, that focuses on reducing idling”
- Plans to “evaluate City vehicle idling policies and make recommendations” (no cost)

<sup>30</sup> Image from [http://www.airwatchnw.org/wp-content/uploads/2010/03/Graphic\\_logo.jpg](http://www.airwatchnw.org/wp-content/uploads/2010/03/Graphic_logo.jpg)

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Save money by reducing fuel use (idling for more than 30 seconds burns more gas than restarting the engine): Milwaukee’s Public Works fleet increased fuel economy by 13% after DNR Eco-Driving Training<sup>31</sup></li> <li>• Save money on vehicle repairs by reducing engine wear and tear, as excessive idling leads to partially combusted fuel residues that damage cylinders, spark plugs and exhaust systems</li> <li>• Anti-idling campaign is low cost investment (printing, signage, staff time to install and enforce)</li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• No-cost action for individuals, since modern vehicles do not require warm-up period and turning vehicle on and off does not harm engine</li> <li>• Reduced cost of health care for individuals and employers, since illnesses are exacerbated by vehicle exhaust (e.g. asthma expenses can cost up to \$500/child/year)</li> <li>• Value of air pollution and greenhouse gas emissions reduction</li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Reduced risk of asthma: studies suggest diesel emissions not only exacerbate asthma but prolonged exposure can cause it and increase the risk of asthma in the unborn</li> <li>• Reduced risk of heart and lung disease caused by fine particle pollution from diesel exhaust: children and elderly are especially at risk</li> <li>• Reduced risk of heart attacks triggered by moderate air pollution</li> <li>• Reduced risk of lung cancer due to long-term exposure to soot and polycyclic aromatic hydrocarbons in diesel exhaust</li> <li>• Reduces inequity of environmental hazards imposed on residents who live in proximity to areas of high idling, exhaust</li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Improved air quality from decreasing pollution from exhaust, including: volatile organic compounds, nitrogen oxides (which contribute to ozone and acid rain), hydrocarbons (which combine to form ozone, leading to smog), and carbon monoxide (reduces oxygen flow and impairs mental functions)</li> <li>• Decrease in greenhouse gas emissions and climate change: almost 95% of auto emissions are CO<sub>2</sub>. For every 2 minutes of idling, one pound of CO<sub>2</sub> is emitted. If all cars in Chicago reduced idling by 5 minutes per day, 25.5 tons of CO<sub>2</sub> emissions would be cut.<sup>32</sup></li> </ul>

<sup>31</sup> Resource Conservation Committee of Fitchburg. (2011). *Idling Reduction Study and Recommendations for Fitchburg, Wisconsin*. Fitchburg, WI.

<sup>32</sup> Ibid.

## Guides:

Guide	Source	Contents	Link
Anti-Idling Education and Enforcement Program	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p7!21.pdf">http://sustainablejersey.com/editor/doc/p7!21.pdf</a>
Green Fleets: Driver Training	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p12!121.pdf">http://sustainablejersey.com/editor/doc/p12!121.pdf</a>
Idling Reduction Study and Recommendations	Resource Conservation Committee, Fitchburg, WI	Regulatory environment, behavioral and technological strategies to reduce idling, financial incentives, recommendations, benefits, barriers	<a href="http://www.city.fitchburg.wi.us/departments/cityHall/publicWorks/documents/IdlingReporttoCOW5-25-11.pdf">http://www.city.fitchburg.wi.us/departments/cityHall/publicWorks/documents/IdlingReporttoCOW5-25-11.pdf</a>



LAND USE POLICY  
*Zoning and Development*

# 1. Infill Development

Infill development reduces urban sprawl, improves the livability of city centers, and protects open spaces.<sup>33</sup>



### Practices and Whom to Contact:

Strategy Option (Points)	Completed	Progress, or Goal by 2015
1. Identify priority areas for infill development, including those eligible for “brownfields funding.”	Appleton, Bayfield, Fitchburg, Middleton,	Weston
2. Create land bank to acquire and assemble priority infill sites.		Bayfield
3. Develop an inventory of known contaminated properties for reuse planning, with possible GIS application.	Appleton, Bayfield, Weston	Fitchburg, Middleton

### *Legacy Community Spotlights:*

#### **Middleton**

- Emphasizing “compact growth, infill development, and density-focused land-use planning”

<sup>33</sup> Image from <http://www.wisconsinwatch.org/2012/09/23/recession-worsens-brownfields-backlog-in-wisconsin/>

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations</b></p> <ul style="list-style-type: none"> <li>Infill capitalizes on existing infrastructure and minimizes the need for costly new infrastructure</li> </ul>	<p><b>Community</b></p> <ul style="list-style-type: none"> <li>Prevents agricultural land from being converted to urban land</li> <li>Protects sensitive habitat and open space from new development</li> <li>Protects historical preservation sites</li> <li>Enriches quality of life by bringing vibrancy, community and social connection to neighborhoods</li> </ul>	<p><b>Community</b></p> <ul style="list-style-type: none"> <li>Improves air quality due to decreased travel time</li> <li>Reduces thermal pollution</li> <li>Reduces stormwater runoff resulting in flooding and pollution of waterways<sup>34</sup></li> <li>Encourages carbon sequestration</li> </ul>

## Guides:

Guide	Source	Contents	Link
Brownfields Funding Guide	EPA	Funding opportunities for infill development	<a href="http://www.epa.gov/brownfields/applicat.htm">http://www.epa.gov/brownfields/applicat.htm</a>
Guidebook for Analysis and Implementation in Maryland	University of Maryland	Guide to conducting development capacity analysis	<a href="http://planning.maryland.gov/pdf/OurWork/dev_cap/Final_Guidebook.pdf">http://planning.maryland.gov/pdf/OurWork/dev_cap/Final_Guidebook.pdf</a>
Chapter 4: Reuse and Infill	Center for Neighborhood Technology & American Rivers	Overview on estimating reuse potential and costs, measures to encourage reuse	<a href="http://www.envisionutah.org/Urban%20Planning%20Tools%20for%20QG_ch4_1.pdf">http://www.envisionutah.org/Urban%20Planning%20Tools%20for%20QG_ch4_1.pdf</a>
The Infill Design Toolkit: Medium Density Residential Development	City of Portland	Strategies for context-sensitive infill development, prototype designs, and neighborhood design policies	<a href="http://www.portlandoregon.gov/bps/49254">http://www.portlandoregon.gov/bps/49254</a>


**LAND USE POLICY**  
*Zoning and Development*  
**2. Walkscore**

Measuring Walkscore can aid municipal planning aimed at improving the health of individuals, communities and the environment.<sup>35</sup>



**Practices and Whom to Contact:**

Strategy Option	Completed	Progress, or Goal by 2015
1. Measure Walkscore at 10 random residential addresses per Census tract, compute average, and improve upon overall score.		Appleton, Bayfield, Fitchburg, Middleton, Weston

**Potential Benefits of Practices:**

Economic impact	Social impact	Environmental impact
<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Walkability is positively related with a higher value for office, retail and apartment properties</li> <li>Improves community public image and encourages investment, increasing the value of a city<sup>36</sup>: investors were willing to pay more for each dollar of income produced by more walkable retail and apartment properties</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Promotes pedestrian mobility</li> <li>Improves health due to increased walking, which lowers individuals' risk of cancers linked to obesity and inactivity<sup>37</sup></li> <li>Increases recreational and aesthetic values</li> </ul>	<p><b>Community</b></p> <ul style="list-style-type: none"> <li>Improves air quality</li> <li>Reduce greenhouse gas emissions from cars</li> </ul>

**Guides:**

Guide	Source	Contents	Link
Walkscore calculator	Walk Score	Calculates the score for a community	<a href="http://www.walkscore.com/">http://www.walkscore.com/</a>

<sup>35</sup> Image from <http://papertreiger.files.wordpress.com/2012/04/walkscore-logo-large-feature.jpg?w=640&h=392&crop=1>

<sup>36</sup> Pivo, Gary, and Jeffrey D. Fisher. 2010. The Walkability Premium in Commercial Real Estate Investments.

