Agricultural Soils Map
Town and Village of Ludlow
Municipal Development Plan
Adopted by Town: 10/7/2019
Adopted by Village: 10/8/2019

Town of Ludlow

Village of Ludlow

Village of Ludlow

Town of Ludlow

- Prime Agricultural Soils
- Agricultural Soils of Statewide Importance
- River/ Stream
- Lakes/ Ponds
- State Highway
- Class 1 Town Highway
- Class 2 and 3 Town Highway
- Class 4 Town Highway
- Forest Road, Legal Trail, or Private Road
- Railroad
- Town and Village Boundary

Data Sources: Agricultural Soils (NRCS 2011), Railroad (VTrans 2014), Waterbodies (VHD 2008), Roads (VTrans 2016), Town and Village Boundary (CA 2014).

VT State Plane. Meters, NAD 83

Map drawn January 3, 2018

SWCRPC
SOUTHERN WINDSOR COUNTY REGIONAL PLANNING COMMISSION
P.O. Box 320, Ascutney, VT 05030
802-674-9201 www.swcrpc.org

N

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Water Features Map
Town and Village of Ludlow
Municipal Development Plan
Adopted by Town: 10/7/2019
Adopted by Village: 10/8/2019

Watersheds

- Dam
- Wetland
- River Corridor
- Surface Water Protection Area
- Groundwater Protection Area
- Floodway (Zone AE)
- Floodplain (Zone A)
- Floodplain (Zone AE)
- River/ Stream
- Lakes/ Ponds
- State Highway
- Class 1 Town Highway
- Class 2 and 3 Town Highway
- Class 4 Town Highway
- Forest Road, Legal Trail, or Private Road
- Railroad
- Town and Village Boundary

Watersheds (small map only)

- Middle Branch Williams River
- North Branch Williams River
- Black River
- West River

Special Flood Hazard Areas (SFHA), including the Floodway and Floodway Fringe (i.e. Floodplain), are shown on this map for planning purposes only. This is not the official map for regulatory flood hazards.

Data Sources: Dams (ANR 2008), Floodplain and Floodway (Special Flood Hazard Areas) (FEMA 2008), River Corridor (ANR January 2, 2015), Wetlands (VT Significant Wetlands Inventory) (ANR 2010), Groundwater Protection Areas (ANR 2011), Surface Water Protection Areas (ANR 2010 Railroad (VTrans 2014), Waterbodies and watersheds (VHD 2008), Roads (VTrans 2016), Town and Village Boundary (CA 2014).

VT State Plane. Meters, NAD 83

Map drawn January 3, 2018

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Town of Ludlow

Village of Ludlow

N

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This map shows existing electric utility service areas and other electric utility resources.

For up to date mapping of three phase electric distribution see www.greenmountainpower.com/innovative/solar_capital/3-phase-service-in-vermont/

For information about the distribution circuit rating for new distributed generation (DG) interconnections see the GMP Online Solar Planning Map http://arcg.is/2b1a2MU
All connections are currently good.

Utility Service Areas Map
Town and Village of Ludlow Municipal Development Plan
Adopted by Town: 10/7/2019
Adopted by Village: 10/8/2019

- Substation
- Electric Transmission Line
- Three Phase Electricity Distribution Lines
- Green Mountain Power
- Ludlow Electric Light Department (Municipal)
- River/ Stream
- Lakes/ Ponds
- State Highway
- Class 1 Town Highway
- Class 2 and 3 Town Highway
- Class 4 Town Highway
- Forest Road, Legal Trail, or Private Road
- Railroad
- Town and Village Boundary

Data sources: Electric Utility Service Areas (VCGI 2015), Substations (BCRC 2015 and SWCRPC 2017), Three Phase Electricity Lines (BCRC 2015 and Town/ RPC 2017), Transmission Lines (RPC 2016), Waterbodies (VHD 2008), Roads (VTrans 2016), Town and Village Boundary (CA 2014).

