

# B Indicator Calculations





The following series of tables shows the metric, calculation and data sources used in the Indicator Inventory for each of the plan focus areas.

Table B.1 – Land Use, Livable Communities, and Transportation		
Metric	Calculation	Data Source
1a. Acres of urbanized land per capita	$(\text{Total acreage of urban development}) / (\text{Total population})$	Urban development data – Urban Area, U.S. Census Population – U.S. Census
1b. Percent of population and jobs in centers supported by transit	Center – An area that meets the corresponding thresholds in each of the following categories: <ul style="list-style-type: none"> <li>• Road Connectivity &gt; 20 intersections/mi<sup>2</sup>.</li> <li>• Area must be &lt; 5 miles from a train station</li> <li>• Area must have &gt; 1 bus stop/mi<sup>2</sup></li> <li>• Transit score &gt; 1</li> <li>• Walkability score &gt; 0.3</li> </ul>	Road Data – U.S. Census TIGER Transit Data – RPA, Ulster County, MTA Metro North Schools Data – NYS Department of Education Population Data – U.S. Census Jobs Data – U.S. Census Transportation Planning Package
2a. Ratio of the number of jobs to the number of housing units	$(\text{Total jobs}) / (\text{Average housing units} / \text{Census tract})$	Most recent U.S. Census CTPP available
2b. Ratio of average annual job pay to median home values	$(\text{Average salary put to a 1-10 scale}) / (\text{Median home value normalized to a 1-10 scale per census tract})$	Salary data – County business patterns Home value data – U.S. Census, ACS
2c. Share of housing permits issued for units in multi-family (5+ units) buildings	$(\text{Total permits issued for housing units in multifamily buildings}) / (\text{Total permits issued for all housing units annually})$	U.S. Census, ACS
2d. Percent of people living within one half mile of a park	$(\text{Total number of people living within one half mile of a park}) / (\text{The total population})$	Parkland data - Scenic Hudson. Population data - U.S. Census
3a. Gallons of gasoline sold per registered vehicle	$(\text{Total annual gallons of gasoline sold}) / (\text{Total active vehicle registrations})$	NYSERDA / NYSDMV
3b. Change in carpool, transit, and non-motorized minus change in single occupant vehicle work trips	$(\text{Change in the percentage of work trips by carpool, transit, bike, and walk}) - (\text{Change in the percentage by single occupant vehicle})$	Most recent U.S. Census CTPP available and ACS
3c. Annual vehicle miles traveled	Total annual vehicle miles traveled	NYSDOT



**Table B.1 – Land Use, Livable Communities, and Transportation**

Metric	Calculation	Data Source
3d. Active vehicle registrations per 1,000 capita	$((\text{Total active vehicle registrations}) / (\text{The total population})) / 1,000$	NYSDMV
3e. Hudson River bridge crossings per registered vehicle	$(\text{Total annual Hudson River bridge crossings}) / (\text{Total active vehicle registrations})$	Bridge data – NYSBA Vehicle Registrations - NYSTA
3f. Annual commercial truck traffic at all toll barriers in the Region	Total annual commercial traffic at toll barriers	NYSBA
3g. Transportation fuel use (MMBtu) per capita	$(\text{Total transportation fuel consumption (in MMBtu)}) / (\text{The total population})$	Regional Tier 1 or 2 Greenhouse Gas Inventory, DOT, DMV, CAFÉ impact, NYMTC
3h. Transportation GHG emissions per capita	$(\text{Total transportation GHG emissions}) / (\text{The total population})$	Regional Tier 1 or 2 Greenhouse Gas Inventory, DOT, DMV, CAFÉ impact, NYMTC
4a. All injuries due to motor vehicle accident per 10,000 registered vehicles	$((\text{Total injuries due to vehicle accidents}) / (\text{Active vehicle registrations})) / 10,000$	NYSDOH, Bureau of Injury Prevention
4b. Pedestrian and bike injuries due to vehicle accidents per 10,000 registered vehicles	$(\text{Total pedestrian and bike injuries due to vehicle accidents}) / (10,000 \text{ active vehicle registrations})$	NYSDOH, Bureau of Injury Prevention
4c. Percent of bridges that are classified as “structurally deficient”	$(\text{Total number of bridges classified as structurally deficient}) / (\text{The total number of bridges})$	NYSDOT
4d. Average condition rating of road pavement	Average annual condition rating of road pavement by county	NYSDOT
4e. Percentage of the passenger rail network located in FEMA 100-year floodplains and SLOSH hazard areas	$(\text{Number of miles of rail lines in SLOSH zones and FEMA 100 year floodplains}) / (\text{The total rail line miles})$	National Weather Service (NWS) and MTA Metro-North
4f. Roads in FEMA 100-year floodplain and SLOSH zones	$(\text{Number of miles of road in FEMA 100 year floodplain and SLOSH zones}) / (\text{The total road miles})$	National Weather Service (NWS) and NYSDOT
4g. Population in FEMA 100-year floodplain or SLOSH zone	$(\% \text{ of land area of Census tract in SLOSH zone}) \times (\text{Population of Census tract})$	National Weather Service (NWS) and US Census