<sup>37</sup> World Cancer Research Fund and the American Institute for Cancer Research. (2010). Policy and Action for Cancer Prevention. Washington, D.C.



**LAND USE POLICY**  
*Zoning and Development*

**3. Zoning**

Efforts to promote high-density zoning, such as traditional neighborhood design, high floor-area ration and Smart Codes, encourage walkable neighborhoods and protect natural habitats.<sup>38</sup>



**Practices and Whom to Contact:**

Strategy Options	Completed	Progress, or Goal by 2015
1. Adopt traditional neighborhood design ordinance (If population is less than 12,500).	Fitchburg, Middleton, Weston	Appleton, Bayfield
2. Zoning for office and retail districts permits floor-area ratio > 1, on average.		Appleton, Bayfield, Fitchburg, Middleton, Weston
3. Zoning for office and retail districts requires floor-area ratio > 1, on average.		Bayfield, Middleton
4. Zoning code includes mixed-use districts.	Appleton, Bayfield, Fitchburg, Middleton, Weston	
5. Mixed-use language from Smart Code TBA.	Fitchburg	Appleton, Middleton

**Legacy Community Spotlights:**

**Fitchburg**

- “Adopted Chapter 23 SmartCode District on October 12, 2010,” which works to promote walkable, mixed-use development

**Middleton**

- “Promote open space and conservancy, lands creation of wetlands and prairie, innovative and resourceful community design, compact growth, and preservation of historic downtown”
- Awarded “National Association of Home Builders’ Gold Star Community of the Year” and “Good Neighbor City”

<sup>38</sup> Image from [www.mass.gov/envir/smart\\_growth\\_toolkit/pages/mod-tnd.html](http://www.mass.gov/envir/smart_growth_toolkit/pages/mod-tnd.html)

## Potential Benefits of Practices:

Economic impact	Social impacts	Environmental impacts
<p><b>Municipal Operations</b></p> <ul style="list-style-type: none"> <li>More compact forms of mixed-use development not only consume less land, but also cost less in terms of providing infrastructure and public services than conventional subdivisions<sup>39</sup></li> </ul> <p><b>Community</b></p> <ul style="list-style-type: none"> <li>Traditional Neighborhood Development (TND) saves expenditures of low-income workers who live far from job centers and spend up to 37% of their income on transportation.<sup>40</sup></li> </ul>	<p><b>Municipal Operations</b></p> <ul style="list-style-type: none"> <li>Supports walkable neighborhoods, which create demand for bus and rail transit</li> </ul> <p><b>Community</b></p> <ul style="list-style-type: none"> <li>Enriches residents' life by bringing vibrancy, community and social connection to neighborhoods</li> <li>Brings health benefit with improved living environment and more walking time</li> </ul>	<p><b>Municipal Operations</b></p> <ul style="list-style-type: none"> <li>Improves air quality with decreased travel time</li> </ul> <p><b>Community</b></p> <ul style="list-style-type: none"> <li>Encourages carbon sequestration</li> </ul>

## Guides:

Guide	Source	Contents	Link
SmartCode District Resources	City of Fitchburg	SmartCode presentations, designs, implementation documents, and application checklists	<a href="http://www.city.fitchburg.wi.us/departments/cityHall/planning/SmartCodeResources.php">http://www.city.fitchburg.wi.us/departments/cityHall/planning/SmartCodeResources.php</a>
Model Ordinance for Traditional Neighborhood Development	University of Wisconsin	A model TND ordinance prepared for Wisconsin	<a href="http://urpl.wisc.edu/people/ohm/tndord.pdf">http://urpl.wisc.edu/people/ohm/tndord.pdf</a>
Infill Development Standards and Policy Guide	Rutgers University	Model ordinance with commentary, challenges, best practices solutions	<a href="http://www.state.nj.us/dca/.../2006_6_rev2007_4_infill_dev_stds.pdf">http://www.state.nj.us/dca/.../2006_6_rev2007_4_infill_dev_stds.pdf</a>
Traditional Neighborhood Development Design Rating Standards	EPA	Background on TND, definitions of design standards, methods and scoring	<a href="http://www.epa.gov/smartgrowth/scorecards/TND_Design_Rating_Standards_2.2.pdf">http://www.epa.gov/smartgrowth/scorecards/TND_Design_Rating_Standards_2.2.pdf</a>

<sup>39</sup> Georgia Department of Community Affairs. (2012). *Traditional Neighborhood Development (TND) Model Ordinance and Design Standards*.

<sup>40</sup> University of Wisconsin Extension. (2003). *Economic Benefits of A Walkable Community. Let's Talk Business*, (83). Retrieved from <http://www.uwex.edu/ces/cced/downtowns/lfb/lets/0703lfb.pdf>



LAND USE POLICY  
Natural Resource Management

4. Canopy

Tree preservation improves quality of life, lowers municipal costs, and improves air, water, soil and habitats.



TREE CITY USA®

Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Adopt tree preservation ordinances.		Appleton, Fitchburg, Middleton, Weston
2. Set a tree canopy goal and develop a management plan to achieve it.		Appleton, Fitchburg, Middleton, Weston
3. Require trees to be planted in all new developments.	Appleton, Fitchburg, Middleton	Weston
4. Certification of membership for Tree City USA.	Appleton, Fitchburg, Middleton, Weston	

Legacy Community Spotlights:

**Appleton:**

- Goal to “maintain and expand the urban forest”
- Plans to “promote ‘greening’ and ‘gardening’ within the City”
- Plans to “work with community partners to achieve an urban tree canopy goal of 35%”

**Bayfield:**

- “Named a Tree City USA” in 2001
- Plans to “develop tree planting and cutting ordinances, including provisions for view preservation”

**Middleton:**

- “A Tree City community for the past 17 years, we value the local preservation of the urban forest, its flora and fauna”

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Lower heating and cooling costs due to wind protection and shade</li> <li>• Lower road maintenance costs as tree shading increases the life of asphalt</li> <li>• Lower need for city stormwater controls due to trees causing absorption into soil, decreasing runoff (up to 59%)<sup>41</sup></li> <li>• Lower costs for tree hazard liability, maintenance and pest removal when a long-term management plan is in place</li> <li>• Access to grants, education and resources for members of Tree City USA</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Lower A/C costs (up to 30%)<sup>42</sup> for individuals due to shade of trees in yard</li> <li>• Lower costs of heating (up to 8%)<sup>43</sup> for individuals due to wind protection from trees in yard</li> <li>• Increased property values and rents (by 7-21%)<sup>44</sup></li> <li>• Increased local economic activity: improved retail sales in tree-rich commercial districts (up to 12%).<sup>45</sup></li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Physiological, social and psychological benefits of cleaner air, quieter and shadier streets, aesthetic beauty, and enhanced connection to nature</li> <li>• Improved quality of life due to trees' aesthetics and encouragement of healthy social interaction</li> <li>• Improved pride and empowerment when citizens participate in community forestry efforts</li> <li>• Improved community image due to Tree City USA signs and publicity</li> <li>• Reduced noise pollution as trees absorb sound by 50% or more<sup>46</sup></li> <li>• Deterrent to property crime and violent crime</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Reduced soil pollution as trees contain, degrade and eliminate pesticides, metals, solvents, etc.</li> <li>• Reduced air pollution: one large tree filters 90 lbs. of CO<sub>2</sub>, 3 lbs. of particulates and 4 lbs. of ozone per year</li> <li>• Mitigated heat island effects by shading</li> <li>• Improved groundwater recharging and purification</li> <li>• Improved habitat for local wildlife, including birds and other animals</li> <li>• Protects biodiversity, which helps the ecosystem withstand and recover from various threats</li> <li>• Mitigates climate change due to carbon storage and sequestration</li> </ul>

<sup>41,6</sup> Minnesota Pollution Control Agency. (2012). Best Practice Actions: Urban Forests. *Minnesota GreenStep Cities*. Retrieved December 2, 2012, from <http://greenstep.pca.state.mn.us/bestPracticesDetail.cfm?bpid=16>