VT State Plane. Meters, NAD 83

Map drawn January 3, 2018

SWCRPC
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P.O. Box 320, Ascutney, VT 05030
802-674-9201 www.swcrpc.org

Town of Ludlow

Village of Ludlow

N

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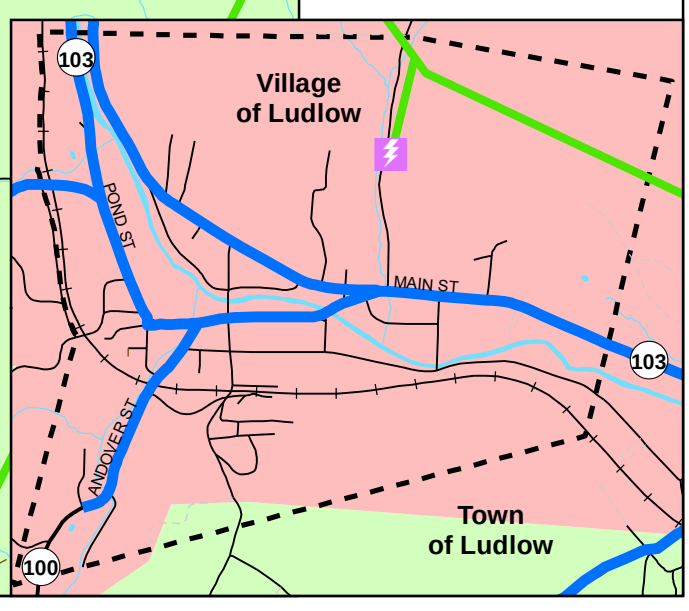

Wind Resources Map
Town and Village of Ludlow
Municipal Development Plan
Adopted by Town: 10/7/2019
Adopted by Village: 10/8/2019

This map shows the existing wind energy general sites and the potential for wind energy production considering
- Statewide analysis of solar potential
- Statewide, Regional and Local constraints which prevent or may impact development of solar energy generation facilities

Known constraints include areas that should not be developed with renewable energy generation facilities. Possible constraints include areas that may impact the siting of renewable energy generation facilities, but do not necessarily prevent their development. In addition to constraints listed in the November 2016 Regional Energy Planning Standards, SWCRPC has included no regional constraints and the Town and Village have included the following constraints:
- Known - State-designated Village Center and Zoning Preservation District
- Possible - Zoning Ridgeline Protection Overlay District

The Regional Energy Planning Standards are available at http://publicservice.vermont.gov/content/act-174-recommendations-and-determination-standards

Potential wind speeds were calculated using the TrueWind Solutions MesoMap wind mapping system. For more info see www.vtenergyatlas-info.com/wind/methodology

There are currently no commercial wind facilities in the area.

Prime Wind Potential
Areas identified with high wind potential and no known or possible constraints. Darker areas have higher wind speed.

Secondary Wind Potential
Areas identified with high wind potential and no known constraints. May have one or more possible constraints. Darker areas have higher wind speeds

- Commercial Wind Facility
- Residential Wind Facility
- Substation
- Electric Transmission Line
- Three Phase Electricity Distribution Lines
- River/ Stream
- Lakes/ Ponds
- Scenic Route 100 Byway
- State Highway
- Class 1 Town Highway
- Class 2 and 3 Town Highway
- Class 4 Town Highway
- Forest Road, Legal Trail, or Private Road
- Railroad
- Town and Village Boundary

Data sources: Ridgeline Overlay from Zoning (Effective 12/28/15), Wind Facilities (VT Energy Dashboard. Sites listed on Atlas on 02/03/2017), Prime and Secondary Wind Potential (VCGI 2017 and SWCRPC 2017), Substations (BCRC 2015 and SWCRPC 2017), Three Phase Electricity Lines (BCRC 2015 and Town/ RPC 2017), Transmission Lines (RPC 2016), Waterbodies (VHD 2008), Roads (VTrans 2016), Town and Village Boundary (CA 2014), Scenic Route 100 Byway (VTrans 2016).

VT State Plane. Meters, NAD 83

Map drawn January 3, 2018

SWCRPC
SOUTHERN WINDSOR COUNTY REGIONAL PLANNING COMMISSION
P.O. Box 320, Ascutney, VT 05030
802-674-9201 www.swcrpc.org

Village of Ludlow

Town of Ludlow

N

0 0.5 1 Miles

Solar Resources Map
Town and Village of Ludlow
Muncipal Development Plan
Adopted by Town: 10/7/2019
Adopted by Village: 10/8/2019

This map shows the existing solar energy production according to capacity for electricity generation and organization type. This map also shows the potential for ground-mounted solar energy production considering
- Statewide analysis of solar potential
- Statewide, Regional and Local constraints which prevent or may impact development of solar energy generation facilities

Known constraints include areas that should not be developed with renewable energy generation facilities. Possible constraints include areas that may impact the siting of renewable energy generation facilities, but do not necessarily prevent their development. In addition to constraints listed in the November 2016 Regional Energy Planning Standards, SWCRPC has included no regional constraints and the Town and Village have included the following constraints:
- Known - State-designated Village Center and Zoning Preservation District
- Possible - Zoning Ridgeline Protection Overlay District