TABLE B.2 - ENERGY		
Metric	Calculation	Data Source
1a. Energy intensity: Regional energy consumption (MMBtu) per capita	(The sum of annual energy uses by sector) / (The total population) Where the sum of regional energy consumption = Residential Energy Consumption + Commercial Energy Consumption + Industrial Energy Consumption + Transportation Energy Consumption	Energy use data - Regional Tier 2 Greenhouse Gas Inventory, NYSERDA and US EIA; Subcomponents include annual energy use for residential, commercial, industrial, and transportation; <sup>1</sup>
1b. Stationary fossil fuel use (MMBtu) per capita	Regional fossil fuel combustion in stationary sources per capita = (The sum of fuel combustion for space heating and cooling) / (The total population <sup>2</sup> )	Energy uses from Regional Tier 2 Greenhouse Gas Inventory, NYSERDA and US EIA Subcomponents include annual energy use for residential, commercial, industrial, and transportation
1c. Stationary fuel consumption GHG emissions (MTCO2e)	See Regional GHG Inventory	See Regional GHG Inventory
2a. Installed capacity (MMBtu) per capita	(The sum of renewable installed generation capacity) / (The total population) Where the sum of the capacity of all on-site renewable energy sources = On-Site Solar PV Capacity + On-Site Solar Thermal Capacity + On-Site Wind Turbine Capacity + On-Site Geothermal Capacity + Capacity of Other On-Site Renewable Sources	NYSERDA and Regional Tier 2 Greenhouse Gas Inventory Subcomponents include cumulative generation capacity from installations of PV, solar thermal, wind, biomass, geothermal, etc.

<sup>1</sup> Energy use intensity: A further refinement would be Energy intensity per dollar of Gross Regional Product.

<sup>2</sup> Stationary fossil fuel use intensity: A further refinement would be weather-normalizing this use annually:  $\sum \text{Fuel Combustion for each fuel type} = [(\text{Btu}/\text{Household}/\text{HDD for space heating}) \times \text{HDD} \times (\# \text{ of households})] + [(\text{Btu}/\text{Household}/\text{CDD for space cooling}) \times \text{CDD} \times (\# \text{ of households})] + [(\text{Btu}/\text{Household for dhw}) \times (\# \text{ of households})] + [(\# \text{ of Employees in region} / \# \text{ of employees in state}) \times \text{Statewide commercial consumption}] + [(\# \text{ of Employees in region} / \# \text{ of employees in state}) \times \text{Statewide Industrial consumption}] - [\text{Industrial fuel consumption} \times \% \text{ consumed in non-energy uses}]$



