

## 2007 Prosperity Index Report: Environmental Integrity Indicators

### Toxic Release Inventory

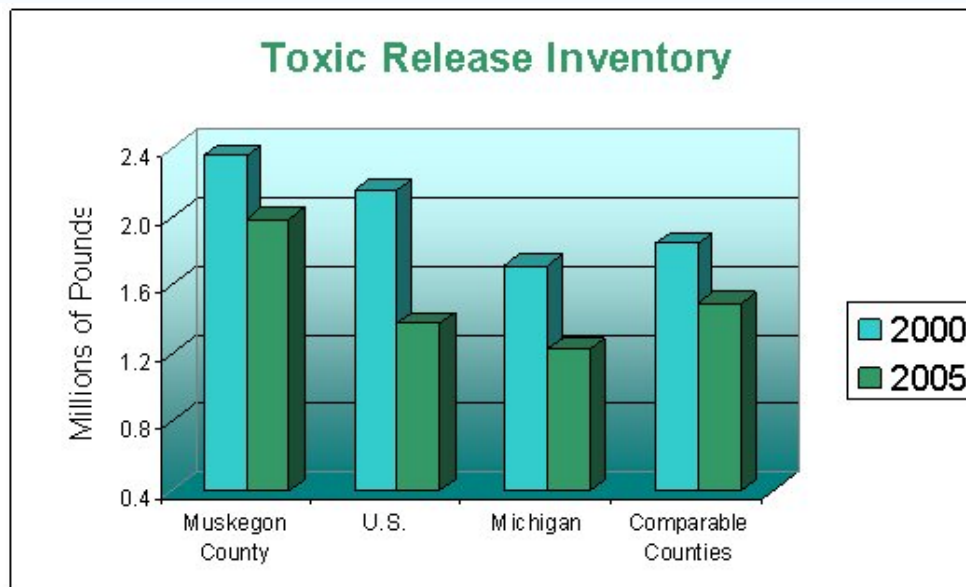
**Why:** Toxic Release Inventory (TRI) is measured so the residents of a particular location know what chemicals are being released into the environments. These chemicals are released into the air, disposed on the ground, or discharged to ground and surface water. Sustainable communities would in general seek to minimize the release of toxic substances.

**What:** The TRI is prepared by the U.S. Environmental Protection Agency (EPA) annually, but is reported two years following the current year. Thus, the 2007 report will not be available until 2009. TRI contains information concerning waste management activities and tracks over 650 chemicals by county. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and expanded by the Pollution Prevention Act of 1990.

**Where:** U.S. Environmental Protection Agency. <http://www.epa.gov/triexplorer>

Toxic Release Inventory (Millions of Pounds)				
Geography	2000		2005	
	Measure	Index Score	Measure	Index Score
Muskegon County	2.362	0.1	1.990	1.1
U.S.	2.160	0.5	1.380	2.5
Michigan	1.720	1.8	1.230	2.5
Comparable Counties*	1.846	1.5	1.496	2.3
Highest	7.355	0.0	8.367	0.0
Lowest	0.265	5.0	0.114	5.0

\*Average by leaving out the highest and lowest comparable county



## Scoring

**Rubric:** There is no standard set that defines what a community's TRI has to be to be sustainable. We developed a target using the 2005 estimate for Michigan (1.23 million pounds).

**Scale:** The above value (1.23 million pounds) was rounded to 1.2 million pounds and used as the "sustainable" level. This value was increased/decreased by .4 million pounds to obtain the index values shown.

Rubric		
Level	Toxic Release Inventory	Index
Target	0.4	5
Thriving	0.8	4
Sustainable	1.2	3
Needs Improvement	1.6	2
Cause for Concern	2.0	1