The Regional Energy Planning Standards are available at http://publicservice.vermont.gov/content/act-174-recommendations-and-determination-standards

The VT Public Service Board divides applications for a Certificate of Public Good by net metering system capacity:
- 15kW or less
- Over 15kW but less than 150kW
- 150kW or more

Solar potential for ground-mounted systems was calculated to consider the following conditions:
- slope direction
- slope steepness
- radiation values from ESRI solar analyst

For more info see http://vcgi.vermont.gov/opendata/act174

Existing solar energy generation sites

- Business, Institution or Municipality with a capacity of 150kW or more
- Business, Institution or Municipality with a capacity of 15kW or less
- Business, Institution or Municipality with a capacity of 15.1kW - 150KW
- Residential, Capacity of 150kW or more
- Residential, Capacity of 15kW or less
- Residential, Capacity of over 15kW but less than 150kW
- Prime solar resource
- Secondary solar resource
- Substation
- Electric Transmission Line
- Three Phase Electricity Distribution Lines
- River/ Stream
- Lakes/ Ponds
- Scenic Route 100 Byway
- State Highway
- Class 1 Town Highway
- Class 2 and 3 Town Highway
- Class 4 Town Highway
- Forest Road, Legal Trail, or Private Road
- Railroad
- Town and Village Boundary

Data sources: Ridgeline Overlay from Zoning (Effective 12/28/15), Solar Facilities (VT Energy Dashboard. Sites listed on Atlas on 02/03/2017), Prime and Secondary Solar Potential (VCGI 2017 and SWCRPC 2017, Substations (BCRC 2015 and SWCRPC 2017), Three Phase Electricity Lines (BCRC 2015 and Town/ RPC 2017), Transmission Lines (SWCRPC 2016), Waterbodies (VHD 2008), Roads (VTrans 2016), Town and Village Boundary (CA 2014), Scenic Route 100 Byway (VTrans 2016).

VT State Plane. Meters, NAD 83

Map drawn January 3, 2018

SWCRPC
SOUTHERN WINDSOR COUNTY REGIONAL PLANNING COMMISSION
P.O. Box 320, Ascutney, VT 05030
802-674-9201 www.swcrpc.org

N
0 0.5 1 Miles

Village of Ludlow
Town of Ludlow

Hydro Resources Map
Town and Village of Ludlow
Municipal Development Plan
Adopted by Town: 10/7/2019
Adopted by Village: 10/8/2019

This map shows the potential for hydro energy production considering
- Statewide analysis of solar potential
- Statewide, Regional and Local constraints which prevent or may impact development of solar energy generation facilities

Potential hydro electric generation sites were identified by using existing dam location data for all of Vermont and then estimating electric production. Estimating is an inexact science, and estimates can vary widely between different studies. For more info see www.vtenergyatlas-info.com/hydro/methodology

The Regional Energy Planning Standards are available at http://publicservice.vermont.gov/content/act-174-recommendations-and-determination-standards

Existing Hydro Sites

Potential Hydro Sites

Undeveloped hydro potential over 50 KW

Undeveloped hydro potential less than 50KW

Potential with penstock

Substation

Electric Transmission Line

Three Phase Electricity Distribution Lines

River/ Stream

Lakes/ Ponds

State Highway

Class 1 Town Highway

Class 2 and 3 Town Highway

Class 4 Town Highway

Forest Road, Legal Trail, or Private Road

Railroad

Town and Village Boundary

Data sources: Existing and Potential Hydro Sites (VSJF 2010), Substations (BCRC 2015 and SWCRPC 2017), Three Phase Electricity Lines (BCRC 2015 and Town/ RPC 2017), Transmission Lines (RPC 2016), Waterbodies (VHD 2008), Roads (VTrans 2018), Town and Village Boundary (CA 2014).

VT State Plane. Meters, NAD 83

Map drawn December 18, 2018

SWCRPC
SOUTHERN WINDSOR COUNTY REGIONAL PLANNING COMMISSION
P.O. Box 320, Ascutney, VT 05030
802-674-9201 www.swcrpc.org

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0 0.5 1 Miles

Village of Ludlow

Town of Ludlow

APPENDIX C: Ludlow Governmental Structure

Town of Ludlow
Select Board – Appoints Municipal Manager, Planning Commission members and Development Review Board members
Municipal Manager – Manages all Town Departments and staff

Select Board also appoints committee members such as Regional Planning Commission, Solid Waste Management District, Health Officer, Recreation Committee, Transportation Advisory Committee, Connecticut River Transit, Fence Viewers, Forest Fire Warden, Pound Keeper, Surveyor of Wood & Lumber, Tree Warden, Weigher of Coal.