<sup>42,2,4,5</sup> American Forests. (2012). Urban Forests – Why We Care. Retrieved December 2, 2012, from <http://www.americanforests.org/our-programs/urbanforests/whywecare/>

## Guides:

Guide	Source	Contents	Link
Tree Protection Ordinance	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p11!71.pdf">http://sustainablejersey.com/editor/doc/p11!71.pdf</a>
Community Forestry Management Plan and Tree Cover Goal	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p11!91.pdf">http://sustainablejersey.com/editor/doc/p11!91.pdf</a>
Tree Planting Programs	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p11!101.pdf">http://www.sustainablejersey.com/editor/doc/p11!101.pdf</a>
Tree Maintenance Programs	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p11!111.pdf">http://www.sustainablejersey.com/editor/doc/p11!111.pdf</a>
Hazard Tree Assessment Program	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p11!121.pdf">http://www.sustainablejersey.com/editor/doc/p11!121.pdf</a>
Computerized Municipal Tree Inventory	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p11!131.pdf">http://sustainablejersey.com/editor/doc/p11!131.pdf</a>
i-Tree Tools	USDA Forest Service	State-of-the art, peer-reviewed software suite of community forestry analysis and benefits assessment tools	<a href="http://www.itreetools.org/applications.php">http://www.itreetools.org/applications.php</a>
Tree City USA Application Resources	Arbor Day Foundation	Sample ordinances, checklists, budget worksheet, bulletins and applications to become a Tree City USA	<a href="http://www.arborday.org/programs/treeCityUSA/apply.cfm">http://www.arborday.org/programs/treeCityUSA/apply.cfm</a>
City Trees – Sustainability Guidelines and Best Practices	MN Tree Trust, Bonestroo	City tree development plan, design implementation and surface conditions, improving air & water quality, increasing shade, tree maintenance	<a href="http://actrees.org/files/Research/sustainable_citytrees.pdf">http://actrees.org/files/Research/sustainable_citytrees.pdf</a>



## 5. Mowing

Reducing mowing saves fuel, person-hours and natural vegetation.<sup>47</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Local government establishes rights of way to be mowed or cleared only for safe sightlines and/or to remove invasive species.	Middleton	Appleton, Bayfield, Fitchburg, Weston

### Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>Reduces fuel costs</li> <li>Allows distribution of person-hours to other projects</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Value of reduced air pollution from burning fossil fuels on healthcare costs</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Keeps beautiful trees and plants in neighborhood and on streets where possible</li> <li>Prevents allergens from being kicked into the air</li> <li>Maintains natural beauty of the city</li> </ul>	<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>Conserves fuel resources that go into mowing</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Decreases air pollution and CO<sub>2</sub> emissions that enhance global warming</li> <li>Slows the spread of invasive species in fragile roadside areas</li> <li>Promotes healthy growth of natural vegetation</li> </ul>

### Guides:

Guide	Source	Contents	Link
Woody Vegetation Management	North Carolina Department of Transportation	Provides options for management of woody vegetation on roadways, including invasive species	<a href="http://www.ncdot.gov/doh/operations/dp_chi_ef_eng/roadside/vegetation/maintenance/woody.html">http://www.ncdot.gov/doh/operations/dp_chi_ef_eng/roadside/vegetation/maintenance/woody.html</a>

<sup>47</sup> Image from [http://2.bp.blogspot.com/-eS1YA7BITYk/UGbw19\\_j4MI/AAAAAAAAAGTY/dD8MFe9htag/s1600/how-to-mow-your-lawn-1.jpg](http://2.bp.blogspot.com/-eS1YA7BITYk/UGbw19_j4MI/AAAAAAAAAGTY/dD8MFe9htag/s1600/how-to-mow-your-lawn-1.jpg)



LAND USE POLICY  
*Natural Resource Management*

**6. Water Protection**

Efforts to monitor and preserve wetlands protect a community’s natural resources and offer a number of economic, social and environmental returns.<sup>48</sup>



**Practices and Whom to Contact:**

Strategy Option	Completed	Progress, or Goal by 2015
1. Establish 75-foot natural vegetation zone easement from surface water.	Appleton, Fitchburg, Middleton, Weston	
2. Create an inventory of wetlands and insure no net annual loss.		Appleton, Bayfield, Fitchburg, Middleton, Weston

**Legacy Community Spotlights:**

**Weston:**

- “Protection for the 30% of the community that is wetlands”

**Potential Benefits of Practices:**

Economic impact	Social impact	Environmental impact
<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• High return on investment: in Colorado a \$595 million investment in conservation easements returned \$3.51 billion in public benefits, a return of \$6 for every \$1 invested.<sup>49</sup></li> <li>• Volunteer efforts can keep costs low</li> <li>• Increases agricultural production</li> <li>• Increases property values</li> <li>• Possibly increases tourism</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Increase recreational values (hunting, fishing, hiking, wildlife watching, etc.) and aesthetic values</li> </ul>	<p><b>Community</b></p> <ul style="list-style-type: none"> <li>• Protects and secures water supply</li> <li>• Provides flood control</li> <li>• Provides fish and wildlife habitat</li> <li>• Dilutes waste water</li> <li>• Provides erosion control</li> <li>• Encourages carbon sequestration</li> </ul>

<sup>48</sup> Image from <http://www.wisconsinwetlands.org/photo/RenakPolakWoods-JoyWolf.jpg>

<sup>49</sup> The Trust for Public Land. (2010.) *A Return on Investment: The Economic Value of Colorado’s Conservation Easements*. Retrieved from <http://cloud.tpl.org/pubs/benefits-CO-easements-taxcredit.pdf>

## Guides:

Guide	Source	Contents	Link
Easement Inventory and Outreach	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/actiondesc.php?arr_num=75&amp;id_num=11!21">http://www.sustainablejersey.com/actiondesc.php?arr_num=75&amp;id_num=11!21</a>
Easement Inspections and Evaluations	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/actiondesc.php?arr_num=76&amp;id_num=11!22">http://www.sustainablejersey.com/actiondesc.php?arr_num=76&amp;id_num=11!22</a>



ENERGY  
*Community Energy Use*

# 1. Community Energy Use Policies

Efforts to encourage residents to make their energy use cleaner or more efficient reduces fossil fuel consumption, leading to environmental benefits and long-term cost savings.<sup>50</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Use PACE Financing		Bayfield
2. Make Watt meters available to the public	Appleton, Bayfield, Fitchburg, Middleton, Weston	
3. Adopt a Residential Energy Conservation Ordinance (time-of-sale certification and upgrades).		

### Legacy Community Spotlights:

#### Bayfield

- Initiated "Clean It Green It" project in 2008, in which they “provided each household in the City with... a CFL”

<sup>50</sup> Image from [http://media.mwcradio.com/mimesis/2011-01/02/solar\\_jpg\\_475x310\\_q85.jpg](http://media.mwcradio.com/mimesis/2011-01/02/solar_jpg_475x310_q85.jpg)

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>Potentially lowers baseline energy generation at power plant</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Increases awareness of power usage and costs in the home<sup>51</sup></li> <li>PACE financing may incentivize energy upgrades</li> <li>Potential for residents to sell energy back to the grid</li> <li>Value of reduced air pollution from burning fossil fuels on healthcare costs</li> </ul>	<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>Pride in clean energy usage</li> <li>Serve as an example to other communities that may be looking to implement clean energy</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>Reduced respiratory problems linked to burning fossil fuels</li> </ul>	<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>Reduces power plant emissions in the air of the community</li> <li>Decreases air pollution and CO<sub>2</sub> emissions that enhance global warming</li> <li>Conserves fossil fuel resources</li> </ul>

## Guides:

Guide	Source	Contents	Link
Madison Gas & Electric Library Partnership (Watt Meters)	Madison Gas & Electric	Information about Watt meters available at Madison-area public libraries	<a href="http://www.mge.com/about/library.htm">http://www.mge.com/about/library.htm</a>

<sup>51</sup>Wisconsin Focus on Energy. (2007). *Are your appliances wasting energy?: Fact Sheet*. Retrieved from [http://www.focusonenergy.com/files/Document\\_Management\\_System/Residential\\_Programs/R\\_PI\\_MKFS\\_WattMeterEnergyUseFS0207.pdf](http://www.focusonenergy.com/files/Document_Management_System/Residential_Programs/R_PI_MKFS_WattMeterEnergyUseFS0207.pdf)



## 2. Measuring Community Energy Use

Calculating annual electricity and natural gas consumption for a municipality is a step that can aid in making decisions in regards to future energy use; increased energy independence has vast economic, social and environmental impacts.<sup>52</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Work with local utility companies to calculate total electricity and natural gas consumption annually, beginning with the fifth year before entering the program.	Appleton, Bayfield, Fitchburg,	Middleton, Weston
2. Become established as an Energy Independence Community (EIC).	Appleton, Bayfield, Fitchburg, Middleton	

### Legacy Community Spotlights:

#### Appleton:

- “Energy Independence Community”
- Target: “By 2025, energy consumption (electricity, natural gas, motor fuels) per capita for the Appleton community will be reduced by 25% relative to 2005.”