## Particulate Matter 2.5

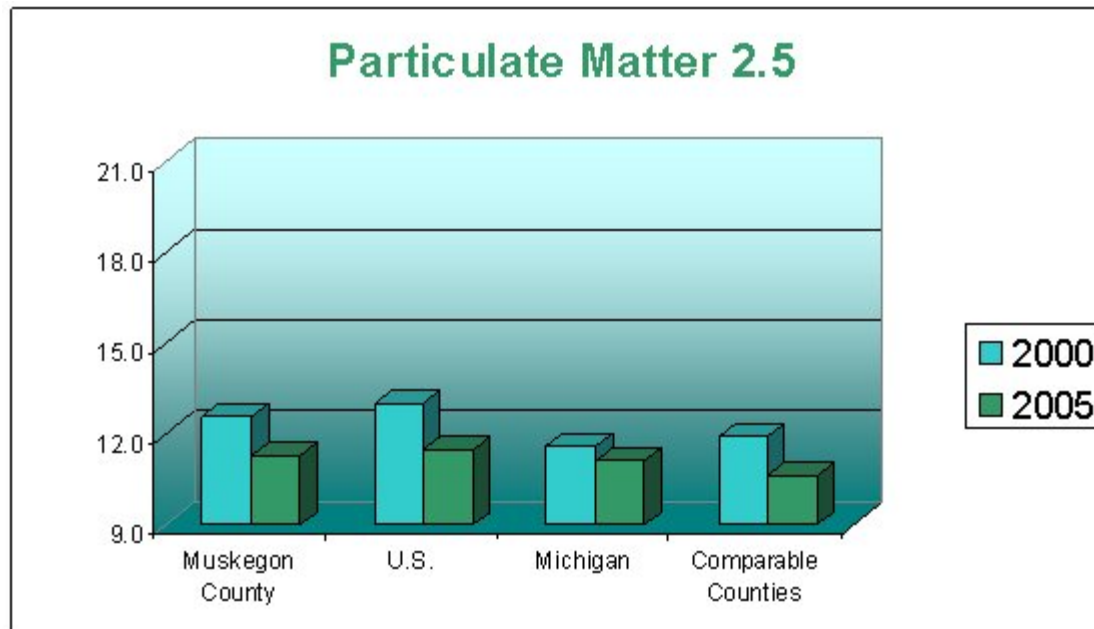
**Why:** Particulate matter (PM) is a measure of air quality, and includes particles less than 2.5 micrometers. This is the upper limit criteria used by the U.S. Environmental Protection Agency (EPA) determined necessary to protect human health

**What:** PM 2.5 is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens. This type of particulate matter can lodge deep in the lungs and cause serious health effects.

Particulate Matter 2.5 ( $\mu\text{g}/\text{m}^3$ )				
Geography	2000		2005	
	Measure	Index Score	Measure	Index Score
Muskegon County	12.6	3.8	11.3	4.2
U.S.	13.0	3.7	11.5	4.1
Michigan	11.6	4.1	11.1	4.3
Peer Counties*	11.9	4.0	10.6	4.4
Highest	13.1	3.7	11.5	4.1
Lowest	11.1	4.3	8.7	4.7

\*Average by leaving out the highest and lowest comparable county

**Where:** U.S. Environmental Protection Agency. <http://www.epa.gov/>



## Scoring

**Rubric:** The EPA has set a current annual PM 2.5 standard at  $15\mu\text{g}/\text{m}^3$ . This score was used as a “sustainable” score.

**Scale:** The scale was developed by an initial increasing rate of  $3\mu\text{g}/\text{m}^3$  from the “sustainable score. A decreasing rate of  $3\mu\text{g}/\text{m}^3$  was applied initially, followed by another decreasing rate of  $4\mu\text{g}/\text{m}^3$ .

Rubric		
Level	PM 2.5	Index
Target	8.0	5
Thriving	12.0	4
Sustainable	15.0	3
Needs Improvement	18.0	2
Cause for Concern	21.0	1

