TELECOMMUNICATIONS

Existing Conditions

CNY is well served by the telecommunications industry. Currently, there are four major incumbent local exchange carriers serving the region, led by Verizon. Numerous competitive carriers are also operating in the community. The area is served by several major network operations centers and fiber optic cabling is extensively deployed throughout the region, with heavy concentrations in the region's urban areas, intermediate population centers, and along major transportation corridors.

Fiber resources can also be found in selected rural parts of the region along routes which are used to connect various activity centers. Telecommunications carriers have developed 67 central offices[49] in CNY, strategically located throughout the region. A significant majority of these central offices are connected with fiber optic service. Wireless services are widely available in CNY through a network of over 600 registered cell tower locations. Satellite and microwave systems are also in operation in the region. The telecommunications services offered over these networks includes a full range of voice, video, and data transmissions utilizing such high bandwidth systems as ISAN, frame relay, digital subscriber line, DS1, DS3, SONET, and Ethernet technologies.[50]

The wire based and wireless services available in CNY are considered to be among the most advanced and desirable to the industry. A comprehensive array of telecommunications services and competition is widely available in the region. The telecommunications system in CNY is comparable to other major metropolitan areas in the United States and is a tremendous economic development resource for this region.

All telecommunications services require a certain amount of electronic bandwidth. Bandwidth is the combination of capacity and speed at which a signal is communicated across the network. Typically, voice transmissions require the least amount of bandwidth, then data, and then video. The type of signal transmission is based upon the equipment on the ends and everything in between.

Basic telecommunications services typically include such services as residential or business telephone lines, faxes, or dial up Internet access. These services generally operate over existing copper infrastructure and are widely available throughout rural and urban areas. The maximum transmission rate is 56kb/ second which until the Internet wave of the 1990s took hold was considered sufficient capacity. The desire for increased Internet capacity and global economic competition has increased the dependence on higher capacity services.

High bandwidth (broadband) services, as defined by the FCC, are data communication services that support download transmission rates of at least 200kb/second. Telecommunications carriers provide high bandwidth services through a variety of systems. Most providers can offer T1, ISDN, Frame Relay and SONET services in the urban/suburban areas of the region.

The Central New York region is primarily within the (315) area code and the Syracuse Local Access Transport Area (LATA), with the exception of Cortland County, which is in the Binghamton LATA's (607) area code. In addition to the traditional telephone companies serving the CNY region, there are many other local and long distance service providers, interconnect providers, Internet providers, wireless, and satellite service providers.

Verizon has made a substantial investment in the region's infrastructure. Verizon's Network Operations Center in Syracuse, is a major node for interconnecting their CNY region with Western New York (Buffalo), Finger Lakes (Rochester), Southern Tier (Binghamton), and the Capital District (Albany).

Time Warner Communications also operates a major regional Network Operations Center in Syracuse. This Center interconnects and supports their operations in Western New York (Buffalo), Finger Lakes (Rochester), Southern Tier (Binghamton) and the Capital District (Albany). Time Warner currently provides broadband "Roadrunner" Internet access to businesses and residences in the region. By 2004, Time Warner also plans to make its telephone service "Line Runner" widely available directly competing with Verizon and other local telephone service providers.

Verizon Wireless, Cingular, and Sprint PCS provide cellular and digital mobile services throughout the region. All three of these companies are making infrastructure upgrades from current 2G wireless networks to next generation 3G network technology. Satellite and microwave services are also operational throughout CNY, providing video as well as point to point high capacity private network services.

Issues and trends

The telecommunications industry is a catalyst for today's global economy. Industry, commerce, public safety, education, research and development,

and financial investments are all increasingly dependent upon accessible, responsive, reliable, and affordable communications – anywhere at any time. Broadband facilitates transformative change in a wide range of key sectors from power, transportation, buildings, education, health and agriculture. Networked information and communication technologies can help to achieve a sustainable development model, as broadband-enabled innovation in applications and services promote the integration of 'smarter' and more energy-efficient economic growth, social development and environmental protection the three pillars of sustainable development.

Broadband is a powerful tool for economic development. It is essential for economic growth and can dramatically increase access to health care, education, and job training; can create jobs; and can support public safety needs. Existing businesses and entrepreneurs who effectively leverage broadband are best equipped to compete in the global market and are most likely to remain in the State and expand their business. Alternatively, communities with high-speed Internet access find it easier to attract new employers and encourage local entrepreneurism. Although New York's availability rate is approximately 96 percent, the number of New York citizens without access to high-speed Internet is more than the entire population of Vermont. New York State has a broadband adoption rate of 70 percent, which translates to 6.4 million people who cannot or do not subscribe to broadband. In short, too many New Yorkers lack access to affordable broadband services.[51]

Economic Benefits of Broadband:

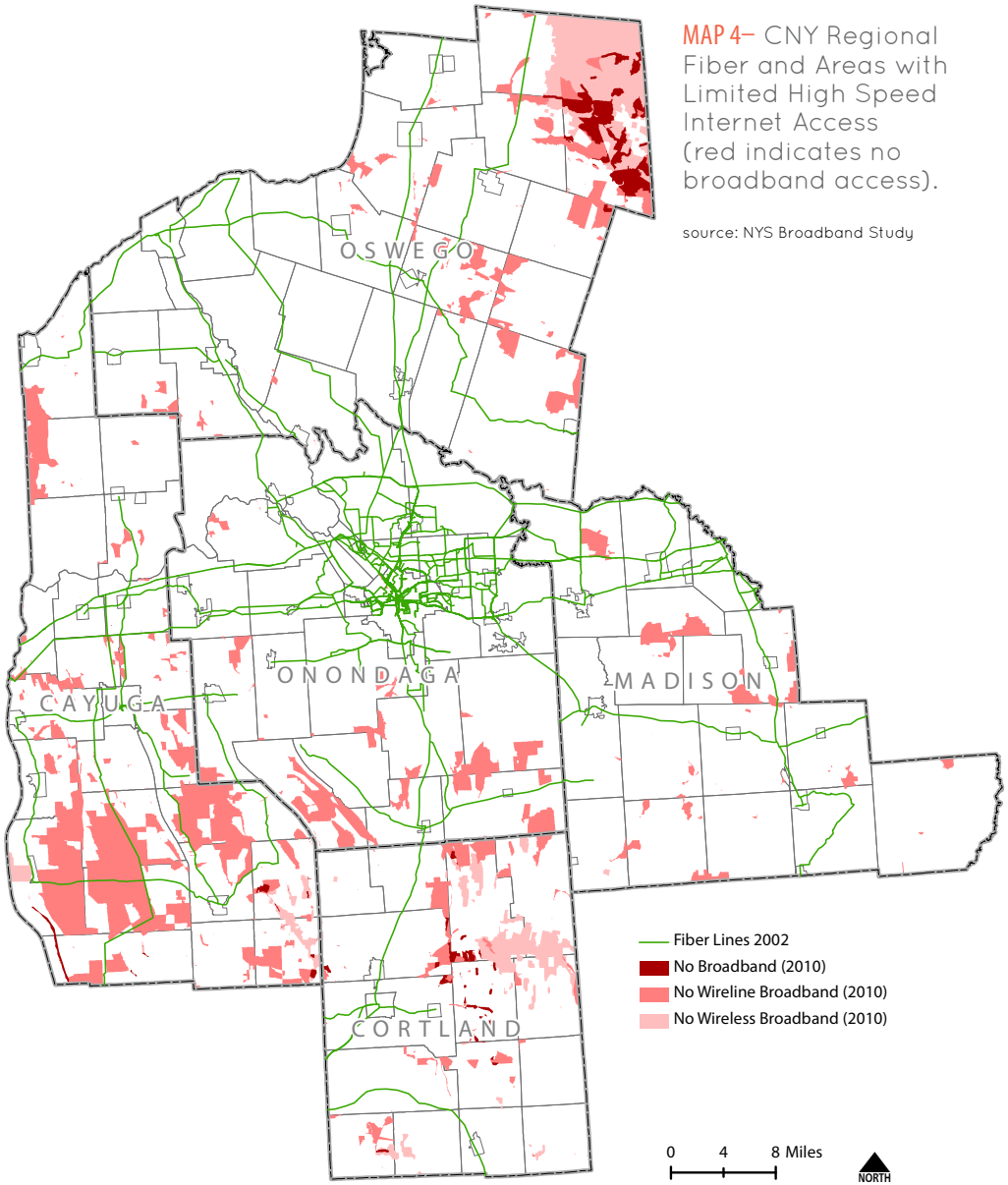
+ If All Homes had Basic Broadband Services – The U.S. Economy Would Gain 1.2 Million Jobs and $500 Billion Per Year

+ 1/3 of U.S. Productivity Growth in Past 10 Years is Due to Investments in Broadband and Related Information Technology

+ Every $1 Spent Online Influences an Additional $3.45 Spent in Stores

+ The Internet Employs 1.2 Million People for 3 Million Jobs Totaling $300 Billion

Approximately 67,500 in CNY do not have access to broadband with speeds higher than 6Mbps, and there are 31,750 people in CNY with no access to broadband.



MAP 4– CNY Regional Fiber and Areas with Limited High Speed Internet Access (red indicates no broadband access).

source: NYS Broadband Study

Many of New York's coverage gaps exist because of the costs associated with "last-mile" access. Simply put, providers generally have a presence in many New York un-served areas, but are unable to provide service to many New York residents due to the prohibitive costs of extending fiber to the home or business. This is especially true in rural areas, where housing densities are much lower. Most un-served citizens in New York live in small pockets such as those described above, which makes closing the availability gap a very challenging proposition. As would be expected, current broadband mapping data illustrates a strong correlation between low population densities and lower broadband availability.

While there is minimal loss of coverage regionally, there are wider disparities regarding access when viewed by individual counties. Cayuga County has the largest disparity of residents without access to broadband above 6Mbps. This level of service is critical because broadband speeds of more than 6 Mbps are required to conduct most online activities and the most comparable speed tier to the FCC's definition of broadband (4 Mbps download / 1 Mbps upload).

TABLE 6–WIRELESS BROADBAND SERVICE DEFICIENCIES IN CENTRAL NEW YORK

Source: NYS Broadband Study

County Name	Area (sq miles)	Population 2010	Estimated Population Speeds w > 6 mbps	Estimated % Population Speeds w >6 mbps
Cayuga	882	80,026	58,750	73%
Cortland	501	49,336	42,000	85%
Madison	661	73,442	66,250	90%
Onondaga	805	467,026	452,500	97%
Oswego	1,401	122,109	110,000	90%

"Connect NY" provides $25 million in grants available through the Regional Councils and Empire State Development to expand promote and expand high-speed Internet access in rural upstate and underserved urban areas of the State. With over 700,000 New Yorkers unable to access broadband, and another six million citizens facing significant obstacles to connect, expanding high-speed internet was identified by many Regional Councils as a priority to stimulate local business growth. The "Connect NY" Broadband Grants are designed to spur investment by broadband service providers and expand broadband connectivity and economic development in each region.

WATER INFRASTRUCTURE

Water systems

The region's water infrastructure can be separated into three main categories: drinking water supply, wastewater treatment, and stormwater management. There are several main issues facing the region's water systems. While the region is blessed as a whole with excellent drinking water sources, water quality in some of the key watersheds in the region are in need of protection.