#### Bayfield:

- “Continuing to be a WI Energy Independent Community”

<sup>52</sup> Image from: [www.stateenergyoffice.wi.gov/section.asp?linkid=1514&locid=160](http://www.stateenergyoffice.wi.gov/section.asp?linkid=1514&locid=160)

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Greater availability of state/federal funding</li> <li>• Reduces need for fossil fuels</li> <li>• Reduced energy costs, especially over the long-term</li> <li>• Cost security in providing own energy instead of buying it from the market</li> </ul>	<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Increased support for renewables</li> <li>• Reduced times for planning and construction compared to conventional energy plants</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Community engagement in lowering their carbon footprint that contributes to climate change</li> <li>• Reduced burning of fossil fuels may help people with asthma or allergies</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Renewable energy sources such as wind, solar, and geothermal have negligible emissions of air pollutants and greenhouse gases</li> <li>• Mitigates climate change</li> </ul>

## Guides:

Guide	Source	Contents	Link
Energy Independent Communities Tool	Energy Center of Wisconsin	Microsoft Excel worksheet that allows communities to calculate various aspects of energy use, and determine the effects of changes in source or efficiency	<a href="http://www.ecw.org/project.php?workid=2&amp;resultid=458">http://www.ecw.org/project.php?workid=2&amp;resultid=458</a>

## ENERGY

### *Municipal Energy Use*



## 3. Government Energy Use Policies

Efforts to improve government energy efficiency, especially in the areas of lighting, fuel and green buildings, offer significant cost savings, safety benefits and environmental conservation.<sup>53</sup>



### Practices and Whom to Contact:

Strategy Option (Points)	Completed	Progress, or Goal by 2015
1. Include transportation energy/emissions as criterion in RFPs for purchases of goods over \$10,000.		Appleton, Bayfield
2. Develop list of lighting, HVAC and shell improvements to raise Energy Star Portfolio Manager or LEED EBO&M score	Appleton	Bayfield, Fitchburg, Middleton, Weston
3. Reduce motor fuels use for non-transit activities	Bayfield	Appleton, Fitchburg, Middleton, Weston
4. Provide transit passes at 50% or more off the regular price and/or provide parking cash-out options for local government employees.		
5. Streetlights operate at 75 lumens/Watt or higher	Appleton, Bayfield, Fitchburg, Middleton, Weston	
6. Stoplights are LEED or functional equivalent	Appleton, Bayfield, Fitchburg, Middleton, Weston	
7. Municipal electricity purchases are at least 5 percentage points higher in renewable content than the statewide renewable portfolio standard requires. Calculation may include self-generated power and purchased offsets.		Appleton, Bayfield, Fitchburg, Middleton, Weston

<sup>53</sup> Image from [http://greentiercommunities.org/?page\\_id=67](http://greentiercommunities.org/?page_id=67)

## **Legacy Community Spotlights:**

### **Appleton**

- “Developed a 5-year replacement plan for HVAC equipment replacements and upgrades of aging equipment. Equipment is replaced with energy efficiency and life-cycle cost justifications during purchase.”
- “Began installing white roofs and using light colored ballast as a sustainability initiative to reflect heat away from facilities during cooling months.”
- “Lighting upgrades performed, which commenced in 2006, account for a projected reduction of 1.6 million kWh.”
- “Retro commission of the Wastewater Plant and Library reduced electrical usage by 102,000 kWh and 54,000 therms annually”

### **Fitchburg:**

- Implemented “eco-friendly streetlight modifications”
- Installed solar thermal panels on City Hall's roof, and “helped the initiative to install a geothermal heat pump that makes the use of natural gas obsolete”

### **Middleton:**

- “Numerous environmental initiatives such as converting traffic signals to LED lighting, or installing occupant sensors for lighting in City facilities.”

### **Weston:**

- “Dark skies community” committed to reducing “night sky light pollution”
- “A \$140 million dollar medical complex became the first major project to meet the no greater than one candlelight at the property line ordinance that has left Weston’s night skies unadulterated”

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations</i></b></p> <ul style="list-style-type: none"> <li>• Advances in lighting, signal and intersection technologies provide better quality and safer lighting for lower costs and energy usage with short capital payback periods (2 to 7 years)<sup>1</sup></li> <li>• Replacing inefficient lights with new technologies can save 50-70 % of the original energy consumption<sup>54</sup></li> <li>• New street and road lighting technology reduces energy consumption up to 60%<sup>55</sup></li> <li>• New lighting technologies require less maintenance, freeing human resources for other projects</li> <li>• Resource-efficient buildings place less demand on infrastructure for potable water, sewage conveyance, and power generation</li> <li>• Green fleets reduce road and parking facility costs</li> </ul>	<p><b><i>Municipal Operations</i></b></p> <ul style="list-style-type: none"> <li>• Less exposure of maintenance staff to traffic due to longer-lasting street lighting</li> <li>• New lighting technology reduces risk and liability</li> <li>• Integrated green design strategies reduce the risk of sick building syndrome and minimize callbacks<sup>56</sup></li> <li>• Incentivizing transit use for municipal employees reduces congestion and traffic accidents, and offers speed, convenience and cost savings</li> </ul> <p><b><i>Community</i></b></p> <ul style="list-style-type: none"> <li>• LED lamps are much brighter than incandescent lamps, with a much lower chance of lamp failure</li> <li>• New street lighting provides better quality light and reduces over-lighting and glare that may prevent motorists from seeing other vehicles or pedestrians</li> <li>• Green buildings improve air quality and thermal control, and typically have 27% higher occupant satisfaction<sup>57</sup> and productivity</li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Exterior lighting for buildings, parking lots, city streets and traffic signals can contribute up to 25% of a city's operational carbon footprint<sup>58</sup></li> <li>• Energy efficient light structures reduce light pollution and greenhouse gas emissions, up to 512,120 tons over 20 years<sup>59</sup></li> <li>• Sustainably designed green buildings result in less wind/water erosion and sedimentation of waterways during construction and permanently reduce stormwater runoff and watershed pollution</li> <li>• Improved air quality due to green buildings</li> <li>• Transit-oriented communities drive 20-40% fewer annual miles, reducing pollution and habitat degradation</li> </ul>

<sup>54</sup> Intelligent Energy Europe. (2007). *Guide for energy efficient street lighting installations*. Retrieved from [http://www.e-streetlight.com/Documents/Homepage/0\\_3\\_Guide\\_For\\_EE\\_Street\\_Lighting.pdf](http://www.e-streetlight.com/Documents/Homepage/0_3_Guide_For_EE_Street_Lighting.pdf)

<sup>55</sup> Schoenecker, T. (2009). LED Traffic Signals: Washington County Case Study. Retrieved from <http://www.nextstep.state.mn.us/energyconference/090122schoenecker.pdf>

<sup>56</sup> Minnesota Pollution Control Agency. (2012). Green building. Retrieved December 3, 2012, from <http://www.pca.state.mn.us/index.php/topics/preventing-waste-and-pollution/green-building/index.html>

<sup>57</sup> U.S. Green Building Council. (2011). *Roadmap to Green Government Buildings*. Retrieved from <http://www.usgbc.org/ShowFile.aspx?DocumentID=5486>

<sup>58</sup> Minnesota Pollution Control Agency. Efficient Building & Street Lighting and Signals. 2012. Retrieved December 3, 2012, from <http://greenstep.pca.state.mn.us/bestPracticesDetail.cfm?bpid=4>

<sup>59</sup> Intelligent Energy Europe. (2007). *Guide for energy efficient street lighting installations*.