Village of Ludlow
Village Board of Trustees – Municipal Manager
Municipal Manager – Manages all Village Departments and staff

Water Commission
Water Commission – Municipal Manager
Municipal Manager – Manages Water Department and staff

Elected Officials
Select Board, Village Trustees, Water Commission, Town Clerk/Treasurer, Constable, Cemetery Commission, Trustees of Public Funds, Boards of Listers, Village Clerk

Appendix D: Municipal Facilities Inventory

Reference Number	Description	E911 Address	Jurisdiction (Village/Town)	Department	Building Value	Contents Value	Valuation Type*	Employees per building	Vehicles Garaged in Building	Comments/ Recommendations
1	Vacant Single Family Home; Gift to Town for benefit of Fire Department	8 Terrace Avenue	Town	Fire	$82,033.00		ACV	0	0	
2	Restroom/ Warehouse/ Bath House	239 West Hill Road	Town	Parks & Recreation	$148,997.00	$2,500.00	GRC	0	0	
3	Dorsey Park Recreation Building	Pond & Andover Streets	Town	Parks & Recreation	$84,720.00	$10,200.00	GRC	0	0	
4	Little League Park/Playground	Pleasant St. Extension	Town	Parks & Recreation	$10,199.00	$0.00	AV	0	0	
5	Town Garage	19 West Hill Road	Town	Highway Department/DPW	$859,950.00	$60,000.00	GRC	5	0	
6	Town Hall	37 Depot Street	Town	General	$4,055,259.00	$50,000.00	GRC	11	0	
7	Transfer Station	710 VT Route 100 South	Town	Solid Waste - Transfer Station	$40,637.00	$5,000.00	GRC	2	0	
8	Black River Senior Center	10 High Street	Town	General	$850,211.00	$0.00	GRC	6	0	
9	Black River Academy Museum	14 High Street	Town	General	$1,915,152.00	$42,000.00	GRC	2	0	
10	Salt Shed #2	19 West Hill Road	Town	Highway Department/DPW	$37,993.00	$0.00	GRC	0	0	
11	Armory Building #3 - Cold Storage	37 Main Street	Town	General	$37,336.00	$10,000.00	ACV	0	1	
12	Transfer Station Swap Shop	710 VT Route 100 South	Town	Solid Waste - Transfer Station	$18,200.00	$0.00	GRC	0	0	
13	Backstops, Little League Park	Little League Park	Town	Parks & Recreation	$5,920.00	$0.00	AV	0	0	
14	Tool house, Pleasant View Cemetery	Pleasant View Cemetery	Town	Cemetery	$11,723.00	$1,000.00	GRC	0	0	
15	Salt Shed #1	19 West Hill Road	Town	Highway Department/DPW	$20,974.00	$0.00	GRC	0	0	
16	Scale House With Office Addition	336 VT Route 100 North	Town	Solid Waste - Transfer Station	$33,888.00	$1,000.00	GRC	3	0	
17	Concession Stand, Little League Park	Little League Park	Town	Parks & Recreation	$14,424.00	$1,000.00	GRC	0	0	
18	Chain Link Fence (1,320'), Little League Park	Little League Park	Town	Parks & Recreation	$11,943.00	$0.00	AV	0	0	
19	Warehouse	West Hill Road	Town	Highway Department/DPW	$43,692.00	$30,000.00	GRC	3	0	
20	Bandstand, Veteran's Memorial Park	Main Street	Town	Parks & Recreation	$15,783.00	$0.00	AV	0	0	
21	Ludlow Community Center (previously Armory Building #1)	37 Main Street	Town	General	$1,818,606.00	$25,000.00	GRC	8	0	
22	Commercial Tenant (Previously Armory Building #2)	37 Main Street	Town	General	$847,898.00		GRC	8	1	
23	Scoreboard/Batting Cage/Pitching Machine, Little League Park	Little League Park	Town	Parks & Recreation	$6,591.00	$0.00	AV	0	0	
24	Dugouts, Little League Park	Little League Park	Town	Parks & Recreation	$10,279.00	$0.00	AV	0	0	
25	Fire Station	59 Pond Street	Town	Fire	$676,636.00	$45,000.00	GRC	0	9	
26	Dorsey Park Field/Skate Park/Tennis Courts	Pond Street	Town	Parks & Recreation	$109,671.00	$0.00	AV	0	0	
27	Public Safety Building	19 West Hill Road	Town	Law Enforcement	$1,299,400.00	$100,000.00	GRC	10	6	