**TABLE B.3 MATERIALS MANAGEMENT**

Metric	Calculation	Data Source
1a. Per capita MSW disposal (lbs/person/day)	Weighted population average of ((Annual lbs MSW) / (County population)) / (365 days/year)	County Planning Unit, Solid Waste Management Plans
2a. Recycling Rate (%)	Weighted population average of (Total materials recycled (MSW +C & D) per county / Total materials generated per year per county)	County Planning Unit, Solid Waste Management Plans
2b. GHG Emissions (Million MTCO <sub>2</sub> e)	See Regional GHG Inventory	See Regional GHG Inventory



**TABLE B.4 AGRICULTURE AND OPEN SPACE**

Metric	Calculation	Data Source
1a. Acres of farm land	Total acres of farmland	USDA Census of Agriculture
1b. Number of farms	Total number of farms	USDA Census of Agriculture
3a. Number of farmers markets	Total number of farmers markets	County Tourism Offices of Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester Counties
3b. Number of municipal markets	Total number of municipal markets	County Tourism Offices of Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster and Westchester Counties
4a. GHG emissions (MTCO <sub>2</sub> e)	See Regional GHG Inventory	See Regional GHG Inventory
5a. Net cash farm income in the Region	$(\text{Total cash farm receipts}) / (\text{Total cash farm costs})$	USDA Census of Agriculture
5b. Net cash farm income per farmer	$((\text{Total cash farm receipts}) / (\text{Total cash farm costs})) / (\text{Total number of farmers})$	USDA Census of Agriculture
6a. Acres of land preserved from development	$(\text{Total land preserved}) / (\text{The total Population})$	Scenic Hudson, US Census
7a. Average acreage of contiguous forests	$(\text{Total acreage of contiguous forest}) / (\text{The number of counties in the Region})$	NYSDEC



TABLE B.5 WATER		
Metric	Calculation	Data Source
1a. Per capita water withdrawals for domestic self-supply	$(\text{Total water withdrawals for domestic self-supply}) / (\text{The total population})$	United States Geological Survey (USGS) Estimated Use of Water in the United States, County-Level Data for 2005
1b. Per capita water withdrawals for public supply	$(\text{Total water withdrawals for public supply}) / (\text{The total population})$	United States Geological Survey (USGS) Estimated Use of Water in the United States, County-Level Data for 2005
2a. Energy use per gallon of wastewater	$(\text{Total energy used}) / (\text{Gallons of potable water used})$	Energy Estimate: Water & Sustainability (Volume 4): U.S. Electricity Consumption for Water Supply & Treatment - The Next Half Century, Electric Power Research Institute (EPRI), 2002
3a. HUC 12 watersheds with >10% impervious cover	GIS mapping	United States Geological Survey (USGS) – National Land Cover Database, Percent Developed Imperviousness, 2001 and 2006
4a. Annual expenditure per volume of water treated	$(\text{Annual expenditure}) / (\text{The total volume of water treated for water production})$	United States Geological Survey (USGS) Estimated Use of Water in the United States, County-Level Data for 2005
4b. Annual expenditure per volume of wastewater treated	$(\text{Annual expenditure}) / (\text{The total volume of water treated for wastewater treatment})$	2004 Descriptive Data of Municipal Wastewater Treatment Plants in New York, NYSDEC; United States Environmental Protection Agency (USEPA) Enforcement and Compliance History Online Database
5a. Percent of assessed 303(d) streams/water bodies that are impaired	Total number of impaired water bodies	NYSDEC Waterbody Inventory and Priority Waterbodies List (WI/PWL), 2007; U.S. Department of Agriculture Watershed Boundary Dataset 2009.
5b. Percent assessed	$(\text{Total number assessed}) / (\text{Total number of streams})$	NYSDEC Waterbody Inventory and Priority Waterbodies List (WI/PWL), 2007; U.S. Department of Agriculture Watershed Boundary Dataset 2009.
5c. Percent of streams assessed under biomonitoring program	$(\text{Total number assessed}) / (\text{Total number of streams})$	NYSDEC Stream Biomonitoring Program, 2012