Central New York's surface and groundwater resources adequately meet the collective water needs of municipalities, households, businesses and industries across the region. Most lakes and rivers in Central New York are multipurpose waterbodies with uses ranging from public water supply and wastewater assimilation, to recreation and hydroelectric power generation. Approximately 60 million gallons of surface water is withdrawn per day to meet the domestic, industrial, agricultural and mining needs of CNY. In 2005, the last year for which data is available, regional patterns of water use indicate that the largest demand for water withdrawals (fresh and saline) is for thermoelectric generation (86%), followed by Public Supply (10%) , Industrial (2%), Domestic (1%), Irrigation (0.3%), Livestock (0.3%), Aquaculture (0.3%), and Mining (.13%) (USGS, 2005). High-yielding groundwater aquifers, such as those located in Cortland County and in the Tug Hill Plateau, serve as primary drinking water sources for many communities within the region. The majority of the Region's water supply is drawn from Lake Ontario and three Finger Lakes (Owasco, Skaneateles, and Otisco Lakes). Drinking water sources also include rivers, streams and ponds.

There are 72 non-transient community water systems in Central New York, each supplying a minimum of 100 people. The Cities of Fulton and Cortland, in addition to a number of small village systems and many individual residences rely on groundwater as a primary drinking water source. Large yields are available from relatively shallow wells tapping the permeable glacial deposits and extensive water-saturated sand and gravel deposits which line many valleys throughout the Region. **Based on current reported withdrawals from public water suppliers meeting the 100,000 gpd reporting threshold, there is a greater than 100% surplus in available public water.**

The region is faced with aging wastewater and stormwater infrastructure. Aging infrastructure causes extensive problems such as lost water, inflow and infiltration and, in some cases, sanitary sewer overflows. The average design life of sewer pipe is 50 to 70 years, and some systems within the region are approaching 100 years. According to the American Society of Civil Engineers, aging water infrastructure results in 7 billion gallons of water lost each day in the United States. The U.S. also discharges approximately 10 billion gallons of raw sewage into lakes and rivers every year from combined sewer overflows. The high costs of maintaining or replacing aging

One of the most prevalent issues with aging infrastructure is inflow and infiltration. Stormwater overflow occurs when groundwater or stormwater enters sanitary sewage systems due to improper connections, cracks or leaks. This adds to the flow in the sanitary sewer, resulting in the conveyance and treatment of groundwater and stormwater at a substantial cost to the water treatment sysetms, municipalities and taxpayers due to the large amount of energy necessary to convey (when pumped) and treat sewage. Stormwater also uses valuable capacity in the sanitary sewer system, which may require the addition or expansion of treatment facilities to treat larger volumes of sanitary sewage. In addition, stormwater may create sanitary sewer overflows during wet weather events, polluting the environment and compromising public health.[52]

Drinking Water Supply – Existing Conditions

The Skaneateles Lake Watershed which provides drinking water primarily for the City of Syracuse, Otisco Lake which supplies the Onondaga County Water Authority, Owasco Lake which provides water to the City of Auburn, as well as the entire Lake Ontario Watershed which provides drinking water to a majority of the residents of the region through the Metropolitan Water Board are critical water resources that must be protected. Additionally, sole source aquifers within the region that provide drinking water and that can be affected by agricultural and mining/drilling processes and should be giving careful consideration.

Three primary entities are responsible for providing water service in Onondaga County:

+ The Metropolitan Water Board and the Onondaga County Water District;
+ The Onondaga County Water Authority; and
+ The City of Syracuse Water Department.

In the four surrounding counties, the small cities of Auburn, Oswego, Fulton, Cortland, and Oneida supply water to the majority of residents.

TABLE 7– Major Water Supply Systems in Central New York

		million gallons/day		
System	Source	2011 Average	Maximum Capacity	%Percent of Capacity
Metropolitan Water Board	Lake Ontario	18.5	50	37%
Onondaga County Water Authority	Otisco Lake	17.28	20	86%
City of Syracuse	Skaneateles Lake	35.52	58	61%
City of Oswego	Lake Ontario	9	20	45%
City of Auburn	Owasco Lake	4.8	15	32%
City of Oneida	Florence Creek	2.2	3.4	65%
City of Cortland	groundwater	2	10	20%
City of Fulton	groundwater	1.2	5	24%

The infrastructure related to these entities is directly related to the region's current development patterns as the provision of water infrastructure has taken place in response to development pressures. Water infrastructure can and often does induce further growth in areas where such growth might not be preferred.

Although the supply of freshwater is not an immediate issue in Central New York, it is a finite resource that must be used wisely and protected against unnecessary loss. On hot summer days, demand can increase by as much as 67% over an average day's production.[53] Additionally, many drinking water systems have reached or exceeded 100 years of age and are still utilizing some of their original infrastructure. Various system components have life cycles which can range from 20 years (pumps, filter media, etc.) to 50 years (storage tanks, treatment plants), to over 100 years (transmission and distribution mains). Normal upstate NY climate related factors, including snow load, ice formation and freeze/thaw cycles can significantly shorten the useful life of certain water system components resulting in significant unaccounted for water loss due to leaks and failures in our aging clean water infrastructure system. While regular rehabilitation and maintenance can extend the useful life of certain water system component, eventually, they will all require replacement.

Metropolitan Water Board (MWB)

The Metropolitan Water Board (MWB) is the administrative body of the Onondaga County Water District (OCWD) and provides wholesale drinking water from Lake Ontario throughout major portions of the Central New York region.

The MWB was created in the mid-1960s to provide wholesale drinking water from Lake Ontario to municipal corporations and public authorities and to supplement the limited capacity of the area's primary retail water utilities – Onondaga County Water Authority (OCWA - Otisco Lake supply) and The City of Syracuse (Skaneateles Lake supply). The system was designed to meet the needs of a County population that was projected to grow to 788,700 residents in 2020, resulting in the current excess capacity, based on Onondaga County's population of 467,026 as reported by the 2010 U.S. Census.[54] The MWB system has the capacity to sustain production of up to 60 million gallons/day and store in excess of 110 million gallons of water for emergencies, including fire protection and periods of drought. During 2011 the MWB provided roughly 18.5 million gallons/day to OCWA (roughly 50% of the OCWA total annual delivered water of 13.59 Billion Gallons for 2011). There is significant capacity within the system.

The Metropolitan Water Board (MWB) pumps water from Lake Ontario through an eight foot diameter intake it shares with the City of Oswego. From an offshore intake in Oswego, "raw" water is pumped to a nearby Water Treatment Plant where it is filtered, purified and tested prior to the transmission of "finished" water to a Terminal Reservoir in the Town of Clay. By 2014, the Terminal Reservoir will be replaced by covered tanks as a means of compliance with the United States Environmental Protection Agency (EPA) Long Term 2 Enhanced Surface Water Treatment Rule (see Current Capital Projects link).

Water exiting the treatment plant is then pumped to distribution reservoirs and tanks in Onondaga County and distributed on a wholesale basis to the Onondaga County Water Authority (OCWA), the City of Syracuse, and the Town of Hannibal located in Oswego County (see Figure 1). The drinking water is supplied by OCWA to consumers in Onondaga, Oneida, Oswego and Madison Counties; the City of Syracuse in Onondaga County; and the Town of Hannibal in Oswego County.

MAP 5– Metropolitan Water Board Distribution System

Water exiting the Metropolitan Water Board treatment plant is pumped to distribution reservoirs and tanks in Onondaga County and distributed on a wholesale basis to the Onondaga County Water Authority (OCWA), the City of Syracuse, and the Town of Hannibal located in Oswego County.

To fund major capital projects, MWB collects ad valorem taxes from three zones of assessment in the OCWD, as well as customers outside the OCWD, while operating and maintenance costs are funded by sales revenue from wholesale water rates.

In 2010 and 2011, in partnership with OCWA, MWB completed and began operation of a 20 million gallon tank to replace the Western Reservoir and two tanks with a combined capacity of 50 million gallons to replace Eastern Reservoir, shifting storage capacity to the east. The final element of the Storage Master Plan implementation will continued in 2012 as construction began on two 15 million tanks to replace Terminal Reservoir. Construction is anticipated to continue into 2014. Through these projects, MWB is demonstrating a leadership role in implementing use of best practices for green infrastructure design and construction. As an example, Onondaga County is considering the installation of solar photovoltaic systems on top of the covered storage tanks.

Onondaga County Water Authority (OCWA)

The Onondaga County Water Authority (OCWA) is by far the largest drinking water provider in the Central New York region serving 340,000 residential customers, thirty large industrial customers, three municipal wholesale water customers (DeWitt, Clay, and Camillus), and supplying water on an intermittent or emergency basis to seven additional municipal water systems (see Table 8 on page 101). OCWA is among the 125 largest publicly owned water suppliers in the United States. Created in 1951, OCWA water originates from Otisco Lake (approximately 17.28 million gallons/day in 2011, or 46.4% of OCWA's total water supply). OCWA also purchases water wholesale from the MWB (Lake Ontario approximately 20 million gallons/day, or 49.8%). OCWA purchased an additional 1.41 million gallons/day from the City of Syracuse (Skaneateles Lake 3.7% of total water supply).

Since 1993 OCWA has absorbed seventeen local water utilities, growing by more than 50% in the last twenty years from about 60,000 service connections to over 100,000 connections (see Map 6 on page 102). Only one-third of that growth came from new construction.[55] OCWA is now responsible for the maintenance of over 2,000 miles of main pipeline; with several million dollars worth of pipeline replaced each year. Additionally OCWA operates 56 storage facilities and 41 pumping facilities.

OCWA's growth has primarily been related to acquisition of existing water systems, such as those in the Town of Van Buren, the Villages of Minoa, East Syracuse and Marcellus, and Metropolitan Water Board facilities, or through the construction of town water districts designed to service existing homes in the Towns of Marcellus, Otisco, Spafford and Skaneateles. However, as new development continues to be proposed by developers and approved by municipalities in areas that require infrastructure extensions, at the request of municipalities OCWA installs new water mains and other associated infrastructure that is paid for by developers. This is occurring predominantly in the Towns of Clay, Cicero and Onondaga.[56]

