



INFRASTRUCTURE

Power & Utilities (see Map 10)

Unlike its more urbanized counterparts, Lewis County lacks contiguous networks of water, sanitary sewer, and natural gas services primarily due to a small, sporadic population coupled with environmental limitations. Lewis County's low population densities require extensive infrastructure investments to service customers throughout the county. This equates to higher overall service costs to consumers.

It should be noted that the information on Map 10 represents locations for known infrastructure based on available information such as maps, GIS data, and personal accounts from municipal representatives. Due to the scale and breadth of this County Comprehensive Plan, it was impractical to research and depict the full extent of utility and infrastructure penetration within each municipality.

Electricity

Electric service is by far the most ubiquitous utility throughout Lewis County. National Grid supplies electric service to most of the county, with the Municipal Commission of Boonville Electric and Water Department supplying electric service to the extreme southern portions in the towns of Leyden and Lewis. Lewis County is home to several power generation facilities, including thirteen hydroelectric facilities, one wind farm, and two cogeneration facilities.

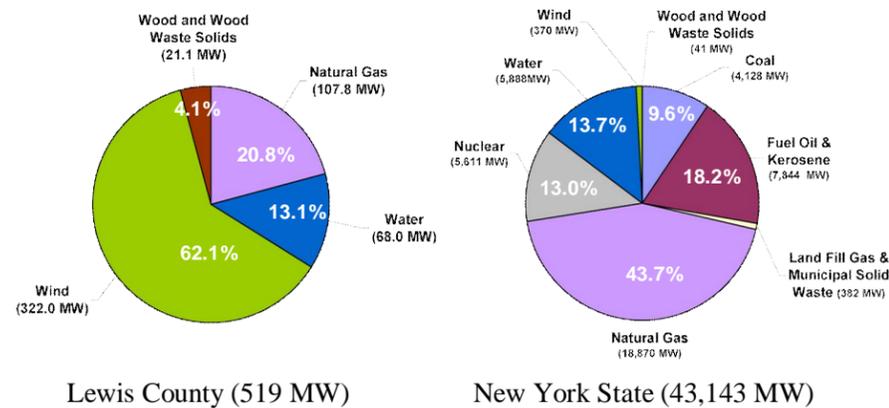
Known information regarding the four hydroelectric energy producers within the county located along the Deer, Beaver, Moose and Black rivers, includes:

- Brookfield Renewable Energy, seven facilities on the Beaver River totaling 36.8 MW;
- Algonquin Power, one facility on the Deer River and three on the Beaver River totaling 4.25 MW;
- Kruger Energy, one facility on the Black River and two on the Moose River totaling 8.5 MW; and,
- FortisUS Energy Corporation, one 12.5 MW facility on the Moose River.

In 2006, all electric generation facilities accounted for a total capacity of 518.9 Megawatts, or 1.2 percent of New York State's total (see Figure 16). Power generated at these locations is fed to the national power grid and is not necessarily utilized locally.

There are four primary transmission corridors within Lewis County. The primary of these corridors is owned by the New York Power Authority, and transects the county from north to south, supplying electricity

Figure 16: Electricity Generation Capacity by Source, 2006



Source: U.S. Energy Information Administration

generated along the St. Lawrence River to downstate consumers. The other transmission corridors in part service localities within Lewis County, creating a loop that services a majority of the Black River valley from Croghan to Leyden. There are numerous transmission facilities located throughout the county, as seen on Map 10.

Lewis County has created a Municipal Power Corporation that could potentially buy bulk electricity to provide directly to its citizens. The most recent feasibility study did not find sufficient savings in the potential purchase of bulk power by the Power Corporation. This opportunity should be revisited regularly as energy costs continue to fluctuate.

Natural Gas

The recent installation of a large natural gas pipeline from Canadian production fields south through the center of the county by Iroquois Gas Transmission System (IGTS) has greatly expanded the development of commercial/domestic gas distribution within Lewis County. There are currently two natural gas service providers within the county: St. Lawrence Gas (SLG) and New York State Electric and Gas (NYSEG). SLG has franchises in the Town of New Bremen, Town of Croghan and the Village of Croghan, while NYSEG has franchises in the Towns of Lowville, Turin, West Turin, Martinsburg, and Lyonsdale and the Villages of Lowville, Turin, and Lyons Falls. NYSEG has also installed domestic service along New York State Rte 12 from Lowville through Lyons Falls and in the Town of Lyonsdale. In this instance, Lewis County benefited from its location between Canadian production facilities and the New York metropolitan region, which is the major end user for the Iroquois pipeline.