Reference Number	Description	E911 Address	Jurisdiction (Village/Town)	Department	Building Value	Contents Value	Valuation Type*	Employees per building	Vehicles Garaged in Building	Comments/ Recommendations
28	Vault, Pleasant View Cemetery	Pleasant View Cemetery	Town	Cemetery	$40,578.00	$14,000.00	GRC	0	0	
29	Maintenance & Office - lower building, Pleasant View Cemetery	Pleasant View Cemetery	Town	Cemetery	$24,237.00	$6,000.00	GRC	3	0	
30	Storage Building - upper building, Pleasant View Cemetery	Pleasant View Cemetery	Town	Cemetery	$60,284.00	$15,000.00	GRC	0	2	
31	Chlorine Building	Pleasant Street	Village	Sewer/ Wastewater	$21,159.00	$0.00	GRC	0	0	
32	Blower Building	Pleasant Street	Village	Sewer/ Wastewater	$16,128.00	$0.00	GRC	0	0	
33	Electrical Sub-Station	16 Megawatt Lane	Village	Electric/Light	$537,601.00	$0.00	GRC	0	0	Installed 1987, 14MVA
34	Electrical Sub-Station	30 Commonwealth Avenue	Village	Electric/Light	$537,601.00	$0.00	GRC	0	0	Installed 1999, 15 MVA
35	Electrical Sub-Station	220 Deroo Lane	Village	Electric/Light	$537,601.00	$0.00	GRC	0	0	Installed 2003. 14MVA
36	Garage/Storage	158 VT Route 100 North	Village	Electric/Light	$1,088,463.00	$100,000.00	GRC	5	14	
37	Wastewater Treatment Plant Garage	Pleasant Street Extension	Village	Sewer/ Wastewater	$258,335.00	$5,000.00	GRC	0	3	
38	Water Pump Station	Bridge Street	Village	Water	$151,177.00	$0.00	GRC	0	0	
39	Water Tank	0 Pallotta's Hill Road	Village	Water	$438,682.00	$0.00	GRC	0	0	
40	Sewer Plant	212 Pleasant Street Extension	Village	Sewer/ Wastewater	$2,980,090.00	$4,000.00	GRC	4	0	
41	Well Site Building	Pleasant Street Extension	Village	Water	$8,971.00	$0.00	GRC	0	0	
42	Water Storage	South Hill Road	Village	Water	$370,888.00	$0.00	GRC	0	0	
43	Water Booster Pump Station	Gill Terrace	Village	Water	$84,720.00	$0.00	GRC	0	0	
44	Customer Service Administration Building	9 Pond Street	Village	Electric/Light	$312,616.00	$75,000.00	GRC	3	0	
45	Utility Shed	Commonwealth Avenue	Village	Electric/Light	$26,692.00	$20,000.00	GRC	0	0	
46	Lower Vault (Altitude Valve)	Andover Street	Village	Water	$97,349.00	$0.00	GRC	0	0	
47	Upper Vault (Pressure Reducing Valve)	VT Route 100 South	Village	Water	$83,966.00	$0.00	GRC	0	0	
48	Water Treatment	Old Route 100	Village	Water	$301,935.00	$0.00	GRC	0	0	
49	Wastewater Treatment Facility Headworks & Screen	212 Pleasant Street Extension	Village	Sewer/ Wastewater	$564,803.00	$0.00	GRC	0	0	
				Totals:	$21,611,991.00	$621,700.00				

*RC: Replacement Value, GRC: Guaranteed Replacement Value, HRC: Historical Replacement Value, AV: Agreed Value, ACV: Actual Cash Value