TABLE 8–Municipalities that receive service from OCWA

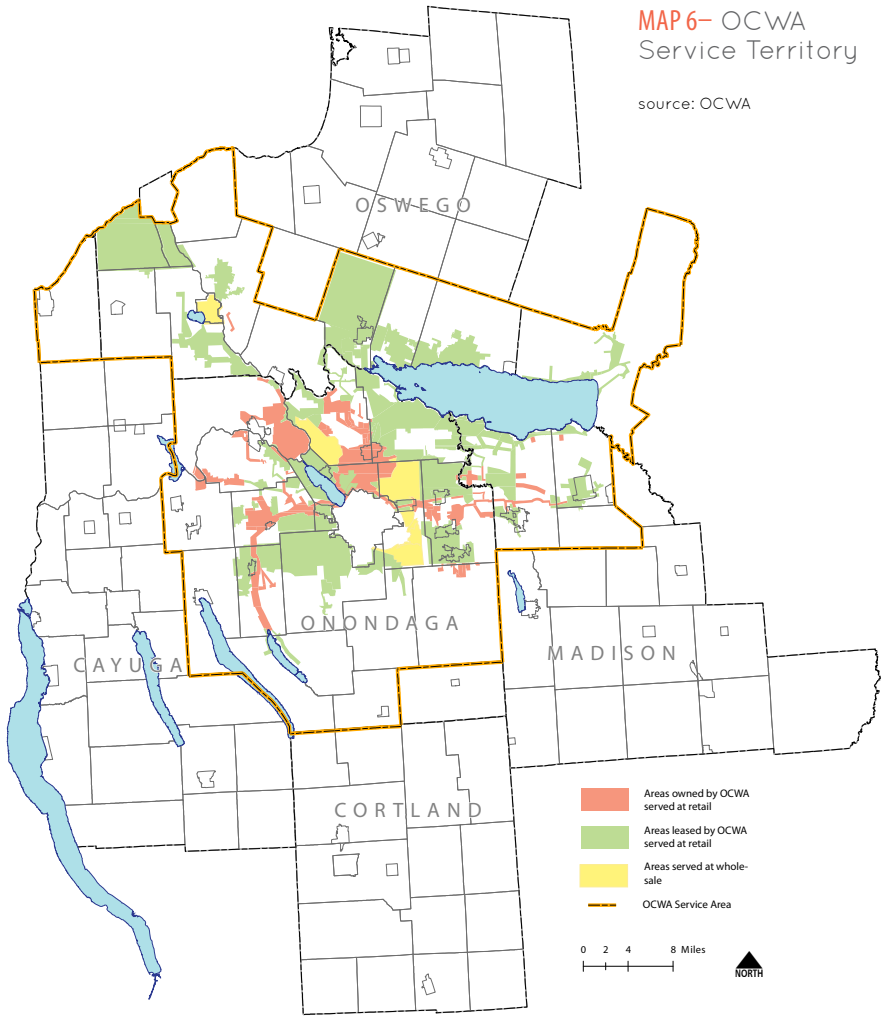
ONONDAGA COUNTY			
Towns, cities	Water source	Villages	Water source
Camillus	Otisco/ Skaneateles	Baldwinsville	Ontario*
Cicero	Otisco/Ontario	Camillus	Otisco
Clay	Otisco/Ontario	E. Syracuse	Otisco/Ontario
DeWitt	Otisco/Ontario/ Skaneateles	Fayetteville	Ontario
Elbridge	Otisco	Liverpool	Otisco/Ontario
Geddes	Otisco/Ontario/ Skaneateles	Manlius	Ontario
Lafayette	Ontario	Marcellus	Otisco
Lysander	Otisco/Ontario	Minoa	Otisco/Ontario
Manlius	Ontario/Skyridge Wells	N. Syracuse	Otisco/Ontario
Marcellus	Otisco	Solvay	Otisco
Onondaga	Otisco/ Skaneateles		
Otisco	Otisco		
Pompey	Ontario		
Salina	Otisco/Ontario		
Skaneateles	Otisco		
Spafford	Otisco		
Syracuse	Otisco/Ontario*		

ONONDAGA COUNTY			
Tully	Tully Valley Springs		
Van Buren	Otisco/Ontario		
*Emergency connection only			
MADISON COUNTY			
Towns, cities	Water source	Villages	Water source
Lenox	Ontario	Canastota	Ontario
Sullivan	Ontario	Chittenango	Ontario
Oneida (City)	Ontario*		
*Emergency connection only			
ONEIDA COUNTY			
Towns, cities	Water source	Villages	Water source
Verona	Ontario	Sylvan Beach	Ontario
Vienna	Ontario		
Annsville	Ontario		
OSWEGO COUNTY			
Towns, cities	Water source	Villages	Water source
Fulton	Ontario*	Central Square	Ontario
Granby	Ontario	Phoenix	Ontario*
Hastings	Ontario		
Oswego (Town)	Ontario		
Oswego (City)	Ontario*		
Schroeppel	Ontario		
West Monroe	Ontario		
Volney	Ontario		
Minetto	Ontario		
Scriba	Ontario*		
*Emergency Connection Only			

OCWA's water rates have more than doubled in the last ten years for several reasons, including increased pension and health care costs, increased purchased water costs, enhanced security, upgrades to comply with changes to the Safe Drinking Water Act, and ongoing replacement of older tanks, pump stations, meters and water mains. At the same time rates remain competitive nationally. Residential rates are in the median range for the country, while industrial rates remain in the bottom quartile.

MAP 6– OCWA Service Territory

source: OCWA



While the number of service connections has risen, overall water consumption has declined in recent years. In 2011, OCWA experienced a 14.24 percent decrease in water consumption, followed by an additional 11.62 percent decrease in consumption in 2012. Through investments in efficiency, and upgrades to reduce loss throughout its systems OCWA has seen a 10 percent decrease in energy consumption over the past decade.

City of Syracuse

The City of Syracuse Water Department (SWD) provides retail water service to the entire City of Syracuse. Through wholesale and other service agreements, the SWD also supplies water to portions of the towns of DeWitt, Onondaga, Geddes, Camillus, Skaneateles, Salina, and the villages of Jordan and Elbridge. Since 1894, the primary water supply for the City of Syracuse has been Skaneateles Lake, one of the Finger Lakes located approximately 20 miles southwest of the City.

The Syracuse water system is made up of over 500 miles of pipelines to deliver water from Skaneateles Lake to the City and to distribute the water throughout the City. The water supply system consists of water storage in Woodland and Westcott Reservoirs on the west side of the City. Water is also stored in two standpipes and in the three tanks that comprise Morningside Reservoir.

The City is able to supplement its Skaneateles Lake water supply with Lake Ontario water when necessary through an interconnection with MWB facilities. The City normally relies upon Lake Ontario water during times when drought conditions limit the available supply from Skaneateles, during emergencies, or during periods of high consumption. Since the MWB system is connected to the City's system on the north side of the City, this area may receive water from Lake Ontario from time to time.

The Woodland Reservoir Ultraviolet Light Treatment Facility Project is a two-year project mandated by the federal government that will begin in July. The project involves the demolition of three buildings and the construction of two new buildings that will house ultraviolet light treatment equipment. The City must complete this project to maintain its filtration avoidance waiver for the Skaneateles Lake Water supply. This waiver exempts the City from building water filtration facilities as long as the City follows specific watershed rules and regulations and institutes successful water quality protection programs. Construction is expected to be completed by autumn of 2014.[57]

During 2011, the total amount of water entering the City of Syracuse water system was 10,984 million gallons (30.096 MGD). 12,964 million gallons (35.52 MGD) was withdrawn from Skaneateles Lake and 188.49 million gallons (0.516 MGD) came from Lake Ontario (Metropolitan Water Board).

City of Oswego

The Oswego Water Department is responsible for providing potable water to the City, as well as the Town of Scriba. The City water source is Lake Ontario, in conjunction with the facilities of the Metropolitan Water Board. The distribution system includes a 10 million gallon finished water-covered reservoir. Treatment includes disinfections, filtration, and fluoridation. The Oswego water system serves approximately 29,400 people, including residential, commercial, and industrial uses. This is made possible through over 8,000 service connections. Total water produced in 2002 was 2.9 trillion gallons.

The City of Oswego is under a consent decree from the U.S. Federal Government for violations of Section 301(a) of the Clean Water Act in relation to the City's West Side sewage treatment facility and combined sewer system (CSO). The requirements of the decree include completing and implementing a Long Term Control Plan (LTCP) to address combined sewer overflow (CSO) correction and abatement, stormwater management, and pretreatment program elements. The city is currently implementing a comprehensive overhaul of its combined sewer system (CSS). The consent decree requires that over seventy-five percent of the city's CSS be separated by 2021. The total cost to the city is estimated to total over $87 million. The city is also pursuing green infrastructure alternatives to meet the requirements of the consent order.

City of Fulton

Drinking water for the City of Fulton originates from 10 groundwater wells, as well as treated surface water from Lake Ontario through a connection to the MWB. The OCWA source is received already filtered and treated, and it is used to supplement groundwater sources, as needed, to meet system demand. Of the 10 groundwater wells owned and operated by the City, two are located on the Water Works property, two are located on Co Rt 57 south of the Water Works property and six wells are located at the Great Bear well field. The Fulton Water Department, a division of the Department of Public Works, maintains approximately 66 miles of water main lines and 555 fire hydrants.

TABLE 9–Community Water Suppliers Within Cortland-Homer-Preble Aquifer System Source: Cortland County Health Department.

Supply	Population Served	Water Usage (gallons per day)
City of Cortland	20,100	3,792,000
Cortlandville	2,700	413,600
Homer	4,250	717,800
McGraw	1,300	87,900
Scott	154	9,341
Preble	51	3,200
Green Acres MHP	32	2,000
McBride MHP	54	3,400
Mountainview MHP	86	5,400
Parker Manor MHP	64	4,000
Pine Hill MHP	253	16,000
Ripley Hill MHP	64	4,000
Tully MHP	333	13,672
TOTAL	29,441	5,072,313

(MPH = Mobil Home Park)

TABLE 10–Private Well Information within Cortland-Homer-Preble Aquifer System

Town	Estimated Population	Estimated Water Usage (gal/day)
Cortlandville	2,700	270,000
Homer	1,575	157,500
Preble	860	86,000
Scott	140	14,000
TOTAL	5,275	527,500

City of Cortland

The City of Cortland provides public water throughout the entire City, and has done so since at least the early 1900s. The public water supply serves the residents and businesses within its limits, but also has emergency connections to several other municipalities. The City also provides water to portions of the Town of Cortlandville via an intermunicipal agreement (see Table 9). The source of the City's water is a group of three ground wells with production capacities of 2,300 gallons per minute (GPM), 3,600 GPM, and 3,000 GPM. Each of the wells draws from the highly productive Cortland-Homer Preble Sole Source Aquifer which is part of the entire Homer-Cortland valley and its typical sand and gravel deposits.

There is more than sufficient water capacity to meet the present needs of the City. The average daily usage for the City is typically 2.0 million gallons per day (GPD), with a range of static pressure between 35psi (SUNY college hill and Ridgeview Avenue) and 85 psi in all other areas within the City. There are three storage tanks serving the system. One is a three million gallon concrete tank located on Saunders Road in the Town of Cortlandville. The other two are 1.25 million gallon (each) steel bolted tanks located on the SUNY campus. The storage tanks are served directly by 24" transmission mains from the wells. The City's wells are in one location, which makes the City's water supply vulnerable. An alternate, back-up location may need to be identified.

An issue of prime importance that has received recent attention is the protection of the aquifer recharge area. A recent source water assessment of the system by the NYS Health Department concluded that the City's supply is "highly susceptible" due to the highly permeable nature of the aquifer, and the close proximity of land uses and activities to the wells. Unfortunately, much of the recharge area is located outside the City in the Town of Cortlandville.

The City has little or no influence on development in the Town that my negatively impact its water source. The City needs to work closely with the Town of Cortlandville in order to ensure the long-term safety of the water supply (see also Section II. Natural Resources). All of these issues must be reviewed in conjunction with any anticipated growth and development in specific locations within the City, so that adequate plans can be prepared to meet those potential future demands.

City of Auburn

The drinking water source for the City of Auburn and surrounding communities is Owasco Lake. Water is provided through a single 30-inch intake line that extends over 1,800 feet into the lake. The City's allowable withdrawal from Owasco Lake is 15 million gallons per day (mgd).