## Guides:

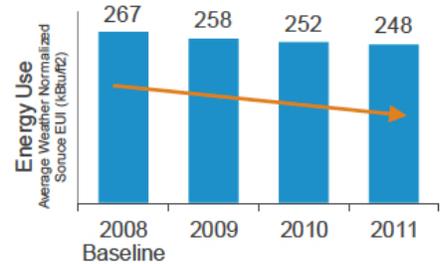
Guide	Source	Contents	Link
High Performance Building	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p3!31.pdf">http://www.sustainablejersey.com/editor/doc/p3!31.pdf</a>
High Performance Building Portfolio	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p3!41.pdf">http://www.sustainablejersey.com/editor/doc/p3!41.pdf</a>
Adopt a Green Building Policy Resolution	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p5!11.pdf">http://www.sustainablejersey.com/editor/doc/p5!11.pdf</a>
Green Design Municipal Buildings – New Construction	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p5!61.pdf">http://www.sustainablejersey.com/editor/doc/p5!61.pdf</a>
Green Design Municipal Buildings – Upgrade/Retrofit – Light Pollution	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p5!81.pdf">http://www.sustainablejersey.com/editor/doc/p5!81.pdf</a>
Purchase Energy Efficient Appliances or Equipment for Municipal Use	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p12!51.pdf">http://sustainablejersey.com/editor/doc/p12!51.pdf</a>
Energy Efficient Traffic Signals and Streetlights	Delaware Valley Regional Planning Commission	Overview of streetlight and traffic signal retrofits, additional resources, funding opportunities	<a href="http://www.dvrpc.org/reports/MIT020.pdf">www.dvrpc.org/reports/MIT020.pdf</a>
Wisconsin Renewable Portfolio Standard	Public Service Commission of Wisconsin	Overview of WI renewable portfolio standard and link to fill out renewable facility registration report	<a href="http://psc.wi.gov/utilityInfo/electric/renewableResource.htm">http://psc.wi.gov/utilityInfo/electric/renewableResource.htm</a>



**ENERGY**  
*Community Energy Use*

## 4. Measuring Government Energy Use

Efforts to calculate government energy use, such as fleet use of motor fuels or LEED and ENERGY STAR scores for buildings, help members maximize efficiency and minimize environmental impact.<sup>60</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Complete EPA Energy Star Portfolio Manager spreadsheet for government energy use. Or, score existing buildings with LEED EBO&M.		Appleton, Bayfield, Fitchburg, Middleton, Weston
2. Calculate annual government fleet use of motor fuels, in gallons of petroleum and biofuels, beginning with the fifth year before entering the program.	Bayfield	Appleton, Fitchburg, Middleton, Weston
3. All new and renovated municipal buildings must meet LEED Silver or greater.		Appleton, Bayfield, Fitchburg, Weston

### Legacy Community Spotlights:

#### Appleton

- Installed “a networked computerized Energy Management and Control System in 14 of the largest buildings. Buildings can be monitored, controlled and scheduled from a single location or from remote locations.”

#### Fitchburg

- “Prompted the new Fitchburg Public Library to seek LEED-Gold certification”

<sup>60</sup> Image from <http://www.energymanagertoday.com/buildings-using-energy-star-portfolio-manager-realized-total-savings-of-7-086348/>

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations</i></b></p> <ul style="list-style-type: none"> <li>Green buildings have 13% lower maintenance costs,<sup>61</sup> and reduce staff-related overhead and relocation costs.</li> </ul>	<p><b><i>Municipal Operations</i></b></p> <ul style="list-style-type: none"> <li>With improved air quality, greater thermal control, and other indoor environmental quality, green buildings typically have 27% higher occupant satisfaction<sup>62</sup></li> <li>Greater satisfaction from workers in the building often leads to increased productivity and morale, and reduced absenteeism.</li> </ul>	<p><b><i>Municipal Operations</i></b></p> <ul style="list-style-type: none"> <li>An ENERGY STAR qualified building in each of the 26 eGRID sub-regions emits at least 26% less carbon than a typical office building.<sup>63</sup></li> <li>Many LEED buildings save 30-50% water and energy use than current codes.<sup>64</sup></li> <li>Improving fuel efficiency reduces carbon emission</li> </ul>

<sup>61</sup> Roadmap to Green Government Buildings. U.S. Green Building Council. Retrieved from <http://www.usgbc.org/ShowFile.aspx?DocumentID=5486>

<sup>62</sup> Ibid.

<sup>63</sup> Carbon Emissions from Building Energy Use. Energy Star. Retrieved from [http://www.energystar.gov/index.cfm?c=evaluate\\_performance.bus\\_portfoliomanager\\_carbon](http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager_carbon)

<sup>64</sup> What is Green Building? James City County. Retrieved from <http://www.jamescitycountyva.gov/greencommunity/what-is.html>

## Guides:

Guide	Source	Contents	Link
Energy Tracking and Management	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p3!51.pdf">http://sustainablejersey.com/editor/doc/p3!51.pdf</a>
Energy Audits for One Building	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p3!11.pdf">http://www.sustainablejersey.com/editor/doc/p3!11.pdf</a>
Inventory and Audit All Buildings	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p3!21.pdf">http://sustainablejersey.com/editor/doc/p3!21.pdf</a>
Municipal Carbon Footprint	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p4%2111.pdf">http://sustainablejersey.com/editor/doc/p4%2111.pdf</a>
Carbon and Petroleum Footprint Calculator	U.S. Department of Energy	Calculator for measuring the petroleum displacement and greenhouse gas (GHG) emissions of medium- and heavy-duty vehicles and off-road equipment.	<a href="http://greet.es.anl.gov/carbon_footprint_calculator">http://greet.es.anl.gov/carbon_footprint_calculator</a>
Fleet Greenhouse Gas Emissions calculator	Environmental Defense Fund	Tools to help fleet managers set emissions goals, track progress, and report results	<a href="http://business.edf.org/projects/fleet-vehicles/fleet-calculator">http://business.edf.org/projects/fleet-vehicles/fleet-calculator</a>
EPA ENERGY STAR Building Manual Guide	EPA	Step-by-step guidance based on the five stages of implementation	<a href="http://www.energystar.gov/index.cfm?c=business.bus_upgrade_manual">http://www.energystar.gov/index.cfm?c=business.bus_upgrade_manual</a>



**WATER**  
*Water Use Conservation*

## 1. Water Conservation

Efforts that encourage your community to conserve water offer cost savings, protect the value of ecosystem services, ensure clean water for all residents and reduces negative impacts on the local watershed.<sup>65</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Track water and sewer use annually, beginning with the fifth year before entering the program, and develop plan for reductions.	Bayfield	Appleton, Fitchburg, Middleton, Weston
2. Develop a water loss control plan with targets below the 15% required by the state and include a system-wide water audit implementation and timetable.	Appleton, Bayfield, Fitchburg	Middleton, Weston
3. Join EPA's WaterSense Program for water utilities or the Groundwater Guardian Green Sites program and promote them to local business.	Appleton, Fitchburg	Bayfield, Middleton, Weston
4. Use block rates and flat rates to encourage water conservation among residential, commercial, and industrial users.	Weston	Appleton, Bayfield, Fitchburg, Middleton
5. Financial assistance for sewer lateral replacements.		Bayfield, Weston
6. Upgrade water utility equipment (e.g., variable frequency drive motors) to achieve energy efficiency.	Appleton, Fitchburg	Bayfield, Middleton, Weston
7. Infiltration and inflow reduction by 10%.	Appleton, Bayfield, Fitchburg, Middleton	
8. Wastewater biogas captured and used in operations.	Appleton	Fitchburg, Middleton
9. Plan for replacing all toilets using > 1.6 gpf and annual progress sufficient to reach 90 percent replacement in 10 years.		Appleton, Bayfield, Fitchburg, Weston