Water and Sanitary Sewer

According to New York State Department of Health (NYSDOH) records, ten of the twelve public water supply systems in Lewis County have available capacity. Notable exceptions include the Village of Port Leyden and the Village of Croghan which exceed available capacity during periods of peak flow (see Tables 18 and 19). The Village of Lowville has the greatest excess capacity in terms of actual supply, with approximately

Table 18: Lewis County Community Water Systems

Community/Water District	Source	System Capacity (gpd)	Peak Flow (gpd)	% Capacity Available (gpd)
Village of Castorland	two drilled wells	180,000	32,816	82%
Village of Constableville	two springs/unnamed reservoir	85,000	50,000	41%
Village of Copenhagen	two drilled wells; emergency use of Deer River	100,000	65,000	35%
Village of Croghan (also serves Beaver Falls Water District)	two gravel-packed wells	250,000	223,877	10%
Glenfield Sewer District	two drilled wells	30,000	20,000	33%
Hillside Water Users/Osceola	spring	10,000	2,000	80%
Village of Harrisville	three drilled wells	575,000	100,000	83%
Village of Lowville	Youngs Pond and two streams	1,600,000	1,100,000	31%
Village of Lyons Falls	gravel-packed wells	313,920	140,000	55%
Town of Martinsburg	five drilled wells	86,400	46,000	47%
Village of Port Leyden	two infiltration galleries	120,000	120,000	0%
Village of Turin	two drilled wells and iron filtration facility	108,000	45,000	58%

gpd = gallons per day

Source: 2009 Burley and Guminiak Comprehensive Public Water Supply Study

Table 19: Lewis County Centralized Waste Water Systems Capacity

Community	Permitted Flow (gpd)	Average Flow (gpd)	Peak 30-day Flow	% Capacity Available (gpd)
Beaver Falls	20,000	4,300	5,000	5,000*
Village of Castorland	45,000	39,000	88,000	0
Village of Constableville	39,300	31,000	39,200	0
Village of Copenhagen	110,000	97,000	174,000	0
Village of Croghan	70,000	41,500	60,000	10,000
Town of Martinsburg (Glenfield Sewer District)	60,000	39,000	86,000	0
Village of Lowville	1,800,000	1,170,000	1,700,000	100,000
Village of Lyons Falls	72,300	42,300	51,000	10,000**
Village of Port Leyden	55,000	41,300	55,000	0

gpd = gallons per day

* There is concern that the facility may not be able to treat the full design flow due to initial startup issues and the current low flows

** Lyons Falls capacity is limited due to operational concerns

Source: 2009 Burley and Guminiak Sanitary Waste Water Study

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Reserve for Map 10.

125,000 gallons per day of excess remaining. Lewis County commissioned a Comprehensive Public Water Supply Study and Sanitary Waste Water Study in 2008, receiving the final report in May 2009. The study was undertaken to determine the potential for additional sources of ground water that may provide added capacity to existing or new utility networks.

While Lowville's water system appears to be meeting demand, its sanitary sewer facility is nearing capacity, with roughly 100,000 gallons per day, or nine percent, of excess capacity remaining. In total, there are nine communities with wastewater treatment facilities, most of which appear to be nearing or at capacity (see Table 19). Map 10 denotes water and sanitary service within the inset maps along the periphery of the page.

The newest addition to the county's list of sanitary sewer providers is the Hamlet of Beaver Falls (Town of Croghan). In 2006, Beaver Falls constructed a small sewage treatment facility to service approximately 65 homes that previously discharged into the Beaver River. The reduction of effluent discharges into the Beaver River will improve water quality for downstream residents and quality of life for river users. However, this system is already near capacity, and the Burley and Guminiak Waste Water Study introduces concerns about the system's ability to meet current design capacity.