The city of Auburn water system serves approximately 27,179 (2010 census) Auburn residents through 8,800 service connections. Water from the City of Auburn is also distributed to areas within the Towns of Sennett, Fleming, Throop, Brutus, Montezuma, Springport, and Aurelius as well the Villages of Port Byron and Weedsport, and the Cayuga County Water Authority and the Thruway Authority. In total, Auburn supplies close to 45,000 people in Cayuga County with drinking water. The daily average of water treated and pumped into the distribution system is 4.8 million gallons per day. It is estimated that approximately 27.16 percent of the total water produced is lost due to leakage, used to flush mains and wash streets, fight fires and for internal use at the Water Filtration Plant, as compared to 45 percent in 2006

Owasco Lake is classified as a Class-AA Special water body designated by the New York State Department of Environmental Conservation (NYSDEC) as listed in 6 NYCRR Part 702. It is considered an excellent source of potable water, and must be protected.

City of Oneida

The City of Oneida drinking water supply is from Glenmore Reservoir on Florence Creek, which is located twenty miles north of the City in the Town of Annsville, Oneida County. The dam impounds water from a 13.8 square mile watershed on the edge of the Tug Hill Plateau. The 378-foot long and 45-foot high dam, constructed in 1926, provides water storage to buffer seasonal water demands as well as dry weather supply. The reservoir holds 299 million gallons of water. The City owns the 500-acre site on which the reservoir and dam are located.

Oneida's Florence Creek Water System was constructed in 1926. In early 1980, the City's current water treatment plant was completed to provide filtration to the City's upland supply, for the first time correcting problems of taste, odor and color. Today the City of Oneida Water Department serves almost 21,000 people and provides an average daily water supply of 2.2 million gallons (2.2 MGD).

A 20" cast iron main transports the water from the clearwell tank into the City. A pump station at Lake Street increases the capacity of the 20-mile pipeline from 2.8 MGD to 3.5 MGD with one pump operating. The water is distributed through a network of 80.8 miles of cast iron, asbestos cement and ductile iron water main throughout the City. Two domed concrete storage tanks have a combined capacity of 15 million gallons and are used to balance pressure in the distribution system and to ensure an adequate water supply for fire protection. A chlorination facility is located at the site to further treat all water leaving the tanks.

Wastewater Infrastructure – Existing Conditions

There are 43 wastewater treatment plants currently operating in Central New York. The age of these plants ranges from 8 to 88 years. Approximately 79 percent of the waste water treatment plants in Central New York are over 30 years old and have reached or exceeded their expected useful life and therefore pose a threat to quality of the waters they discharge into (Figure 9). 28 plants employ secondary treatment technology and 43 plants employ tertiary treatment technology. The NYS DEC database "Descriptive Data of Wastewater Treatment Plants in New York" indicates that only 23 percent of municipal wastewater treatment plant equipment is more than 30 years old statewide. Aging wastewater infrastructure is tied directly to the quality of the region's waters. A 2004 DEC study documented the correlation between wastewater infrastructure and water quality.[58]

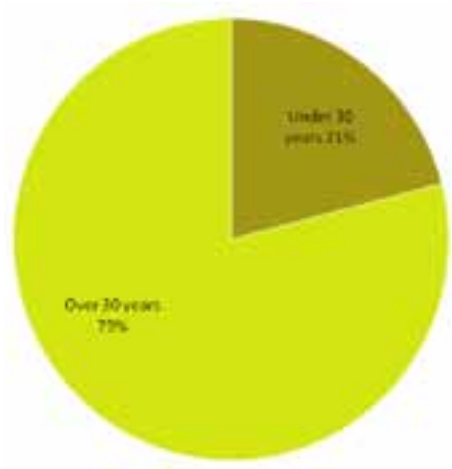


FIGURE 9–Percentage of Wastewater treatment facilities beyond 30 years of age in Central New York

Aging infrastructure is most prevalent in the City of Syracuse, the small cities within the region including Auburn, Cortland, Oswego, Fulton, and Oneida, as well as some older towns and villages. As this infrastructure continues to age and requires more maintenance and replacement, the costs associated with this infrastructure will continue to rise. These high costs may be particularly burdensome for the municipalities with lower-income residents and higher percentages of tax exempt properties, such as the City of Syracuse (see Table 11).

Additionally 14 percent of the region's wastewater treatment facilities fall within the Chesapeake Bay Watershed and will be required to meet stringent new standards imposed by the Federal Government that will have costly impacts to local governments.

A few municipalities within the region (i.e. Onondaga County, City of Syracuse, and City of Oswego) are also working to address the impacts of combined storm water and sanitary sewers that contribute to nutrient loading, waterborne pathogens, and other contamination in the region's waterways.

TABLE 11–Wastewater treatment facilities in Central New York

County	Plant	Year	Design Flow (MGD)	Collection System*
Cayuga				
	Auburn	1937	12	sc
	Moravia	1971	0.6	c
	Union Springs	1960	0.33	s
	Aurora	1971	0.3	s
	Weedsport	1966	0.3	s
	Port Byron	1966	0.285	s
	Cayuga V	1964	0.1	s
Cortland				
	Cortland LeRoy/ Summerson	1940	9	s
	Marathon	1976	0.063	s
	Cuyler	1977	0.01	s
Madison				
	Oneida	1924	2.5	s
	Canastota	1959	1.73	c

County	Plant	Year	Design Flow (MGD)	Collection System*
Madison (cont'd)				
	Madison Cty SD/Cazenovia	1977	0.95	s
	Hamilton Village	1968	0.85	s
	Chittenango	1985	0.8	s
	Morrisville	2003	0.18	s
Onondaga				
	Onon. Metro	1960	80	c
	Onon. Oak Orchard	1968	10	s
	Onon Baldwinsville	1983	9	sc
	Onon. Meadowbrook	1969	6.5	s
	Onon. Wetzel Rd	1959	3.5	s
	Onondaga Lake Shore (Brewerton)	1971	3	s
	Minoa	1937	0.9	s
	Skaneateles	1983	0.66	s
	Central Square V	1996	0.45	s
	Marcellus	1959	0.38	s
	Tully	1970	0.226	s
	Jordon	1983	0.16	s
	Onon. Harbour Heights	1966	0.15	s
	Lysander/ Lyonsdale	1989	0.017	s
Oswego				
	Oswego (eastside)	1971	5.35	c
	Oswego (westside)	1939	4	sc
	Fulton	1967	3.4	s
	Pulaski	1971	0.65	s
	Phoenix	1964	0.6	s
	Mexico	1976	0.3	s
	Minetto	1972	0.2	s
	Cleveland	1991	0.15	s
	Parish	1979	0.14	s
	Hastings (Ft. Brewerton)	2004	0.125	s
	West Monroe Big Bay	1989	0.056	s
	Hastings (Caudenoy)	1986	0.029	s
	Oswego Sleepy Hollow	1998	0.007	s
* S = Separate; C = combined				

The majority of wastewater infrastructure within the region is located in Onondaga County and is managed by the Onondaga County office of Water Environment Protection (WEP). WEP has been experiencing rising user costs associated with expansion of the sewer system, as well as managing upgrades to the existing system. The most notable projects are associated with Onondaga County's response to the Amended Consent Judgment (ACJ) which ultimately are aimed at improving water quality in Onondaga Lake. Among the ACJ projects are upgrades to the Metro Wastewater Treatment Facility located on the shore of Onondaga Lake, as well as sewer system upgrades within the city of Syracuse including sewer separation and the Midland Avenue Regional Treatment Facility, underground storage facilities along Onondaga Creek and in Armory

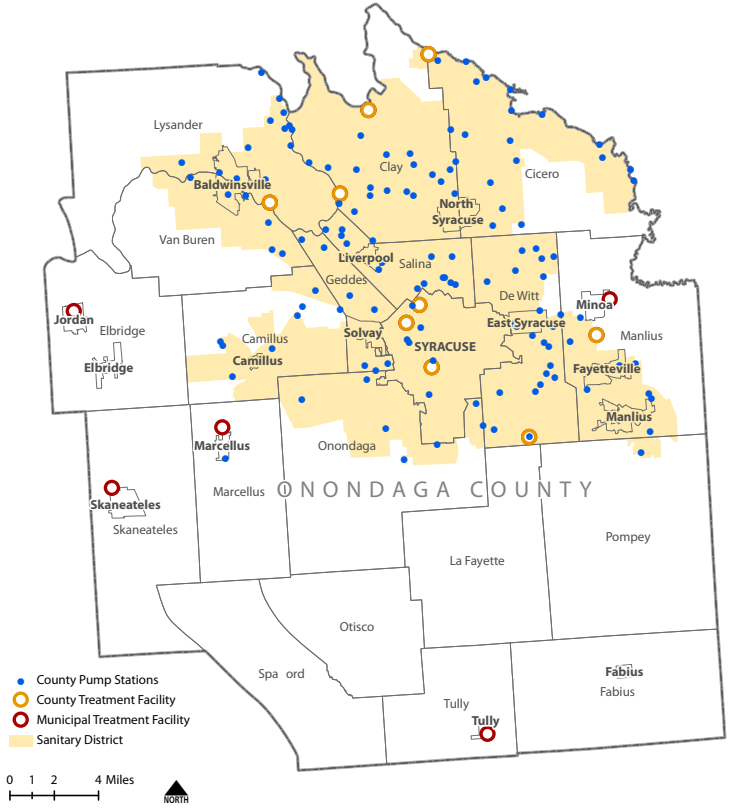
Square, and green infrastructure projects associated with the County Save the Rain program. The Onondaga County Sewer Unit charge has increased from $67.06 per unit in 1982 to $358.68 per unit in 2012.

From 2001 – 2011, 39 miles of municipal sewers were added in the County; and the Onondaga County Consolidated Sanitary District has added 12,550 acres since 1998. All of this expansion in has occurred without accompanying population growth. The County's population is dispersing and redistributing around the County, often into previously undeveloped areas without existing infrastructure.

Additionally, although Onondaga County is responsible for wastewater treatment, it does not hold ownership of all sewer lines in the County and thus has minimal control over the addition of new lines to the satellite municipal systems that are tributary to the County owned infrastructure. This has resulted in a lack of consistent construction standards due to the fragmented nature of the system.

In addition to expansion of wastewater pipes and treatment facilities, the County has also seen an increase in the number of pumping stations for new developments as locations that could take advantage of a gravity system have largely been developed. In Onondaga County, pumping for wastewater disposal was not commonly used until the 1960s, as most sanitary sewer systems used gravity sewer systems for waste conveyance. Wastewater pumping stations operated by WEP increased from 120 to 151 between 2001 and 2011, an increase of 21 percent, while at the same time, the number of properties supporting these wastewater systems has dropped 2 percent from the peak number of units in 2002.