## Land for Agriculture

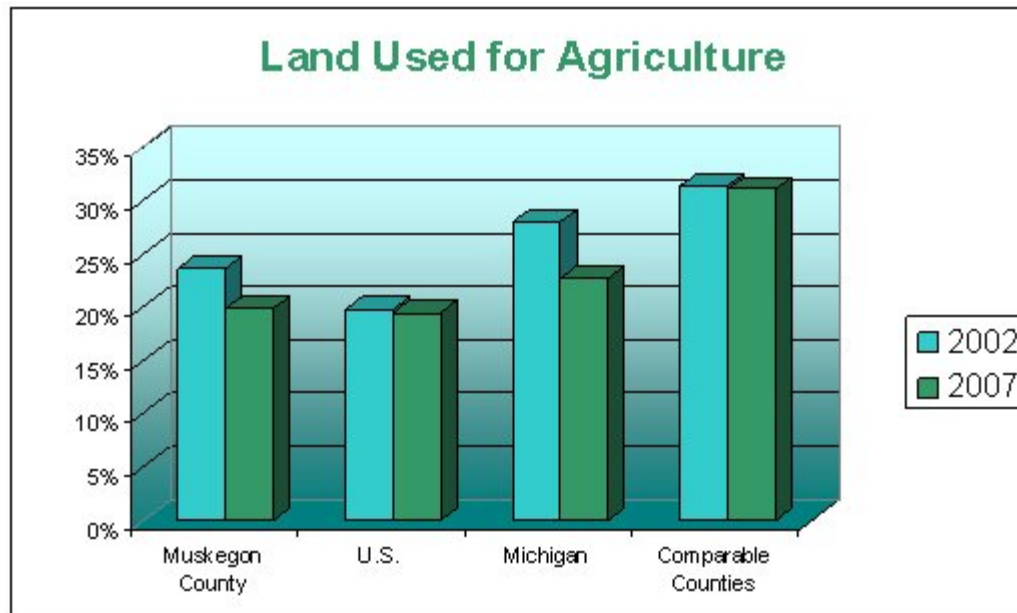
**Why:** Land used for agriculture is represented as the percent of land in a county used in farming. This is important for three reasons: 1.) There is an inherent open space quality or aesthetic value assigned to such land, 2.) Agriculture remains as an important economic sector for counties, 3.) Truly sustainable communities are expected to use local food sources. This helps support local farmers and the economic sector by reducing transportation cost and associated air pollution issues.

**What:** This type of land can be anything from farming crops, growing fruit trees, dairy farms, and pastures.

**Where:** U.S. Agriculture Census (2002 and 2007): <http://www.agcensus.usda.gov/>.

Land Used for Agriculture				
Geography	2002		2007	
	Measure	Index Score	Measure	Index Score
Muskegon County	23.6%	4.7	19.9%	4.0
U.S.	19.8%	4.0	19.5%	3.9
Michigan	28%	5.0	22.7%	4.6
Comparable Counties*	31.4%	5.0	31.1%	5.0
Highest	62.2%	5.0	61.6%	5.0
Lowest	8.3%	4.8	9.3%	0.0

\* Average by leaving out the highest and lowest Comparable County values



## Scoring

**Rubric:** There is no accepted standard suggesting what is the most appropriate amount of agriculture land for a given county. We developed a “thriving” value using an average percent of agriculture for all U.S. counties for 2005 (19.5%).

**Scale:** To get the scale we rounded the average for all U.S. counties to 20% and used this as a “thriving” score. This value was increased and decreased by 5% to obtain the index scores shown.

Rubric		
Level	Land Used for Agriculture	Index
Target	25%	5
Thriving	20%	4
Sustainable	15%	3
Needs Improvement	10%	2
Cause for Concern	5%	1

## Land for Urban

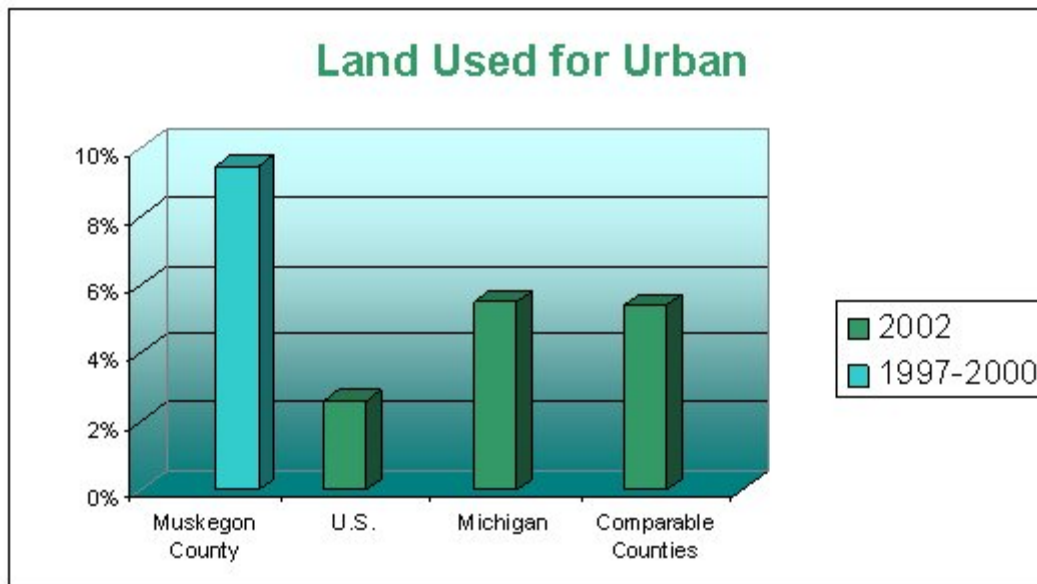
**Why:** Monitoring land use for urban is helpful to determine the rate of urban sprawl. When compared to population change for the same time period it is possible to ascertain the rate of sprawl. Sustainable communities should find ways to invest in and maintain existing infrastructure and central city communities.