Sewage treatment capacity at most municipal facilities in Lewis County is limited to primary treatment, such as the removal of solids and grit from the effluent via sand filtration and the disinfection of the effluent by hypochlorination. Currently, Lowville is the only system providing secondary treatment via aerated lagoons that further digest waste. With these limitations in mind, future development may need to supply its own wastewater treatment, or upgrades to existing facilities may be warranted. The most current sanitary systems were constructed to address failed septic systems and direct flows into streams, creeks and rivers. The capacity of the installed systems was largely driven by funding availability, rather than required capacities for current or future flows.

The availability of water and sanitary service are two critical components to an enhanced quality of life for residents, and are also determining factors in the location and development of business and industry.

Telephone & Telecommunications

Telephone service is available throughout the county, with Frontier Communications and Verizon as the primary service providers. In addition, cell phone service is available in nearly the entire county and is continuing to expand into remote areas. In 1999, DANC embarked on the process of establishing advanced telecommunications infrastructure throughout Lewis, Jefferson, and St. Lawrence Counties. The Open Access Telecommunications Network (OATN) connects the North

Country region to carrier collocation facilities in Syracuse, and is comprised of approximately 450 miles of fiber optic cable, and 10 points-of-presence (POPs). The POPs allow service providers to connect with local customers and with services from outside of the region, and are equipped to support any type of service provider. Within Lewis County, a POP at Lowville will help local businesses and institutions become more competitive, and could attract outside investment from telecommunications intensive companies.

Alternative Energy (see Map 10)

Lewis County is home to a number of alternative energy facilities, with more planned for the future. The most prominent is wind energy, which in addition to its energy production has become somewhat of a tourist attraction. Efforts are underway to expand and improve bio-mass and methane-based facilities present in the county. Cornell University and SUNY ESF (Syracuse) are actively exploring technological advances such as the use of switch grass and willows rather than corn as a biomass source. This potential new process removes the impacts on food prices caused by corn as an input, and opens up tremendous opportunities for the use or re-use of lands that are not prime for agriculture or forestry.



Wind tower in the Town of Lowville

Wind Energy

The availability of wind energy near the pinnacle of the Tug Hill Plateau is a highly regarded asset for Lewis County and its land owners. A typical wind tower project will involve the development of a series of agreements with local landowners to provide permanent easements onto properties for the placement of the tower and necessary transmission infrastructure. In return, landowners generally receive a stream of income, similar to a land leasing structure. Currently, there is one wind energy project operating in Lewis County, with additional projects proposed for the future.

The Maple Ridge Wind Power Project consists of 195 wind turbines and three permanent meteorology towers on the Tug Hill Plateau just west of the Village of Lowville. In 2005, a total of 120 Vestas wind turbines were constructed within the Phase I project area; the remaining 75 turbines in Phase IA and II of the project were constructed in May to December 2006. Each 1.65 MW turbine consists of a 262-foot tall tubular steel tower, a maximum 269-foot diameter rotor, and a nacelle which houses the generator, transformer, and power train. When the rotor blades are in the 12 o'clock position the tower stands 390 feet above the ground.

The Maple Ridge Wind Farm has the capacity to produce 321 MW of power in a one-hour period. According to William Moore of PPM-Atlantic Renewable, a typical 1.65 MW wind turbine tower in New York State will produce approx 4,400 MWh of energy per year. When extrapolated to the Maple Ridge Wind Farm, this equates to approximately 3.7 billion MWh of energy generation capability in a year's time, and up to 2 percent of the state's residential power needs. All of the electricity is sold to the New York Independent System Operator (ISO), which operates the State's bulk electric grid.

Due to the tremendous potential for wind energy on the Tug Hill Plateau, an additional project is proposed for the southwest corner of the Town of Martinsburg. As of July 2008, the 40-tower Roaring Brook Wind Power Project is still in the agreement and approval stages.