MAP 7– Onondaga County Sanitary District Wastewater Treatment Facilites and Pumping Stations



MAP 8– Onondaga County Sanitary District Change 1968 - 2002

Drinking and wastewater infrastructure Issues and Trends

The American Water Works Association conducted an analysis of 20 utilities nationwide in 2001 and projected that expenditures on the order of $250 billion over 30 years might be required nationwide for the replacement of worn out drinking water pipes and associated structures (valves, fittings, etc). This figure did not include wastewater infrastructure or the cost of new drinking water standards. The analysis also pointed out a growing conflict between the need to replace worn-out infrastructure and the need to invest in compliance with new regulatory standards under the Safe Drinking Water Act. Concurrent demands for investment in wastewater infrastructure and compliance with new Clean Water Act regulations, including huge needs for meeting combined sewer overflow (CSO) and stormwater requirements, will compete for revenue on the same household water bill.[59]

Water and wastewater treatment facilities require significant energy to power pumps, aeration systems, treatment, conveyance and other operations. Drinking water and wastewater services account for an estimated 3 percent of national energy consumption. The national average energy consumption for wastewater treatment facilities is 1,200 kWh per million gallons (MG) of wastewater generated (1 MG of wastewater is generated by 10,000 people per day). NYSERDA conducted a statewide energy assessment of the water and wastewater sector in New York State and found that it consumes 2.5 to 3 billion kWh/year (approx 2 billion kWh/year for wastewater treatment and 1 billion/year for drinking water). The sector spends between $250 and $300 million per year, and savings of ten to fifteen percent are easily achievable.[60]

Energy efficiency and renewable energy technologies such as solar electric or anaerobic digesters to capture biogas, can reduce energy use, energy costs, and greenhouse gas emissions. Energy efficiency improvements at water and wastewater treatment facilities can have high rates of return, and can significantly reduce overall costs at a facility since energy costs typically constitute 25-30 percent of the operations and maintenance costs at water & wastewater facilities. In some cases, clean energy coupled with a change in process technology can result in even more benefits including increased treatment efficiency, potential for increased treatment capacity, and better capability to meet effluent standards.

Fortunately water supply and wastewater treatment facilities in New York State can benefit from participation in NYSERDA programs to improve energy efficiency, they may also benefit from utility sponsored programs such as lighting retrofits. **New York State has made available $57 million in funding to support the installation and operation of anaerobic digester gas-to electricity systems through 2015, which would be a good fit for many of the region's treatment plants.** Through a comprehensive survey of New York's wastewater treatment facilities NYSERDA discovered that treatment facilities that have participated in energy efficiency programs tend to be more energy efficient than their non participating peers.

By determining baseline energy use, wastewater, and water, utility managers and operators can better understand their electricity provider's rate structure and how their current operations impact energy costs within that structure. Further, energy-intensive processes such as pumping and aeration can be identified and prioritized for improvement. Wastewater systems can also benefit from inflow and infiltration (I/I) reductions through the implementation of green infrastructure practices that separate stormwater flow from the sanitary system, thus reducing the amount of water that needs to be treated.

Reducing leaks within a water supply system has the additional potential for significant energy savings. The actual energy savings achieved by reducing leaks will depend on the overall energy intensity of the system and how far down the water supply chain the leak occurs. Embedded energy accumulates as water moves down the supply chain. For instance, water saved at the local distribution stage will embody the energy of all previous stages, including treatment and conveyance. But water saved during conveyance will not have been embodied with the energy of later steps. Water is heavy at 8.34 pounds to the gallon and energy is required whenever it is moved, treated, heated or pressurized. For many communities, the energy required for supplying and treating water and wastewater constitutes the largest municipal energy cost.[61] Public use and lost water is unaccounted for and represents 15 percent of all public water demands, a staggering volume that should be better tracked in order to minimize lost water.

A generally accepted estimate for water lost due to supply system leakage is estimated to be on the order of 10 percent of total supply, or 5.48 billion gallons daily. It is believed that an aggressive national program aimed at reducing system loss could achieve a 5 percent reduction in leaks, equal to 0.5 percent of total water supply.83 This effort would save 270 MGD of water and 313 million kWh of electricity annually, equal to

the electricity use of over 31,000 homes.84 In addition, approximately 225,000 metric tons of CO2 emissions could be avoided.[62]

Water access can be expanded much more quickly and inexpensively through efficiency than new infrastructure, deferring the need for additional infrastructure investment. Also, water and wastewater investment decisions that neglect energy efficiency have a domino effect that increase investments in other sectors, such as power plants, investments to extract and transport the additional fuel, and the environmental costs associated with air emissions and declining water and hydrocarbon reserves. A development agenda that maximizes the capacity of existing infrastructure through efficiency before encouraging new construction is the most cost-effective and sustainable way to meet the growing need for clean water. By incorporating efficiency into existing and planned infrastructure systems, costs can be controlled, service delivery can be improved and access expanded without necessarily adding to the cost of the service.[63]

The principal law governing pollution of the nation's surface waters is the Federal Water Pollution Control Act (FWPA) (currently referred to as the Clean Water Act). Recognizing the threat that dirty water posed to the public health and welfare, Congress enacted the Act in 1948 to "enhance the quality and value of water resources and to establish a national policy for the prevention, control and abatement of water pollution." The FWPA established a 55% cost sharing mechanism to states and municipalities for the construction of waste water treatment plants. Many of the waste water treatment plants operating in CNY were made possible through this funding.

The Clean Water Act authorizes grants to capitalize State Water Pollution Control Revolving Funds, or loan programs for constructing municipal sewage treatment plants and other types of water quality improvements projects. States contribute matching funds, and under the revolving loan fund concept, monies used for wastewater treatment construction are repaid to the state and made available for future construction in other communities.

The NY Clean Water State Revolving Fund (CWSRF) is the primary funding source for water quality protection projects including wastewater treatment infrastructure projects. The NY Drinking Water State Revolving Loan Fund (DWSRF), makes funding available to drinking water systems to finance infrastructure improvements. Both programs are managed by the New York State Environmental Facilities Corporation (EFC) with an annual budget of $20 million. Together, the low interest loans available under the CWSRF and the DWSRF are the primary funding sources for needed infrastructure improvement projects in NYS.

The EFC is a national leader in providing financing for drinking water, wastewater treatment, and water quality protection. EFC has begun to promote energy efficiency for all of the projects that it supports through financing and is working with NYSERDA to fund energy efficiency studies and modifications for facilities. At the same time the needs far outweigh available funding, in 2009 the CWSRF need was identified at $4.5 billion, while available funding was $740 million. In 2008 the DWSRF need was identified at $1.9 billion, while available funding was $162 million.

Additionally EFC has begun to promote and reward municipalities for incorporating smart growth into their planning processes for infrastructure expansion. User costs rise for rate-payers when redistribution of flow to new areas increases localized demand for sewer capacity (e.g., at a particular treatment facility) and necessitates subsequent upgrades in service areas that may not have adequate conveyance and treatment capacity to handle increased flows. As a result, rate-payers must concurrently fund projects to add new capacity as well as increase capacity of existing infrastructure and treatment facilities to subsidize new development, while continuing to incur the costs of operating and maintaining aging infrastructure in areas that are already developed.

Additionally, pumping wastewater requires a substantial upfront investment and continual operation, maintenance and utility costs. Pumping stations typically require a major renovation after 20 years of service and require full replacement after 40 years of service. The costs associated with pumping stations are borne by the residents within the benefit district that owns the infrastructure, which often is comprised of a single residential subdivision. When pumping stations are installed for a subdivision that is planned to be constructed in multiple phases over several years, a small number of first-phase residents may be faced with extremely high costs, particularly if the subdivision is never fully built-out or the pumping station requires major renovation or replacement.

Central New York has invested hundreds of millions of dollars over the years to build an extensive network of drinking water, wastewater and stormwater infrastructure to provide the public with safe and clean water. While some of that infrastructure is now 100 years old or older, much of this network of water treatment plants, distribution lines, sewer lines and storage facilities was built after World War II. While the larger water systems within the region have been working hard to move toward greater infrastructure sustainability, the level of renewal and reinvestment

within the water sector (especially for smaller service providers) has not kept pace with the need. This leaves the region with a burgeoning gap between what needs to be spent to achieve a sustainable pace of renewal and the revenues available to support those needs.

Historically, the region (and the nation) has underinvested in the ongoing need to maintain and renew these systems. Over the coming decades, the pattern of underinvestment must change to put practices in place that ensure that this infrastructure and the utilities that provide the Central New York region with water services, are sustained for the long term. Doing so is vital to the health of the regional economy, the public at large, and to that of the region's water resources.

When wastewater infrastructure is beyond its design life it operates at reduced levels of efficiency, and this has negative impacts on the water quality of receiving water bodies. Water quality declines are often caused by nutrient loading from stormwater runoff as well, this is especially true for older combined sewer systems where stormwater and sanitary waste combine and often proceed untreated into the receiving water body. The following graph shows that municipal wastewater treatment plants discharges, CSOs and urban stormwater runoff are the primary sources of impairment for newly identified impaired waters (figure 9).

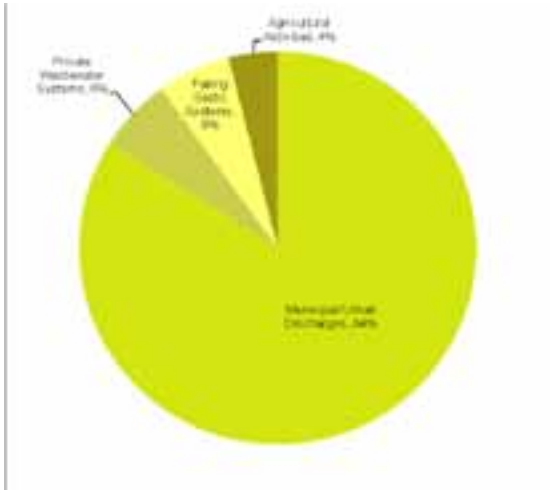


FIGURE 10–Sources of Impairment for Waters Newly Added to 2008 NY List of Impaired Waters

Water utilities typically have a long-term planning horizon and long-term infrastructure operation and maintenance commitments. The costs and potential benefits of investment decisions will be realized over a long period of time. Accordingly, the U.S. Environmental Protection Agency (EPA) has established a Sustainability Policy that calls on drinking water and wastewater systems to undertake "robust and comprehensive" planning to ensure that water infrastructure investments are cost-effective over their lifecycle, resource efficient, and consistent with other relevant community goals. Throughout the Policy, EPA emphasizes the important relationship between utility and community sustainability.

In 2006 EPA rule Long Term 2 Enhanced Surface Water Treatment (LT2) took effect for systems serving more than 100,000 in population, with other systems coming on-line through 2008. The purpose of the LT2 rule was to reduce disease incidence associated with **Cryptosporidium** and other pathogenic microorganisms in drinking water supplies. The rule applies to all public water systems that use surface water or ground water that is under the direct influence of surface water. The rule was meant to bolster existing regulations and provided a higher level of protection of drinking water supplies by:

+ Targeting additional **Cryptosporidium** treatment requirements to higher risk systems
+ Requiring provisions to reduce risks from uncovered finished water storage facilities
+ Providing provisions to ensure that systems maintain microbial protection as they take steps to reduce the formation of disinfection byproducts
+ This combination of steps, combined with the existing regulations, was designed to provide protection from microbial pathogens while simultaneously minimizing health risks to the population from disinfection byproducts.

Combined Sewer Overflows

In 1994, EPA adopted a CSO policy requiring that states address wet weather, raw sewage and discharges from municipal sewers.[64] In 2000, Congress amended the CWA to include the Wet Weather Act of 2000 that adopted EPA's policy into law.[65] At the time, Congress recognized that the adoption of a program to address CSOs would be very costly to municipalities. Congress authorized funding of $1.5 billion for pilot projects and infrastructure design and construction. [66] None of the federal funding has been appropriated to date. [67]

New York State has adopted a CSO control program that includes fifteen best management practices. Key components include the requirement to capture and treat 85 percent of wastewater during wet weather events and the prohibition of any water quality standard violation.