**What:** Land used for urban is the percentage of land in a the county that is used for industrial, residential, commercial and residential needs.

**Where:** Muskegon County: IFMap (composite of images from 1997, 1999, 2000). Michigan and U.S. and Comparable County data (2002): <http://www.ers.usda.gov/Data/MajorLandUses>

Land Used for Urban		
Geography	Measure	Index Score
Muskegon County (1997-2000)	9.5%	2.2
U.S. (2002)	2.6%	5.0
Michigan (2002)	5.5%	3.9
Comparable Counties* (2002)	5.4%	3.9
	Highest	9.5%
	Lowest	1.7%

\* Average for Comparable Counties by omitting highest and lowest value



## Scoring

**Rubric:** There is no standard indicating how much land use is either good or bad, or what it should be in order to promote sustainability.

**Scale:** The average percent of urban land for all U.S. counties for 2002 was 2.6%. This number was rounded to 2.5% and used as a “target” score. This value was incrementally increased by 2.5% to obtain the index scores shown.

Rubric		
Level	Land Used for Urban	Index
Target	2.5%	5
Thriving	5%	4
Sustainable	7.5%	3
Needs Improvement	10%	2
Cause for Concern	12.5%	1

## Average Commute Time

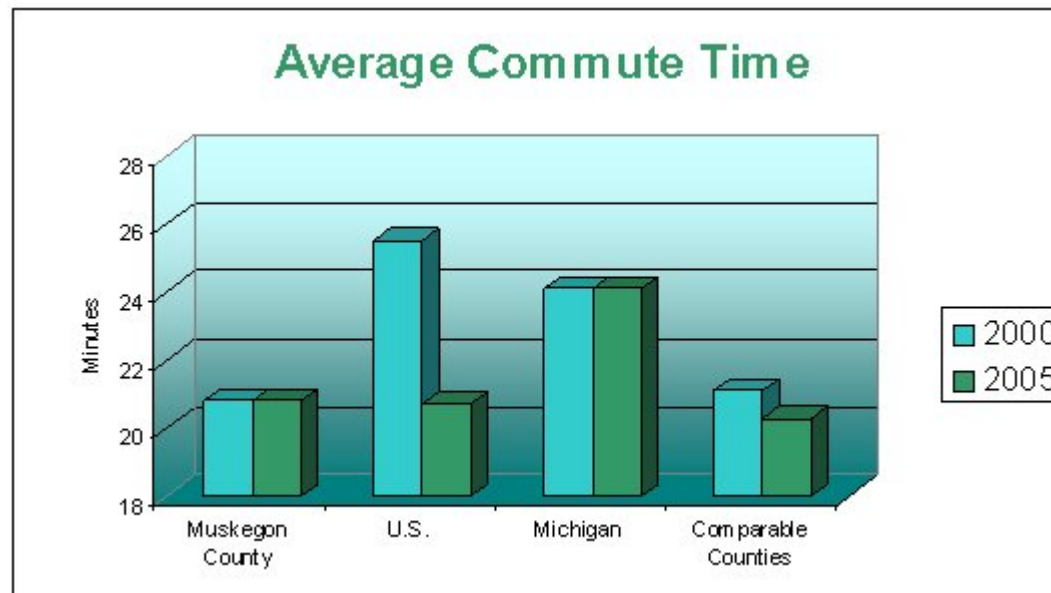
**Why:** Average Commute Time is another indicator often used to measure urban sprawl. As the commute time increases for a community, there is a good possibility that the community is experiencing greater urban sprawl. Furthermore, if there is a high average commute time combined with a high population, there will be a multitude of pollutants that enter the atmosphere in large quantities.

**What:** Average Commute Time is the amount of time it takes a worker to get from their home to their place of employment. The worker must be 16 years of age or older and must not work from home.