Other Alternative Energy Projects

The wood energy sector has seen a renewed resurgence as fossil fuel prices have skyrocketed. As of 2005, the state had two stand-alone wood energy plants, one of which is the Lyonsdale Biomass facility in Lewis County. In addition, the NYSDEC and the Adirondack Energy Smart Park Initiative (E\$PI) are administering a grant program for municipal and institutional facilities interested in exploring the feasibility of utilizing locally sourced wood to reduce annual heating costs. This program further supports the forestry industry in Lewis County by providing the opportunity for an additional market place for timber products.

Wood fiber and bark burned for energy are referred to as biomass fuel and come from three sources: tree tops and low quality stems of harvested trees (whole tree chips) which come from forestry harvests, land clearing or development and, sawmill/secondary wood manufacturing residue. Other minor sources of wood for energy may also come from storm damaged trees/urban wood waste and used pallets, railroad ties and other used manufactured wood.

The Lyonsdale Biomass wood-fired cogeneration facility is located in the Town of Lyonsdale. The 19 MW facility utilizes a boiler, steam turbine, and generator to produce electricity for delivery to the New York ISO and 17,000 pounds per hour average steam flow to nearby Burrows Paper Corporation. The facility consumes an average of 700 tons of wood chips, sawmill residues and other wood waste (feedstock) per day for fuel, producing five tons of wood ash per day as a by-product. This wood ash, through a process developed by the Lyonsdale facility in conjunction with Cornell University, is tested and distributed to local farmers for use as a soil amendment and a liming substitute. The Lyonsdale Biomass facility is an excellent example of resources being utilized efficiently and sustainably, while providing enhanced economic benefits. The parent

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Reserve for Map 11.



company, Catalyst Renewables, is currently partnering with SUNY ESF to improve the process of creating cellulosic ethanol from wood chips, an energy generator that could utilize the county's vast renewable timber resources.

A commercial demonstration bio-refinery will be built adjacent to the Lyonsdale Biomass cogeneration facility once the research is complete. Based on research from SUNY-ESF, the plant, to be constructed in 2009 to 2010, will consume 25 dry-tons per day of feedstock, and produce 130,000 gallons per year of ethanol and 6,000 tons per year of acetic acid. The feedstock will then be burned at the adjacent biomass facility for power generation. The goal is to grow most of the feedstock regionally using short rotation woody crops such as willows.

In addition to the wood-energy industry taking advantage of Lewis County's abundant forest resources, the opportunity exists to leverage the county's vast agricultural and dairy industry to aid in the production of energy. Kraft Foods' cream cheese manufacturing facilities in Lowville apply anaerobic treatments to the cheese by-product, whey, to power the plant's steam boilers. The methane produced will help replace more than a third of the facilities' natural gas needs. Additionally, Lewis County, the Village of Lowville, and Cornell Cooperative Extension are currently exploring a community digester concept whereby animal waste from local farms and food waste from restaurants, schools, and the hospital can be converted into energy at a centralized facility.

Transportation (see Map 11)

Roadways

Throughout the year, the primary mode of transportation in Lewis County is the automobile. The county's roadway network consists of state highways and county roads concentrated in the Black River Valley primarily connecting points north and south. Topography limits opportunities for east-west travel outside of the valley. Exceptions to these limitations include County Road 46 which links State Route 26 in Lewis with Osceola. As well, State Route 177 and County Road 26 link Jefferson County with the Adirondack Park in Watson and the two routes converge in the Lowville area. In the north, State Route 126 links Carthage with Croghan, and State Route 3 cuts across Diana connecting Harrisville with points west and south.

The interstate highway system does not enter Lewis County. I-81 is the closest route, connecting the Thousand Islands to Syracuse and skirting Lewis County's western border. The lack of convenient access to the interstate highway system is often cited as a barrier to economic growth. However, I-81 south to the NYS Thruway is a primary connection to points east and west for goods being shipped out of Lewis County. Responsibility for roadways is shared amongst three groups: the New York State Department of Transportation (NYSDOT) - 360 lanes miles of

roadway; Lewis County - 496 lane miles; and towns and villages approximately 1,800 lane miles. The county highway system ranges from two lane gravel roads to four lane arterials. Based on discussions with engineers from NYSDOT and the Lewis County Highway Superintendent, the majority of roads on the NYSDOT and county system are rated to be in good condition with a small percentage as fair or poor. The state and county's primary concern for the road network is the provision of available resources for proper maintenance and repair.