Appendix D: Municipal Vehicles Inventory

Reference Number	Year	Make/Model	Vehicle Type	Jurisdiction (Village/Town)	Department	Garage Location	Comments/ Recommendations
1	2016	Ford F550 Horton Type 1 Ambulance	Ambulance	Town	Ambulance/Rescue	19 West Hill Street	
2	2007	Car-Mate Trailer CM824C-CT	Trailer	Town	Ambulance/Rescue	19 West Hill Street	
3	2013	Ford F450 Ambulance	Ambulance	Town	Ambulance/Rescue	19 West Hill Street	
4	2012	Chevrolet Sliverado 2500	Pickup Truck	Town	Buildings & Grounds	19 West Hill Street	
5	2009	Chevrolet 3500 1-Ton Dump	Pickup Truck	Town	Cemetery	43 High Street	
6	2018	John Deere Compact Utility Tractor/Loader/ Backhoe 3033R	Loader/Backhoe/ Excavator	Town	Cemetery	43 High Street	
7	2004	Ford F350	Pickup Truck	Town	Fire	59 Pond Street	
8	1935	Ford Fire Truck	All Other Road Vehicles	Town	Fire	59 Pond Street	
9	2010	International Fire Pumper Tanker Truck	Fire Pumper/Tanker	Town	Fire	59 Pond Street	
10	2014	KME QMAX Custom Pumper	Fire Pumper/Tanker	Town	Fire	59 Pond Street	
11		Kubota Utility Vehicle	All Other Mobile Equipment	Town	Fire	59 Pond Street	
12	1994	Simon LT1 102' Aerial Ladder	All Other Road Vehicles	Town	Fire	59 Pond Street	
13	2006	Pace Cargo Trailer	Trailer	Town	Fire	59 Pond Street	
14	2003	KME Custom Pumper	Fire Pumper/Tanker	Town	Fire	59 Pond Street	
15	2017	Freightliner M2 106	Dump Truck	Town	Highway/DPW	19 West Hill Street	
16	2009	Caterpillar 120 MA AWD Grader	Grader	Town	Highway/DPW	19 West Hill Street	
17	2015	John Deere 410 L Backhoe/Loader	Loader/Backhoe/ Excavator	Town	Highway/DPW	19 West Hill Street	
18	2007	International 7600	Dump Truck	Town	Highway/DPW	19 West Hill Street	
19	2012	Ford F550	Dump Truck	Town	Highway/DPW	19 West Hill Street	
20	2008	Caterpillar Challenger Tractor Roadside Mower	All Other Mobile Equipment	Town	Highway/DPW	19 West Hill Street	
21	2017	Chevrolet 3500	Pickup Truck	Town	Highway/DPW	18 West Hill Road	
22	2018	Cam 19 Trailer	Trailer	Town	Highway/DPW	19 West Hill Street	
23	2011	International 7600 Dump	Dump Truck	Town	Highway/DPW	19 West Hill Street	
24	2006	Komatsu Loader WA250-5L	Loader/Backhoe/ Excavator	Town	Highway/DPW	19 West Hill Street	

25	2014	International 7400	Dump Truck	Town	Highway/DPW	19 West Hill Street
26	2017	Volvo EC60E Mini Excavator	Loader/Backhoe/ Excavator	Town	Highway/DPW	19 West Hill Street
27	2017	Ford Explorer Interceptor	Police Cruiser	Town	Law Enforcement	19 West Hill Street
28	2014	Ford Explorer Interceptor	Police Cruiser	Town	Law Enforcement	19 West Hill Street
29	2016	Ford Interceptor	Police Cruiser	Town	Law Enforcement	18 West Hill Street
30	2000	John Deere 460 Tractor Loader Bucket	All Other Mobile Equipment	Town	Parks & Recreation	19 West Hill Street
31	2012	IC Integrated CE S 66 Passenger W/ Wheelchair	Bus Other	Town	Transit/Buses	19 West Hill Street
32	2014	Ford Collins Mid Bus 30 Pass W/Wheel Chair Lift	Bus 21-60 Passenger	Town	Transit/Buses	19 West Hill Street
33	2010	Freightliner Thomas C2 Bus With Wheel Chair	Bus 21-60 Passenger	Town	Transit/Buses	19 West Hill Street
34	2014	Thomas Chev 051 MS Minotour Bus	Bus 21-60 Passenger	Town	Transit/Buses	19 West Hill Street
35	2017	Thomas SAF T Liner 48 Passenger Bus	Bus 21-60 Passenger	Town	Transit/Buses	19 West Hill Street
36	2017	Ford F550 Bucket Truck	All Other Road Vehicles	Village	Electric/Light	158 VT Route 100 North
37	1999	Caterpillar Loader/Backhoe	Loader/Backhoe/ Excavator	Village	Electric/Light	158 VT Route 100 North
38	2009	Ford F150	Pickup Truck	Village	Electric/Light	158 VT Route 100 North
39	2002	Ford Ranger P/U	Pickup Truck	Village	Electric/Light	158 VT Route 100 North
40	1998	Cross Country Utility Trailer	Trailer	Village	Electric/Light	158 VT Route 100 North
41	2016	Ford F350	Dump Truck	Village	Electric/Light	157 VT Route 100 North
42	2016	Ford F150	Pickup Truck	Village	Electric/Light	158 VT Route 100 North
43	2003	International 4400	All Other Road Vehicles	Village	Electric/Light	158 VT Route 100 North
44	1988	Sauber Wire Trailer	Trailer	Village	Electric/Light	158 VT Route 100 North
45	2003	Sauber Wire Trailer 1519	Trailer	Village	Electric/Light	158 VT Route 100 North
46	2001	Freightliner FL70 Digger	All Other Road Vehicles	Village	Electric/Light	158 VT Route 100 North
47	2000	Morbark Chipper 2011-D	Trailer	Village	Electric/Light	158 VT Route 100 North