**Where:** U.S. Census Bureau, American Community Survey.  
<http://www.census.gov/acs/www/>

Average Commute Time				
Geography	2000		2005	
	Measure	Index Score	Measure	Index Score
Muskegon County	20.8	3.6	20.8	3.6
U.S.	25.5	1.8	20.7	3.7
Michigan	24.1	2.0	24.1	2.0
Comparable Counties*	21.1	3.6	20.3	3.9
Highest	22.3	2.9	24.1	2.0
Lowest	20.0	4.0	18.0	5.0

\* Average for Comparable counties by omitting the highest and lowest value.



## Scoring

**Rubric:** There is no standard that states what an adequate commute time might be. We used data calculated for Comparable Counties in creating our rubric target.

**Scale:** The average commute time for the Comparable Counties was 20.3 minutes. This value was rounded to 20 minutes and used to describe a “thriving” circumstance. This value was increased/ decreased incrementally by 2 minutes until the “needs improvement” score, where it increased by 4 minutes to encompass the full extent of values observed in the Comparable County data.

Rubric		
Level	Average Commute Time	Index
Target	18	5
Thriving	20	4
Sustainable	22	3
Needs Improvement	24	2
Cause for Concern	28	1

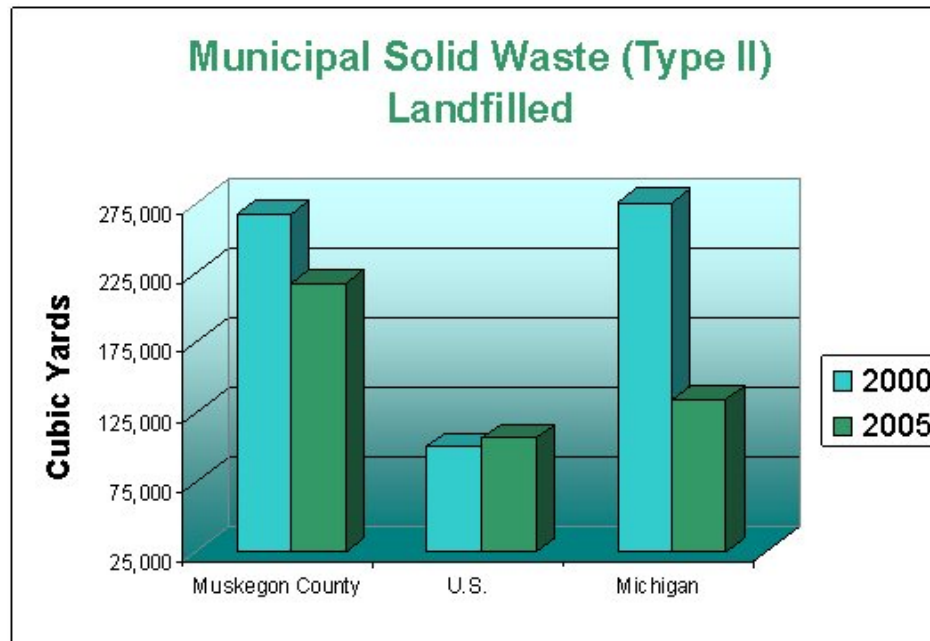
## Municipal Solid Waste (Type II) Landfilled

**Why:** The amount of Municipal Solid Waste (MSW) is used as a surrogate to estimate how much recycling/reusing is being employed by county residents, business, and industry. If this amount of waste disposal decreases (relative to the population growth), then the community is taking steps on reducing the amount of Type II waste being landfilled.

**What:** Type II MSW consists of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, paint, and batteries.

**Where:** Michigan Department of Environmental Quality, Waste Division of MDEQ, "Report of Solid Waste Landfilled in Michigan." (2005 and 2000) <http://www.michigan.gov/deq/0,1607,7-135-3312-47581--,00.html>

Municipal Solid Waste (Type II) Landfilled (cubic yard)				
Geography	2000		2005	
	Measure	Index Score	Measure	Index Score
Muskegon County	267,398	0.0	217,091	1.2
U.S.	100,487	3.5	106,164	3.4
Michigan	563,568	0.0	133,904	2.8
No data for Comparable Counties because it was not consistent and/or available				



## Scoring

**Rubric:** There is no sustainable standard for communities to follow regarding MSW disposal.

**Scale:** The average waste disposal throughout Michigan as a starting point for comparison (133,904 cubic yards). This value was rounded to 125,000 cubic yards and used as the “sustainable” score. This value was increased and decreased by 50,000 cubic yards to obtain the index values shown.

Rubric		
Level	Municipal Solid Waste	Index
Target	225	5
Thriving	175	4
Sustainable	125	3
Needs Improvement	75	2
Cause for Concern	25	1