Emphasis is being placed on the reconstruction and reinvestment of existing roadways; there are no solid plans to construct new roads in the foreseeable future. However, DANC is currently studying potential improvements to Route 12 between Lowville and Watertown. In addition, the county, towns and NYSDOT have shared services agreements for snow plowing, fueling, heavy equipment sharing and maintenance of roads. These agreements help offset the burden of infrastructure maintenance and upkeep, and create efficiencies and economies of scale not readily available to a sparsely populated area such as Lewis County. There are three functional categories of roads in Lewis County, including:

Arterials — roadways designed to accommodate both through traffic and access to residential and commercial uses. State Routes 3, 12, 12D, 26, 126, 177, 410, and 812 are major arterial routes through the county.

Major Access — roadways that generally accommodate traffic from residential and commercial areas and direct it to arterials. They are most commonly county roads, including CR 39, CR 51, CR 14 and CR 43.

Local Streets — consist of all other streets at the local municipal level, primarily serving residential and local commercial areas.

Mass Transit

There is no public transportation system in Lewis County. The only mass-transit service to the county is provided by the Birnie Bus Service, with stops at Lowville and Port Leyden providing service to the City of Utica during weekdays. There is one private taxi service located in Lewis County, although numerous private liveries provide service to the more remote regions of Lewis County and the North Country. Additionally, a variety of county and regional human service programs provide on-demand transportation services to residents in need. The county has completed a transportation study outlining the provision of efficient and effective transit services to more of its citizens.

Railroads

Rail service within Lewis County is freight only. Amtrak's Empire Line services Rome, Utica and Syracuse, 41 miles, 49 miles and 60 miles away, respectively. The Empire Line connects to Niagara Falls to the west and New York City to the southeast. Lewis County's freight service links

Lyons Falls south to Utica via the MHWa short line and CSX. In 2001, Lyons Falls Pulp and Paper, the main purveyor of the rail line in Lyons Falls, closed which lessened the usage of the Utica line. Currently this infrastructure is underutilized and has the capacity for expanded usage in the future.

Genesee Valley Transportation (GVT), the owner of the rail lines from Lowville to Croghan and from Lowville to Carthage is no longer providing rail service and is proposing to abandon those lines. The Black River-St. Lawrence Resource Conservation and Development District (RC & D) is seeking to purchase the line from Lowville to Carthage, while GVT has agreed to donate the line from Lowville to Croghan to RC & D. Lewis County is proposing to convert these rail beds to multi-modal trails, which would connect with the existing county trail system. The Railway Historical Society of Northern New York intends to use the portion of the line from Beaver Falls to Croghan for tourist excursions. Finally, another freight line connects Carthage with Harrisville and points east to Newton Falls in St. Lawrence County, with connections to the CSX network from Carthage. This line is proposed to be rehabilitated and reopened to serve Newton Falls Fine Papers and Benson Mines. Other companies in Harrisville may benefit from the revived service.

Bike and Pedestrian Network

There is one official bike route within Lewis County that is utilized for recreation and transportation between Harrisville and Boonville, traveling along the Route 12/812/3 scenic byway. Most state and county highways are occasionally used by bikers, with varying shoulder widths and conditions limiting this option. Hiking and walking trails within parks and conservation areas are discussed within the Recreation section on page 41. Pedestrians in nearly all county villages are served by a limited sidewalk network.

Air and Waterfront Infrastructure

There are no public air or water ports in Lewis County. The closest commercial air service is located in Watertown, 30 miles to the west, and Syracuse, 90 miles to the southwest. Two small private airfields are located in the Town of Pinckney and the Town of New Bremen (currently inactive). The St. Lawrence Seaway system provides the closest available water transportation to Lewis County at the port of Ogdensburg in St. Lawrence County; a study is currently underway to determine the flows of goods to/from this location and the surrounding counties. The Port of Ogdensburg and the Port of Oswego in Oswego County are approximately 90 miles from Lowville and are linked to the county via Interstate and State Highway systems. The Black River is navigable between Carthage and downstream of Lyons Falls.