CSOs are often found in municipalities with older sewer collection systems. Because CSOs contain untreated domestic, commercial and industrial wastes as well as surface runoff, many different types of contaminants can be present. Contaminants may include pathogens, oxygen demanding pollutants, suspended solids, nutrients, toxics and floatable matter. Because of these contaminants and the volume of the flows, CSOs can cause a variety of adverse impacts on the physical characteristics of surface water, impair the viability of aquatic habitats, and pose a potential threat to drinking water supplies. CSOs have been shown to be a major contributor to use impairment and aesthetic degradation of many receiving waters and have contributed to shellfish harvesting restrictions, beach closures and occasional fish kills.

ENERGY INFRASTRUCTURE

Energy Supply and Transmission

Central New York is a major contributor to New York's total energy generation. The Central New York Region generates approximately five times its annual consumption. This is largely due to Oswego County being the home to three of New York's six operating nuclear reactor units. The annual generation from these three reactors alone is 20.6 thousand MWh, or 15% of New York State's total annual electrical generation. Five of the state's six operating reactors were commissioned in the 1970s with the in-service date or Nine Mile Unit Two occurring in 1987. Since that time, no additional reactors have gone into service in Central New York, although the existing units have increased their capability from efficiency "upratings" over the past several years. Oswego County's nuclear assets have received license extensions: Nine Mile Point Unit 1 (2029), Nine Mile Point Unit 2 (2046), and James A. FitzPatrick (2034).

Installed Capacity and Generation*
2010 by County

	Cayuga	Cortland	Madison	Onondaga	Oswego	Total
Total Capacity (MW)	5.4	-	6.2	280.9	5,294.6	5,587.1
% of Total	0.1%	0.0%	0.1%	5.0%	94.8%	100.0%
Total Generation (GWh)	0.4	-	135.0	483.4	24,468.3	25,087.1
% of Total	0.0%	0.0%	0.5%	1.9%	97.5%	100.0%

* Unit nameplate load
2011 NYISO Gold Book

It is also noted that a sizable installed transmission capability resides in the Central New York region that facilitates the movement of energy to markets. The CNY region sits at the transmission crossroads for energy that is not only produced here, but for energy that flows from Western New York as well (Figure x.x.). Several different entities that provide transmission services across CNY: New York Power Authority (NYPA), New York State Electric and Gas Corporation (NYSEG), National Grid, Rochester Gas and Electric Corporation (RGE), and four municipal owned utilities. National Grid owns the majority of transmission lines

in Oswego, Cortland, and Onondaga Counties, with the remainder serviced by NYSEG. Cayuga County is principally served by RGE and NYSEG. Madison County is serviced almost evenly by National Grid and NYSEG. Because transmission is quantified by NYISO zones which do not correspond to county lines, it is difficult to determine exactly how much transmission mileage is installed across the CNY region, but of the 11,500 miles across New York State, it is estimated that 720 of those miles (or 6.26%) are within the five county CNY region.

The New York State Transmission Assessment and Reliability (STARS) report released on April 30, 2012 noted that the last major cross-state transmission project was built in the 1980s, and 85% of the state's transmission lines were built before 1980. It also concluded that nearly 4,700 miles of transmission, almost half of all circuitmiles of 115/138kV lines and nearly three quarters of all 230 kV, will face the end of its useful life and may require replacement in the next 30 years (Table 3). The STAR report highlights the location of the transmission infrastructure challenges (Figure 7). The STARS report also recommended the need to support local upgrades in support of wind generation to improve deliverability of energy from projects already under development.

Similarly, the capacity weighted age of generation in the Central New York region is 30.2 years, which is significantly skewed since many of the larger capacity additions (nuclear and natural gas) were added in the last 30 to 40 years. Some of the region's oldest generation (hydroelectric) facilities are reaching 100 year milestones, although many have been rehabilitated during relicensing (Table 12).

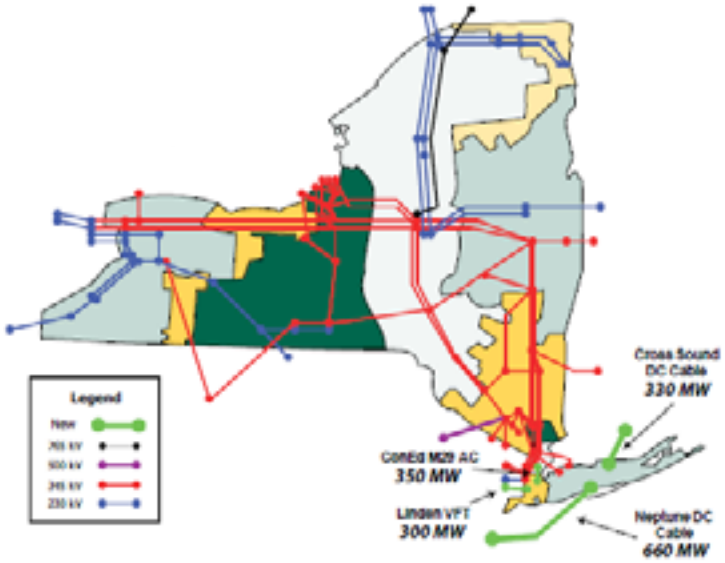


FIGURE 11–Transmission Capability Added Since 2000 in New York State 1,640 MW

TABLE 12–Central New York Generation by Location, Size, Production, and Age

County	Town	Station	Unit	In Service Date	Type	Capacity (MW)	Production (GWh)	Age
Cayuga	Auburn	Auburn - Mill St		1921-12-01	WAT	-	-	89.9
		Auburn - No. Div St		1902-12-01	WAT	-	-	108.9
		Auburn - State St		1905-01-01	NG	5.4	0.4	105.8
	Moravia	Mottville Falls		1902-08-01	WAT	-	-	109.3
Madison	Brookfield	Munsonville Wind Power		2007-09-27	WND	3.8	9.4.7	5.0
	Fenner	Fenner Wind Power		2001-12-01	WND	-	30.9	10.7
	Madison	Madison Wind Power		2000-09-01	WND	1.2	10.0	11.8
	Wampsville	Madison County LF		2010-03-01	MTE	1.6	8.2	2.4
Onondaga	Dewitt	Carr St. E. Syr		1953-08-01	NG	88.8	28.0	59.9
	Syracuse	Project Orange 1 (Ret. - 11/13/10)		1892-06-01	NG	-	55.5	29.2
		Project Orange 2 (Ret. - 11/12/10)		1892-06-01	NG	-	78.3	29.2
		Syracuse		1993-08-01	NG	87.0	45.5	18.9
		Syracuse Energy ST1		1991-08-01	BIT	11.0	105.7	21.9
		Syracuse Energy ST2		1991-08-01	BIT	62.8	-	21.9
	[blank]	Gatlerville 1		1927-01-01	WAT	0.3	1.4	85.8
		Gatlerville 2		1927-01-01	WAT	0.3	0.7	85.8
		Nottingham High School		1998-06-01	NG	-	-	24.3
		Onondaga County		1994-12-01	BIT	22.4	106.3	17.7
		Onondaga Energy Partners		1987-12-01	MTE	-	1.2	24.7
		Oswego IIF Partners (Phoenix)		1990-12-01	WAT	-	11.3	21.7
		Seneca Limited		1985-12-01	WAT	-	-	26.7
Oswego	Oswego	Oswego 5		1976-02-01	FOS	822.0	31.8	36.9
		Oswego 6		1980-07-01	FOS	826.0	32.9	33.1
		Oswego IC 1		1987-06-01	FO2	-	-	45.0
		Oswego IC 2		1976-02-01	FO2	-	-	36.5
		Oswego IC 3		1980-07-01	FO2	-	-	33.1
	Scriba	Nine Mile Pt 1		1969-11-01	UR	629.2	5,204.1	42.8
		Nine Mile Pt 2		1988-06-01	UR	1,141.6	8,445.0	24.0
	Oswego	Indeck-Oswego		1990-05-01	NG	46.4	9.1	22.3
	Scriba	Hiawatha 1		1970-07-01	UR	826.1	6,911.5	37.1
		Independence		1984-11-01	NG	930.8	3,510.0	17.8
	[blank]	Bennetts Bridge 1		1964-01-01	WAT	6.4	0.1	48.0
		Bennetts Bridge 2		1955-01-01	WAT	6.4	14.3	48.0
		Bennetts Bridge 3		1970-01-01	WAT	7.0	24.5	42.0
		Bennetts Bridge 4		1970-01-01	WAT	7.0	23.1	42.0
		City of Oswego (Hill)		1994-02-01	WAT	-	61.9	18.5
		Fulton 1		1924-01-01	WAT	3.8	4.3	88.8
		Fulton 2		1928-01-01	WAT	0.4	1.4	84.0
		Granby 1		1983-06-01	WAT	4.9	18.3	29.3
		Granby 2		1983-06-01	WAT	4.9	21.4	29.3
		Lighthouse Hill 1		1930-01-01	WAT	3.7	13.7	82.0
		Lighthouse Hill 2		1930-01-01	WAT	3.7	6.3	82.0
		Minetto 2		1955-01-01	WAT	1.8	7.3	57.0
		Minetto 3		1955-01-01	WAT	1.8	7.3	57.0
		Minetto 4		1955-01-01	WAT	1.8	10.0	57.0
		Minetto 5		1975-01-01	WAT	1.8	0.2	37.0
		Minetto 6		1975-01-01	WAT	1.8	10.7	37.0
		Oswego County		1986-03-01	BIT	-	4.4	26.4
		Oswego Falls E 1		1914-01-01	WAT	1.8	7.3	98.8
		Oswego Falls E 2		1914-01-01	WAT	1.8	8.1	98.8
		Oswego Falls E 3		1914-01-01	WAT	1.8	7.2	98.8
		Oswego Falls W 4		1914-01-01	WAT	0.9	2.6	98.8
		Oswego Falls W 5		1914-01-01	WAT	0.9	2.9	98.8
		Oswego Falls W 6		2007-01-01	WAT	0.9	6.1	5.5
		Oswego Falls W 7		2007-01-01	WAT	0.9	6.6	5.5
		Varick 2		1925-01-01	WAT	2.2	0.7	88.8
		Varick 3		1920-01-01	WAT	2.2	3.8	88.8
		Varick 4		1925-01-01	WAT	2.2	2.9	88.8
		Varick 5		1920-01-01	WAT	2.2	6.2	88.8