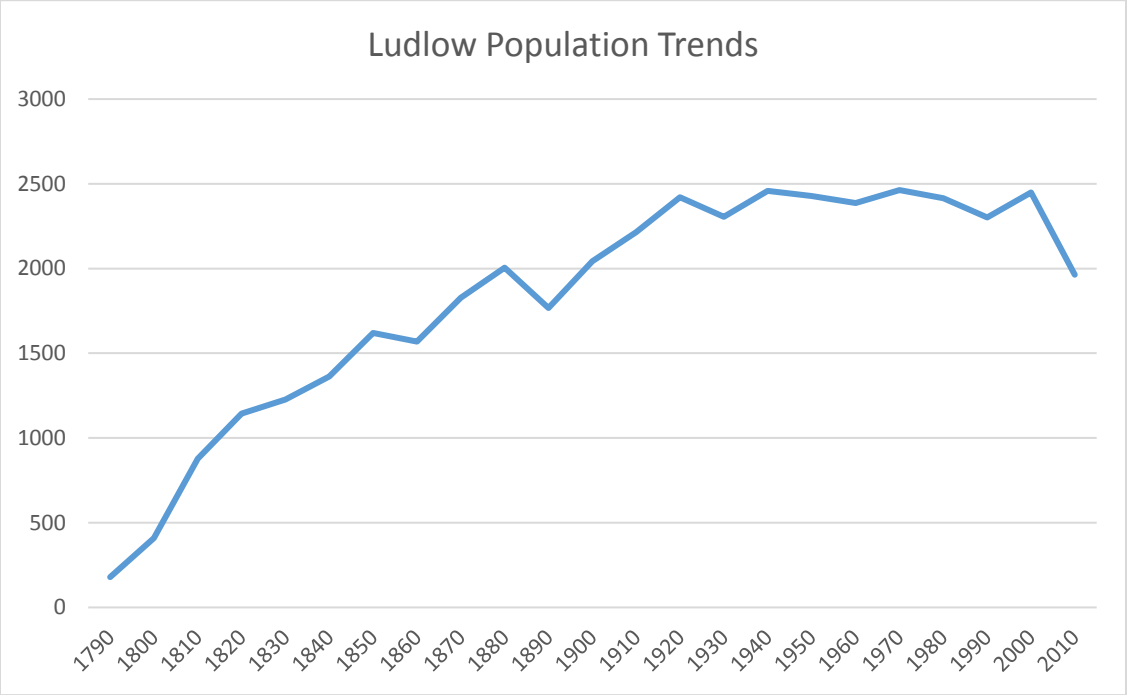
48	2003	Wells Cargo Utility Trailer	Trailer	Village	Electric/Light	158 VT Route 100 North
49	2003	Ford F150	Pickup Truck	Village	Electric/Light	158 VT Route 100 North
50	1985	Ingersoll Rand Air Compressor 100/47	Trailer	Village	Electric/Light	158 VT Route 100 North
51	2007	International 4400 Bucket	All Other Road Vehicles	Village	Electric/Light	158 VT Route 100 North
52	2018	Trackless MT7 Sidewalk Plow & Tractor with Attachments	All Other Mobile Equipment	Village	Highway/DPW	19 West Hill Street
53	1998	Johnson Street Sweeper 3000	All Other Road Vehicles	Village	Highway/DPW	158 VT Route 100 North
54	2018	Chevrolet	Pickup Truck	Village	Sewer/Wastewater	212 Pleasant Street Extension
55	1986	Sreco HM 5/16-TR Roder	Trailer	Village	Sewer/Wastewater	212 Pleasant Street Extension
56	2005	Goodwin Dri-Prime Pump	Trailer	Village	Sewer/Wastewater	212 Pleasant Street Extension
57	2015	Chevrolet 3500	Pickup Truck	Village	Sewer/Wastewater	212 Pleasant Street Extension
58	2008	Sullair Towable Air Compressor	Trailer	Village	Water	212 Pleasant Street Extension