<sup>65</sup> Image from <http://www.pfisterfaucets.com/Images/DesignCenterBlog/RebuildingTogether/EasyEnergyEff/epa-watersense-logo-image.jpg>

## **Legacy Community Spotlights:**

### **Appleton:**

- “Develop a program for rainwater harvesting for residential properties”

### **Bayfield:**

- “Our Clean It Green It project for 2011 is based on informing our residents and visitors on the importance of water conservation.”
- “Achieved Bronze Water Star designation”

### **Fitchburg:**

- “The Water and Sanitary Sewer Utilities continued the toilet rebate program in 2011 to encourage replacement of high gallon per flush toilets with Water Sense approved models to promote water conservation.”

### **Middleton:**

- “Reviewed the City’s water rate structure and eliminated the incentive for residential customers to use large volumes of water by implementing a flat-rate structure”

### **Weston:**

- “Conducted a ‘How to Build a Rain Barrel’ workshop for about 75 residents and water utility customers. Everyone in attendance received a free 55 gallon barrel, courtesy of the water utility, to build their own rain barrel at home.”

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Savings on water utility costs through efficiency upgrades</li> <li>• Wastewater biogas capture could save on energy costs.<sup>66</sup></li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Water cost savings for those who use less water, especially with inverted block pricing<sup>67</sup></li> <li>• Value of ecosystem services protected by conserving water</li> </ul>	<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Pride in clean and safe water supply</li> <li>• Promote value of water efficiency<sup>68</sup></li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Ensures that safe drinking water is available to all residents</li> <li>• People may use public supply for drinking water instead of bottled water</li> <li>• Decreases in water-borne illnesses</li> <li>• Serves as an example for other communities</li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Improved local wildlife areas by maintenance of water flow through ecosystems</li> <li>• Decreased impacts on aquatic ecosystems through reduced water takings</li> </ul>

<sup>66</sup> Massachusetts Department of Environmental Protection. (2004). Energy Fact Sheet: Biogas Production.

<sup>67</sup> Texas Water Development Board Study. (2002). Quantifying the Effectiveness of Various Water Conservation Techniques in Texas.

<sup>68</sup> United States Environmental Protection Agency. (2012). What is WaterSense?

**Guides:**

<b>Guide</b>	<b>Source</b>	<b>Contents</b>	<b>Link</b>
Water Conservation Ordinance	Sustainable Jersey	Costs, timeframe, and specific steps to put a water conservation ordinance in place.	<a href="http://www.sustainablejersey.com/actiondesc.php?arr_num=91&amp;id_num=11!15">http://www.sustainablejersey.com/actiondesc.php?arr_num=91&amp;id_num=11!15</a>
Water Conservation Education Program	Sustainable Jersey	Overview and implementation steps for a water conservation program, case studies	<a href="http://www.sustainablejersey.com/actiondesc.php?arr_num=90&amp;id_num=11!14">www.sustainablejersey.com/actiondesc.php?arr_num=90&amp;id_num=11!14</a>
Water Efficiency Programs and Projects	Minnesota GreenStep	Links to reports on improving efficiency of pretreatment, cogeneration, and water reuse, cost savings, case studies	<a href="http://greenstep.pca.state.mn.us/bestPracticesDetail_actions.cfm?bpid=20&amp;aid=834">http://greenstep.pca.state.mn.us/bestPracticesDetail_actions.cfm?bpid=20&amp;aid=834</a>
Decrease Inflow and Infiltration	Minnesota GreenStep	Implementation tools, cost savings, and case studies	<a href="http://greenstep.pca.state.mn.us/bestPracticesDetail_actions.cfm?bpid=20&amp;aid=831">http://greenstep.pca.state.mn.us/bestPracticesDetail_actions.cfm?bpid=20&amp;aid=831</a>



**WATER**  
*Water Use Conservation*

**2. Local Government Use**

Efforts to conserve water in the course of municipal operations provide economic savings and environmental benefits, while serving as an example to the community.<sup>69</sup>



**Practices and Whom to Contact:**

Strategy Option	Completed	Progress, or Goal by 2015
1. Install waterless urinals in men's restrooms at municipal facilities (city hall, parks, etc.).		Appleton, Bayfield, Fitchburg, Weston
2. All outdoor watering by local government, excluding parks and golf courses, from rain collection.	Middleton	Appleton, Bayfield, Fitchburg, Weston
3. Develop a water efficiency and conservation plan for municipal buildings.		Appleton, Bayfield, Fitchburg, Middleton, Weston

**Legacy Community Spotlights:**

**Middleton:**

- "Staff has identified water saving fixtures for City Hall bathrooms and these were budgeted for 2012"

<sup>69</sup> Image from <http://sfpl.org/images/libraries/merced/vtour/water.jpg>

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Savings on water costs for city with conservation and efficiency measures</li> <li>• Reduce expansion of water and wastewater systems<sup>70</sup></li> <li>• Increased water efficiency may lead to expansion of industries in water-using sectors</li> <li>• May bring about job creation<sup>2</sup></li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Value of ecosystem services protected by conserving water</li> </ul>	<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Neighborhood social cohesion can arise from pride in clean and safe water supply</li> <li>• Demonstrate to residents a commitment to water conservation</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• May serve as an example for other communities looking to implement water conservation measures</li> </ul>	<p><b>Municipal Operations:</b></p> <ul style="list-style-type: none"> <li>• Improved local wildlife areas by maintenance of water flow through ecosystems</li> </ul> <p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Decreased impacts on aquatic ecosystems through reduced water takings</li> </ul>

## Guides:

Guide	Source	Contents	Link
Municipal Buildings Upgrade/Retrofit – Water Conservation	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p5!71.pdf">http://sustainablejersey.com/editor/doc/p5!71.pdf</a>
Grounds and Maintenance: Minimize Water Consumption	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://www.sustainablejersey.com/editor/doc/p12!91.pdf">http://www.sustainablejersey.com/editor/doc/p12!91.pdf</a>

<sup>70</sup> National Action Plan to Encourage Municipal Water Use Efficiency: CCME Water Use Efficiency Task Group. (2011).



### **3. Stormwater Management**

Encourage the use of best management practices to achieve a reduction in the amount of harmful pollutants introduced to our streams, rivers, and lakes.<sup>71</sup>



#### **Practices and Whom to Contact:**

<b>Strategy Option</b>	<b>Completed</b>	<b>Progress, or Goal by 2015</b>
1. Develop a regular street sweeping program to reduce total suspended solids.	Appleton, Bayfield, Fitchburg, Middleton	Weston
2. Stormwater utility fees offer credits for best management practices such as rain barrels, rain gardens, and pervious paving.	Appleton, Fitchburg, Middleton	Weston
3. Inventory all paved surfaces (e.g., by GIS mapping), and develop a plan for reduction.	Appleton, Bayfield, Fitchburg	Middleton, Weston
4. Work with commercial or light industrial businesses to develop stormwater pollution plans.	Bayfield	Appleton, Fitchburg, Weston

<sup>71</sup> Image from <http://dnr.wi.gov/topic/stormwater/images/Picture320.jpg>

## Legacy Community Spotlights:

### Bayfield:

- "Improvements to a large storm sewer discharge ... were added to reduce sedimentation and improve water clarity after large rain events."

### Fitchburg:

- "Stormwater identification and informational signage designed and ordered"

### Middleton:

- "All public and private users limit their use of groundwater while also seeking to maximize infiltration of stormwater so that there is equilibrium between water used and water returned to the ground."