ENERGY DISTRIBUTION AND DELIVERY

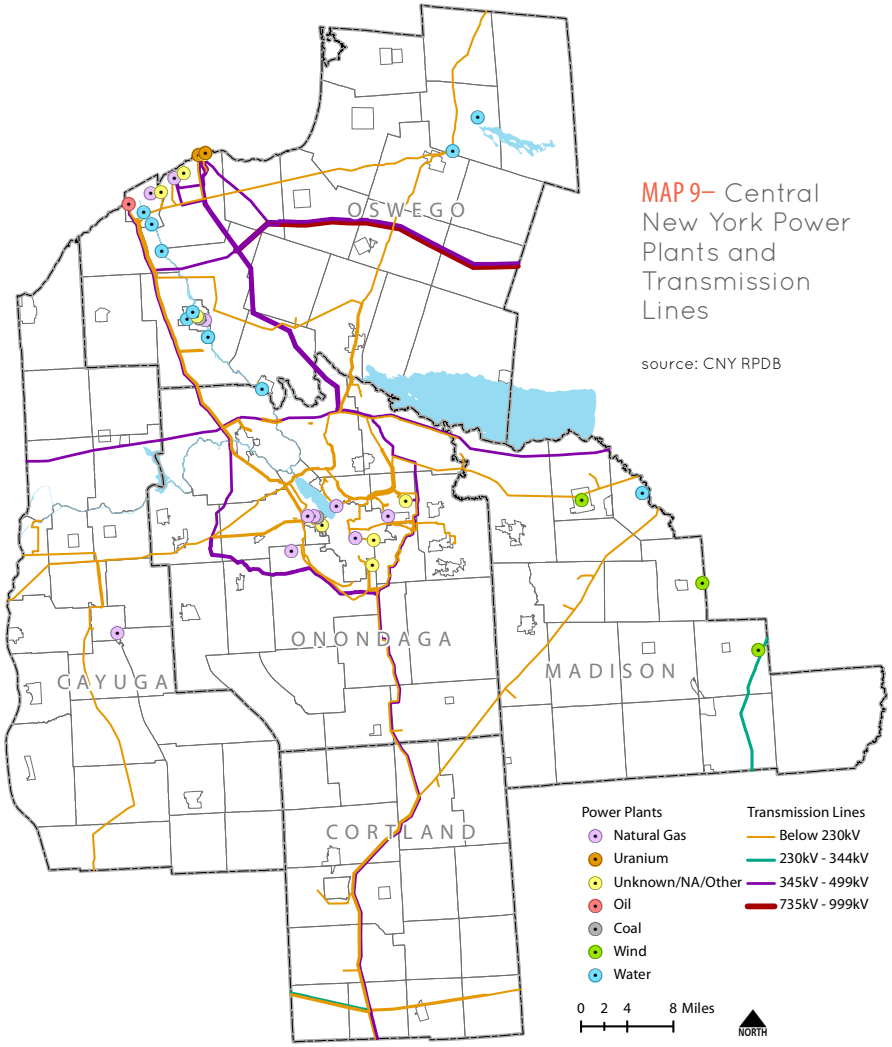
Central New York's residents, businesses, and industry receive its energy from a wide range of delivery companies. For most, National Grid and New York State Electric and Gas, provide a bulk of these services to the five county region and its population. Community based municipal energy systems deliver services in the villages of Hamilton, Skaneateles, Solvay, Marathon, along with Oneida-Madison Electric Cooperative.

While natural gas is available in all of the five counties of Central New York, it does not enjoy the saturation levels of other areas within New York State. The natural gas distribution network serves a large majority of the population and industry (including power generation) in CNY, but is less prolific in rural communities across Oswego, Madison, and Cayuga counties.

Distribution within the CNY region is classified into two different categories: radial distribution and secondary network distribution. The secondary network is only found in the areas like Syracuse and Cortland well-suited for densely populated areas because they make for efficient distribution with fewer transformers and decreased distances between end users; however, they are run underground and therefore are expensive to install. Radial lines are found in all other parts of the region, as typical power lines that are seen in neighborhoods and along the sides of roads connecting directly to the end users.

Each of the local distribution companies (LDC) has identified projects to improve the networks within their service territories. Most are designed and implemented to improve reliability through the replacement of existing facilities or to accommodate expansion or load growth in specific regions within their territory. This is because, system peak capability is being exceeded on select circuits.

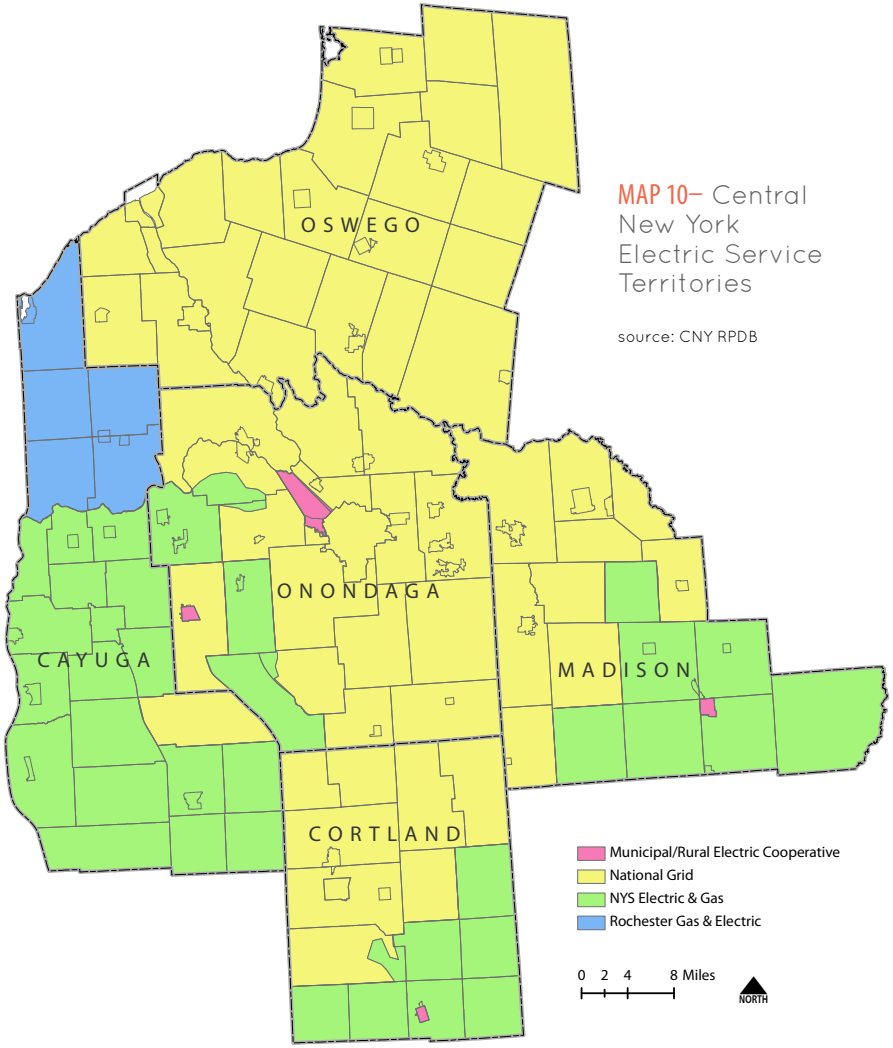
In fact, of 41 projects identified by National Grid across Upstate New York, only two are being performed to accommodate load growth, (in Western New York and the Capital Region); the 39 remaining projects are for reliability reasons. NYSEG and RGE (both utilities owned by Iberdola) have identified 256 projects across their service territories with only 17 projects, or 6.6%, located in the CNY. Detailed project information filed with the NYISO by National Grid, NYSEG and RGE is located in the inventory of utility scale energy projects and opportunities presented later in this report.



MAP 9– Central New York Power Plants and Transmission Lines

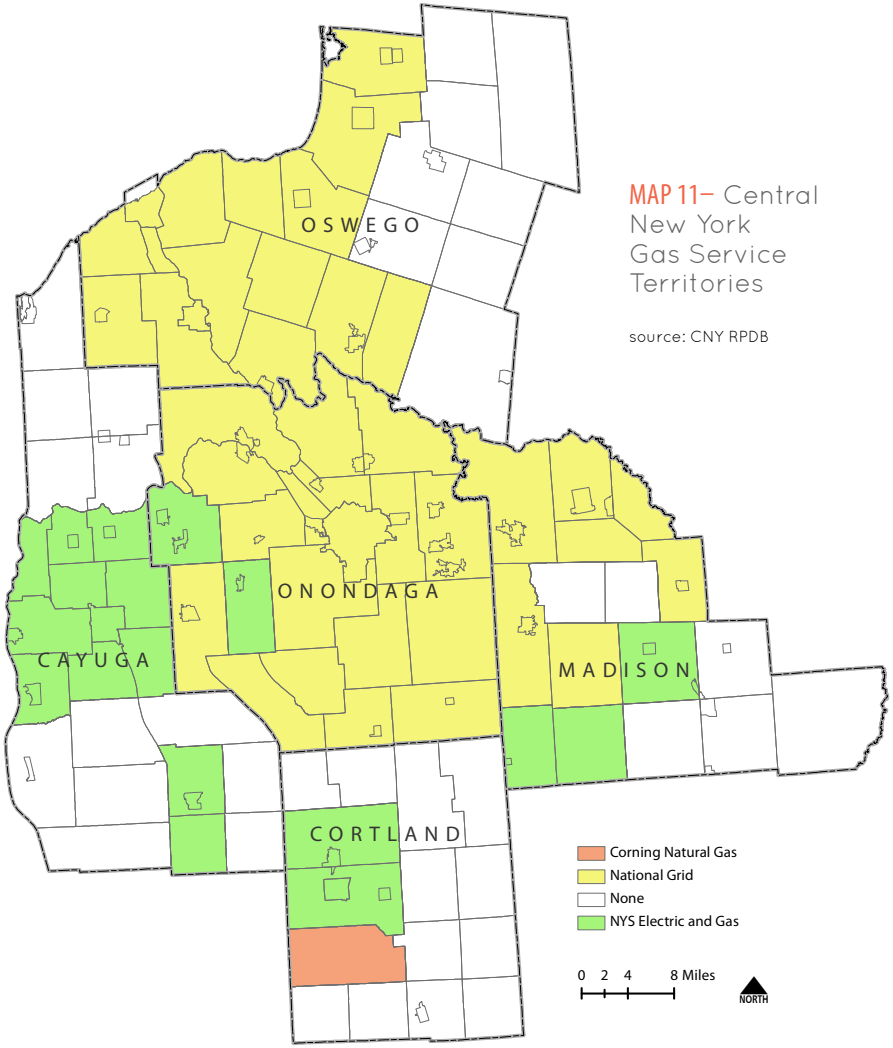
source: CNY RPDB

OF 41 PROJECTS IDENTIFIED BY NATIONAL GRID ACROSS UPSTATE NEW YORK ONLY TWO ARE BEING PERFORMED TO ACCOMMODATE LOAD GROWTH



MAP 10– Central New York Electric Service Territories

source: CNY RPDB



MAP 11– Central New York Gas Service Territories

source: CNY RPDB

IMPLEMENTATION STRATEGY

GOAL

PROVIDE SENSIBLE INFRASTRUCTURE THAT REDUCES GREENHOUSE GAS EMISSIONS, REVITALIZES EXISTING COMMUNITIES, IMPROVES THE QUALITY OF LIFE, STRENGTHENS TARGETED INDUSTRY CONCENTRATIONS, AND IMPROVES THE REGION'S COMPETITIVENESS, AND CONNECTIONS TO, THE NATIONAL AND GLOBAL ECONOMIES.

Targets

+ Increase the total percentage of people commuting via walking, biking, transit, and carpooling by 20% (over 2010 levels) by 2030.
+ Decrease the vehicle miles traveled per capita by 20% (below 2010 levels) by 2030.

Strategies

Strategy #1: Connect community destinations (schools, grocery stores, libraries, parks, shops, municipal offices) with a complete network of sidewalks, highly visible crosswalks, and bicycle lanes and/or paths.

Strategy #2: Implement transportation services, policies, projects and incentives that encourage transit-oriented development and alternative modes of travel for work, shopping and recreation (pedestrian and bicycle paths and trails, bicycle parking, printed and online bicycle path maps, bike-to-work programs, improved access to public mass transit).

Strategy #3: Develop and implement an enhanced transit strategy (i.e. Bus Rapid Transit) for select mobility corridors within the region to support increases in transit ridership.

Strategy #4: Invest in alternative fuel infrastructure such as electric charging stations, CNG stations, and biofuels.

Strategy #5: Develop and implement transportation demand management (TDM) programs in concert with large employers and municipalities that would benefit from reduced parking demand.

Strategy #6: Support and maintain "fix-it-first" state and federal transportation infrastructure policies, which favor the maintenance of existing streets and highways, as well as wastewater and drinking water facilities, over the construction of new ones, and important funding programs for historic preservation, walking and cycling facilities, and Main Street and streetscape improvement projects.

Strategy #7: Begin to strategize on national, superregional, and local freight and commuter rail systems in collaboration with other upstate New York communities and continue to lobby for support of and continued Amtrak service to the region.

Strategy #8: Develop programs that raise the awareness of, motivation for, and accessibility to pursue sustainable, low-emissions transportation choices.

Strategy #9: Provide reliable and fast access to the Internet for all of the region's residents.

Strategy #10: Invest in drinking water and wastewater treatment systems to improve efficiency and

incorporate alternative energy technologies such as wind, solar, and biodigester facilities.

Project Recommentations

1. **Upgrade pedestrian and bicycle facilities, including painted crosswalks, lighting, seating, bicycle lanes, and bicycle parking connecting downtowns, village cores, as well as university and college campuses to the neighborhoods that border them.**

    + **Project example –** Pursue a regional approach to the Connective Corridor project underway in downtown syracuse, with a focus on improving pedestrian and bicycle mobility, as well as improving the efficiency, reliability, and predictability of public transportation alternatives.

    + **Project Example -** Create a regional fund for improving bicycle and pedestrian mobility to focus on the addition of bicycle and pedestrian facilities (e.g. sidewalks, bicycle lanes, bicycle racks, crosswalks, etc.)

    + **Project Example -** Implement city-wide municipal sidewalk snow removal programs that are equitable and financially sustainable.

2. **Identify opportunties, establish partnerships to foster innovative bike share programs in high use college/university and downtown corridors.**

3. **Complete alternative transportation and recreational multi-modal facilities that are integrated with commuter facilities to decrease dependence on single-occupancy vehicles.**

    + **Project example –** Complete the Erie Canalway Trail link through the city of Syracuse and develop connections with the Onondaga Lake 'Loop the Lake' trail, as well the Onondaga Creekwalk, North Country/Fingerlakes Trail and Owasco River Multimodal Trail System in Auburn NY)

4. **Update CENTRO's long-range plan to assure that land use and transport connections are adequately employed (put the routes where they are needed, plan the routes where density will be).**

5. **Provide funds to support more sophisticated scenario planning for both corridors and regions, better predictive models that cover not only transportation outcomes but also community impacts, and tools for improved community involvement in the planning process.**

6. **Complete a streetcar or similar transit system such as bus rapid transit (BRT) that connects downtown of Syracuse, University Hill, Destiny (lakefront) and possible 4th destination (Regional Market or Hancock Airport).**

7. **Add BRT service and implement "Complete Streets" and Transit-Oriented Development (TOD) projects for targeted areas in selected corridors throughout the region (i.e., Rt 104 Corridor in Oswego; Rt 57; Rt 48; Rt 5 from Auburn to Oneida; Rt 11 from Nedrow through Salina Street in Syracuse to Cicero; James St.; and Genesee St.).**

8. Expand the frequency and reliability of CENTRO service within suburban locations to increase ridership, including park and ride lots, circulator routes and mini-hubs etc (implementation of old REMAP study elements that still make sense), develop schedules with more frequent headways, dedicated bus lanes, and improved "station areas."

9. Develop a network of at least 1,000 Level 2 electric vehicle charging stations at key locations such as major employers, retail centers and truck stops and highway rest areas throughout all five counties by 2015.

10. Develop a network of at least 10 CNG fueling stations for large public and private fleets throughout all five counties by 2017.

11. Implement Transportation Demand Management (TDM) activities to reduce dependence on single-occupancy vehicles.

    + **Project Example -** Consider transit pass programs whereby employers provide lower-cost transit passes to employees (e.g., Denver's Regional Transit District).

12. Decide on a course of action for I-81 that meets local community needs and priorities as well as NYS criteria such as cost-effectiveness, so that other local projects can move forward with certainty.

13. Upgrade Wastewater treatment facilities throughout the region to meet current treatment standards, improve energy efficiency, and implement clean energy technologies (i.e., methane digesters, solar pv, and combined heat and power systems).

14. invest in existing drinking water systems to improve system efficiency, reduce leakage, and prevent system failures.

15. Improve freight rail infrastructure to increase the use of rail to move goods within and through the region.

16. continue to improve capacity at the Port of oswego to facilitate movement of goods through the port.

17. Improve passenger rail infrastructure to increase speeds along the Empire Corridor to improve service between Central New York, NYC, and Canada.

18. Support the creation of a Finger Lakes Railway Passenger Station in Auburn located near the current rail crossing on North Street to create another Auburn gateway for exploring the Finger Lakes by rail.

19. Develop and implement a regional communications strategy to encourage residents of the region to adopt alternative transportation forms, as opposed to Single Occupancy Vehicles (SOV's).Create new transit maps and assure their easy use and availability on the Internet, in libraries, and at stations, combine maps with Next Bus technology to improve the predictability of service.

20. Work with employers, universities, municipal governments to develop employee transit assistance programs.

(Endnotes)

1. Merriam-Webster 2012
2. American Society of Civil Engineers. America's Infrastructure Report Card. 2009.
3. Source: www.infrastructurereportcard.org/state-page/new-york. 2009-2012
4. SMTC. Long Range Transportation Plan: 2011 Update. 2011.
5. Brookings Metropolitan Policy Program Blueprint for American Prosperity Report: Shrinking the Carbon Footprint of Metropolitan America.
6. Ibid
7. Syracuse Metropolitan Planning Council Metropolitan Planning Area
8. Onondaga Citizen's League. "What Does it Mean to be Green?" Study Report. 2010.
9. Smart Growth America. New York Smart Transportation: Save Money and Grow the Economy. April 2011.
10. Ibid
11. Information referenced from the Centro Website : http://www.centro.org/Regional.aspx.
12. Finger Lakes Railway, Passenger Services, http://www.fingerlakesscenicrailway.com/railroad.
13. Finger Lakes Railway, Passenger Services, http://www.fingerlakesscenicrailway.com/railroad.
14. Classifications essentially relate to revenue. Larger rail operators, like CSX are Class 1. They carry the most volume and highest service frequencies.
15. Information from the CSX website: http://www.csx.com/.
16. CSX New York State Fact Sheet, March 18, 2010, http://www.csx.com/index.cfm/about-csx/company-overview/state-fact-sheets.
17. New York Susquehanna & Western Railway, www.nysw.com.
18. New York Susquehanna & Western Railway, Syracuse NY, Ainsley Superior Warehouse, www.nysw.com.
19. Finger Lakes Railway, Freight Service, http://www.fglkrail.com/freight.
20. Moving Cooler: An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions. Urban Land Institute, 2009.
21. Ewing, Reid, Pendall, Rolf, and Chen, Don. Measuring Sprawl and It's Impact. 2002.
22. U.S. EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003.
23. Ewing, Reid, Growing Cooler: The Evidence on Urban Development and Climate Change Urban Land Institute/Smart Growth America 2007.
24. Polzin, Steven E., Ph.D. The Case for Moderate Growth in Vehicle Miles of Travel. 2006.
25. Ibid
26. Working Group III contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report, Climate Change 2007: Mitigation of Climate Change Summary for Policymakers
27. BTS survey
28. Wilbur Smith Associates Bellevue, Washington. Public Attitude Survey of Bicycleand Pedestrian Planning May 2007

29. Center for Urban Transportation Research (2005) Statewide Survey on Bicycle and Pedestrian Facilities. Report prepared for Florida Department of Transportation.

30. Davis & Hale. Public Transportation's Contribution to U.S. Greenhouse Gas Reduction. SAIC. September 2007

31. U.S. EPA. Measuring the Air Quality and Transportation Impacts of Infill Development. EPA 231-R-07-001. 2007

32. 2001 NHTS Poll.

33. Littman, Todd TDM Encyclopedia (ADONIS, 1999; Mackett, 2000; Socialdata Australia, 2000; Cairns et al, 2004).

34. All data from 'Modal Shift in the Boulder Valley 1990 – 2003', May 2004 for the 'City of Boulder' by the 'National Research Center Inc.'

35. Center for Transit Oriented Development, TOD 101: Why Transit Oriented Development and Why Now? 2007.

36. Center for Transit Oriented Development, Planning for TOD at the Regional Scale: The Big Picture 2011.

37. Center for Transit Oriented Development, Planning for TOD at the Regional Scale: The Big Picture 2011.

38. Pike Research, Electric Vehicle Market Forecasts. December 2012.

39. Union of Concerned Scientists, State of Charge: Electric Vehicles' Global Warming Emissions and Fuel-Cost Savings across the United States. June 2012.

40. Witt, Maggie. Alternative Fuels, Vehicle Technologies and Urban Logistics. The Sustainable Cities Conference Series: Urban Housing, Economy, and Transit

41. Goodban Belt, LLc. New York State Canal System Modern Freight-Way. NYSERDA and NYS DOT 2010.

42. Ibid

43. Ibid

44. Ibid

45. CNY RTA website

46. NYSDOT High Speed Rail Empire Corridor Project Online Briefing Winter 2011-2012

47. Ibid

48. America 2050. "High-Speed Rail in America" January 2011.

49. The central office (CO) is a facility that houses equipment used to switch both local and long distance telephone calls. Each CO is designated one or more specific 3-digit dialing codes which are used for call routing identification within an area code.

50. CNY RPDB. Central New York Telecommunications Study. May 2004.

51. New York State Broadband Annual Report 2011-2012. http://www.nysbroadband.ny.gov/

52. Onondaga County Sustainable Development Plan

53. OCWA 2011 Water Supply Statement

54. Ibid.

55. Northeast Executive.com. "Onondaga County Water Authority: The Challenge of Growth." 2010

56. Onondaga County Sustainable Development Plan

57. Source: City of Syracuse Water Department website: http://www.syracuse.ny.us/WoodlandReservoir.aspx

58. New York State Department of Environmental Conservation, "30 Year Trends in Water

Quality of Rivers and Streams in New York State." 2004.

59. American Water Works Association. "Reinvesting in Drinking Water Infrastructure" May 2001

60. Matthew Yonkin, P.E., Malcom Pirnie. Energy $mart Focus Program for NY's Water and Wastewater Sectors [Power Point Presentation] Hudson Valley Water Works Conference. August 2007.

61. "EGRID | Clean Energy | U.S. EPA." U.S. Environmental Protection Agency. 01 Available at: <http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html>.

62. Greenhouse Gas Equivalencies Calculator, EPA

63. Alliance to Save Energy. "Watergy: Energy and Water Efficiency in Water Supply and Wastewater Treatment

64. 59 Federal Register § 18688.

65. 33 U.S.C.A. § 1342.

66. 33 U.S.C.A. 1301(f).

67. New York State Department of Environmental Conservation. "Wastewater Infrastructure Needs of New York State." 2008