### Weston:

- "Created a Stormwater Utility in 2004 that provides for credits to be achieved through the use of onsite storage and/or reuse of rain water"
- "Weston Water and Stormwater Utilities conducts annual Rain Garden and Rain Barrel workshops/presentations to promote rainwater harvesting and reduced reliance on the water utility for irrigation water. The water utility offers one barrel free of charge to utility customers."

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Potential savings by preventing flood damages</li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Value of ecosystem services protected by conserving water</li> </ul>	<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Can help to prevent flooding in prone areas</li> <li>• Reduces runoff on paved surfaces<sup>72</sup></li> </ul>	<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>• Prevent pollution from storm runoff in ecologically sensitive areas</li> <li>• Improve efforts to monitor and clean up stormwater pollution<sup>73</sup></li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>• Decreased impacts on aquatic ecosystems by runoff from storm events</li> </ul>

<sup>72</sup> Hunt, William F. and Kelly A Collins. NC Cooperative Extension. (2008). Permeable Pavement: Research Update and Design Implications.

<sup>73</sup> Wisconsin Department of Natural Resources. Sample Stormwater Pollution Prevention Permit.

**Guides:**

<b>Guide</b>	<b>Source</b>	<b>Contents</b>	<b>Link</b>
Raingarden Demonstration Project	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p15!51.pdf">http://sustainablejersey.com/editor/doc/p15!51.pdf</a>
Green Roofs Demonstration Project	Sustainable Jersey	What, who, timeframe, project costs, resource needs, why important, how to, spotlight, resources	<a href="http://sustainablejersey.com/editor/doc/p15!42.pdf">http://sustainablejersey.com/editor/doc/p15!42.pdf</a>
Efficient Stormwater Management	Minnesota GreenStep	Provides information on implementation tools, example communities, and potential benefits of practices to improve stormwater management.	<a href="http://greenstep.pca.state.mn.us/bestPracticesDetail_actions.cfm?bpid=17&amp;aid=815">http://greenstep.pca.state.mn.us/bestPracticesDetail_actions.cfm?bpid=17&amp;aid=815</a>
Porous Asphalt Pavement	U.S. EPA	Gives specifications, design criteria, and maintenance information in addition to noting limitations to applicability.	<a href="http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&amp;Rbutton=detail&amp;bmp=135">http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=browse&amp;Rbutton=detail&amp;bmp=135</a>



**WATER**  
*Water and Development*

## 4. Land Development

By using green infrastructure, communities may maintain healthy waters, gain multiple environmental benefits and support sustainable communities.<sup>74</sup>



### Practices and Whom to Contact:

Strategy Option	Completed	Progress, or Goal by 2015
1. Identify key green infrastructure areas during plan development and/or implement a plan to acquire and protect key green infrastructure areas	Appleton, Bayfield, Fitchburg, Middleton	Weston

### Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Lowers upfront and maintenance cost compared with using pipes</li> <li>• Positive effect on housing prices</li> <li>• Increases commercial square footage</li> </ul>	<p><b>Community:</b></p> <ul style="list-style-type: none"> <li>• Increases recreational values and aesthetic values</li> </ul>	<p><b>Community</b></p> <ul style="list-style-type: none"> <li>• Air and water quality management</li> <li>• Flood control</li> <li>• Provides fish and wildlife habitat</li> <li>• Erosion control</li> <li>• Thermal pollution reduction</li> <li>• Encourages carbon sequestration</li> </ul>

<sup>74</sup> Image from [http://www.waterworld.com/content/dam/etc/medialib/platform-7/waterworld/articles/print-articles/volume-27/issue-2/51322.res/\\_jcr\\_content/renditions/pennwell.web.400.263.jpg](http://www.waterworld.com/content/dam/etc/medialib/platform-7/waterworld/articles/print-articles/volume-27/issue-2/51322.res/_jcr_content/renditions/pennwell.web.400.263.jpg)

## Guides:

Guide	Source	Contents	Link
Water: Green infrastructure	EPA	Tools, case studies, funding opportunities	<a href="http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm">http://water.epa.gov/infrastructure/greeninfrastructure/index.cfm</a>
Stormwater management	MN GreenStep	Specific stormwater infiltration/reuse techniques, tools and benefits	<a href="http://greenstep.pca.state.mn.us/bestPracticesDetail.cfm?bpid=17">http://greenstep.pca.state.mn.us/bestPracticesDetail.cfm?bpid=17</a>
Value of Infrastructure Study	Center for Neighborhood Technology & American Rivers	Framework to help communities measure and value in dollars the stormwater, air quality, energy, and other benefits that green stormwater infrastructure provides.	<a href="http://www.americanrivers.org/library/reports-publications/going-green-to-save-green.html">http://www.americanrivers.org/library/reports-publications/going-green-to-save-green.html</a>

**WASTE**  
*Waste Management and Reduction*



# 1. Waste Management and Reduction

Efforts to reduce waste provide savings for municipal operations and residents, promote a higher quality of life and community participation in sustainability, and protect natural resources and environmental health.<sup>75</sup>



**Practices and Whom to Contact:**

Strategy Option	Completed	Progress, or Goal by 2015
1. Community waste stream monitored at least annually. Waste reduction plan prepared and updated annually.	Appleton, Fitchburg, Middleton	Bayfield, Weston
2. Waste and materials management plan based on “zero-waste” principles, with specific goals, prepared and updated annually.		Appleton, Bayfield, Fitchburg, Middleton, Weston
3. Construction/deconstruction waste recycling ordinance.		Appleton, Bayfield, Fitchburg, Middleton, Weston
4. Mandatory residential curbside recycling pickup that covers paper, metal cans, glass and plastic bottles	Appleton, Bayfield, Fitchburg, Middleton, Weston	
5. Develop a municipal collection program that encourages the diversion of food discards, yard materials, and other organics from landfills to composting or anaerobic digestion with energy recovery		Appleton, Bayfield, Fitchburg, Middleton, Weston
6. Develop and promote programs that dispose of household hazardous, medical, and electronic waste	Appleton, Bayfield, Fitchburg, Middleton, Weston	
7. Use anaerobic digesters to process organic waste and produce energy		Appleton, Fitchburg

<sup>75</sup> Image from <http://static.ddmcdn.com/gif/composting-input.jpg>

Strategy Option ( <i>continued</i> )	Completed	Progress, or Goal by 2015
8. Implement municipal ordinances requiring manufacturer takeback for fluorescent bulbs, thermostats and other mercury-containing devices.		Appleton, Bayfield, Fitchburg
9. Ordinances in place to reduce the usage of phone books as well as single-use shopping bags, Styrofoam food containers and other disposable packaging.		Appleton, Bayfield, Fitchburg, Middleton
10. Pay-as-you-throw system implemented by municipality or required of private waste haulers.	Appleton, Fitchburg	Bayfield, Middleton, Weston
11. Use public education and outreach to promote recycling, backyard composting, product re-use and waste reduction	Appleton, Bayfield, Middleton, Weston	

## Legacy Community Spotlights:

### Appleton:

- “Increase fees for 35, 60, and 90 gallon residential refuse containers”
- “Work with stakeholders to maximize landfill diversion given reasonable cost effectiveness of constraints”
- “Develop, implement, and enforce a construction and demolition waste ordinance”
- “Work with stakeholders to investigate the potential to recycle other plastics not currently collected curbside (i.e. #5, most prevalent)”

### Bayfield:

- "Bayfield Earth Care Guide" offers residents information on reuse, recycling, and composting

### Fitchburg

- “Under the Refuse Tag program, households may purchase Refuse tags which allows you to dispose of additional refuse that does not fit into the refuse cart”<sup>76</sup>
- “Solid Waste & Recycling Ordinance - New section for Construction and Demolition Reuse and Recycling requirements”
- “Recycling Guide updated”

### Middleton:

- “Measuring the amount of material disposed, the amount of which is recycled, and the proper disposal of hazardous material”
- “Continues to update the Trash & Recycling Guide for waste management”
- “Researched construction waste recycling efforts... and is [working on] a final construction & demolition ordinance, which requires that 100% of recyclable materials from roofing and siding projects be recycled”

### Weston:

- “Worked hard to create an extensive recycling program”
- “Educational materials on recycling along with BPA-free aluminum water bottles were given to residents”
- “Ramped up the compost site and expanded 24 hour accessible yard waste drop off. The Village was saving, on average, over \$300,000 a year on road projects by recycling materials and selling the compost to local landscapers. The initiative earned Weston the 2006 Foth & Van Dyke Good Government Award.”

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<sup>76</sup> From <http://www.city.fitchburg.wi.us/departments/cityHall/publicWorks/solidWaste/index.php>

## Potential Benefits of Practices:

Economic impact	Social impact	Environmental impact
<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>Waste reduction saves costs of closing full landfills and siting and constructing new ones</li> <li>Waste reduction conserves energy and reduces trash bills<sup>77</sup></li> <li>Composting reduces cost of traditional waste hauling, county user fees and tipping fees</li> <li>CHP (Combined Heat and Power) used to generate electricity avoids water treatment fees and saves energy used to process wastewater</li> <li>Waste management practices may qualify for government incentive plans</li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>Reusing materials places less strain on resources and resource markets</li> <li>Composting promotes higher yields of agricultural crops</li> <li>Composting reduces the need for water, fertilizers, and pesticides used for gardening or agricultural activities</li> <li>Recycling reduces energy costs: 30% less energy to use recycled glass for new bottles<sup>78</sup></li> </ul>	<p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>Education campaigns and ordinances increase public awareness and participation in sustainability by reducing household wastes, recycling, composting, purchasing fewer high-impact materials (e.g. Styrofoam, bottled water), etc.</li> <li>Pay-as-you-throw provides equity in trash removal costs for residents<sup>79</sup></li> <li>Composting improves sanitation and public health by avoiding the odor, rodents and insects caused by food waste being dumped in standard trash</li> <li>Recycling and composting improve public image and residents' quality of life</li> </ul>	<p><b><i>Municipal Operations:</i></b></p> <ul style="list-style-type: none"> <li>Waste management practices conserve energy</li> <li>Public education reduces litter in the streets</li> <li>Reduce strain on landfills by slowing down the filling of landfills and opening of new ones</li> <li>Reduces hazardous waste from polystyrene manufacturing<sup>80</sup></li> </ul> <p><b><i>Community:</i></b></p> <ul style="list-style-type: none"> <li>Reusing materials prevents pollution and lowers resource use for manufacturing</li> <li>Waste management reduces emissions from incineration</li> <li>Composting diverts organic materials from landfills thus reducing carbon emissions</li> <li>Composting improves air quality with reduced need for fertilizer transportation</li> <li>Composting removes solids, oil, grease, and heavy metals from stormwater runoff</li> <li>Compost bioremediation captures and destroys 99.6 percent of industrial volatile organic chemicals (VOCs) in contaminated air<sup>81</sup></li> </ul>

<sup>77,79</sup> Pay-As-You-Throw, U.S. Environmental Protection Agency, Retrieved from <http://www.epa.gov/epawaste/conserves/tools/payt/index.htm>

<sup>78</sup> Oregon Metro. (2012). EcoFacts: environmental and economic benefits of recycling.

<sup>80</sup> High Country Conservation Center. The Facts on Styrofoam.

<sup>81</sup> IEPA Innovative Uses of Compost Bioremediation and Pollution Prevention. (1997). U.S. Environmental Protection Agency.

## Guides:

Guide	Source	Link
Waste Reduction	Sustainable Jersey	<p>Waste Audit of Municipal Buildings:  <a href="http://www.sustainablejersey.com/actiondesc.php?arr_num=130&amp;id_num=14!8">http://www.sustainablejersey.com/actiondesc.php?arr_num=130&amp;id_num=14!8</a></p> <p>Schools Pay As You Throw:  <a href="http://www.sustainablejersey.com/editor/doc/p14!91.pdf">http://www.sustainablejersey.com/editor/doc/p14!91.pdf</a></p> <p>Grass – Cut it and Leave it:  <a href="http://sustainablejersey.com/editor/doc/p14!101.pdf">http://sustainablejersey.com/editor/doc/p14!101.pdf</a></p> <p>Backyard Composting:  <a href="http://sustainablejersey.com/editor/doc/p14!111.pdf">http://sustainablejersey.com/editor/doc/p14!111.pdf</a></p> <p>Materials Reuse:  <a href="http://sustainablejersey.com/editor/doc/p14!121.pdf">http://sustainablejersey.com/editor/doc/p14!121.pdf</a></p> <p>EPA WasteWise Partner:  <a href="http://www.sustainablejersey.com/editor/doc/p14!141.pdf">http://www.sustainablejersey.com/editor/doc/p14!141.pdf</a></p>
Recycling	Sustainable Jersey	<p>Purchase Recycled Paper:  <a href="http://www.sustainablejersey.com/editor/doc/p12!21.pdf">http://www.sustainablejersey.com/editor/doc/p12!21.pdf</a></p> <p>Recycling Depot:  <a href="http://sustainablejersey.com/editor/doc/p14!11.pdf">http://sustainablejersey.com/editor/doc/p14!11.pdf</a></p> <p>Increase Construction Waste Recycling:  <a href="http://sustainablejersey.com/editor/doc/p5!91.pdf">http://sustainablejersey.com/editor/doc/p5!91.pdf</a></p> <p>Construction and Demolition Waste Recycling Ordinance:  <a href="http://sustainablejersey.com/editor/doc/p14!21.pdf">http://sustainablejersey.com/editor/doc/p14!21.pdf</a></p> <p>Grounds and Maintenance: Recycled Materials and Composting:  <a href="http://sustainablejersey.com/editor/doc/p12!101.pdf">http://sustainablejersey.com/editor/doc/p12!101.pdf</a></p> <p>Food Waste:  <a href="http://sustainablejersey.com/editor/doc/p14!31.pdf">http://sustainablejersey.com/editor/doc/p14!31.pdf</a></p> <p>Carpet and Foam Padding:  <a href="http://sustainablejersey.com/editor/doc/p14!41.pdf">http://sustainablejersey.com/editor/doc/p14!41.pdf</a></p> <p>Bulky Rigid Plastics:  <a href="http://sustainablejersey.com/editor/doc/p14!51.pdf">http://sustainablejersey.com/editor/doc/p14!51.pdf</a></p> <p>Shrink Wrap:  <a href="http://sustainablejersey.com/editor/doc/p14!61.pdf">http://sustainablejersey.com/editor/doc/p14!61.pdf</a></p> <p>Community Paper Shredding Day:  <a href="http://sustainablejersey.com/editor/doc/p14!71.pdf">http://sustainablejersey.com/editor/doc/p14!71.pdf</a></p>

<b>Guide</b>	<b>Source</b>	<b>Contents</b>	<b>Link</b>
Composting Publications	EPA	Publications on compost use in backyards, forest restoration, stormwater runoff control, bioremediation, etc.	<a href="http://www.epa.gov/epawaste/conserva/composting/pubs/">http://www.epa.gov/epawaste/conserva/composting/pubs/</a>
AgSTAR Program	EPA	Overview of anaerobic digesters, voluntary outreach and educational program, tools and resources	<a href="http://www.epa.gov/agstar/index.html">http://www.epa.gov/agstar/index.html</a>
Great Lakes Region Food Industry Biogas Casebook	Energy Center of Wisconsin	Case studies of anaerobic digesters in Beaver Dam and La Crosse, WI	<a href="http://www.ecw.org/ecwresults/261-1.pdf">http://www.ecw.org/ecwresults/261-1.pdf</a>
Analysis of Waste Collection Service Arrangements	Minnesota Pollution Control Agency	Advantages and disadvantages of open vs. organized systems of waste collection, case studies and implementation issues	<a href="http://www.pca.state.mn.us/index.php/view-document.html?gid=4514">http://www.pca.state.mn.us/index.php/view-document.html?gid=4514</a>

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