Appendix D: Municipal Dam Inventory

Reference Number	Name	Jurisdiction (Village/Town)	Downstream Hazard Class	Height (ft.)	Normal Storage (acre-feet)	Comments/ Recommendations
1	Lake Rescue	Town	3	9	1,465	
2	Reservoir Pond	Town	3	7	80	
3	Jewell Brook Site No. 1	Town	1	58	17	
4	Jewell Brook Site No. 2	Town	1	70	5	
5	Jewell Brook Site No. 3	Town	1	65	116	
6	Jewell Brook Site No. 3 Dike	Town	3	17	116	
7	Jewell Brook Site No. 5	Town	1	113	10	

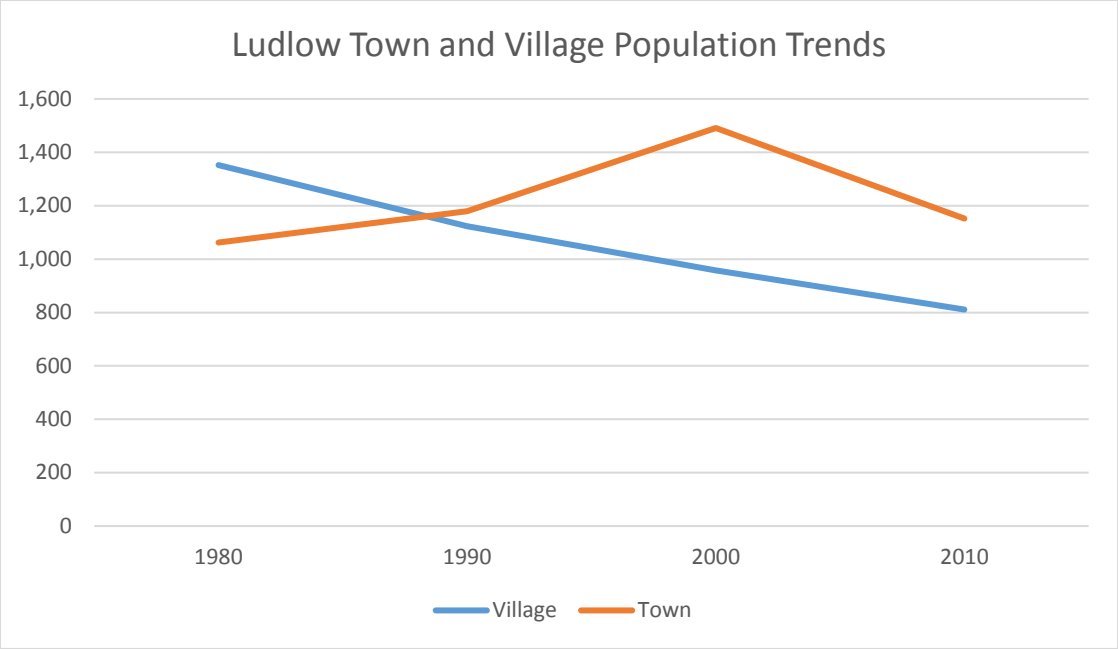
Appendix E – Community Data Profile

1. Population[1] [2]

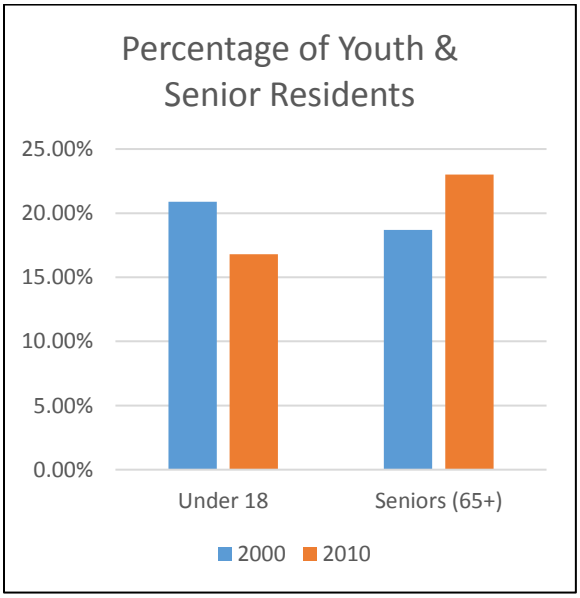


- The population in Ludlow declined between 2000 and 2010. However, it may not have been as steep of a decline since the methodology for population in ski towns changed for the 2010 Census.
- According to American Community Survey data, Ludlow's population in 2015 is estimated to be 2,140.

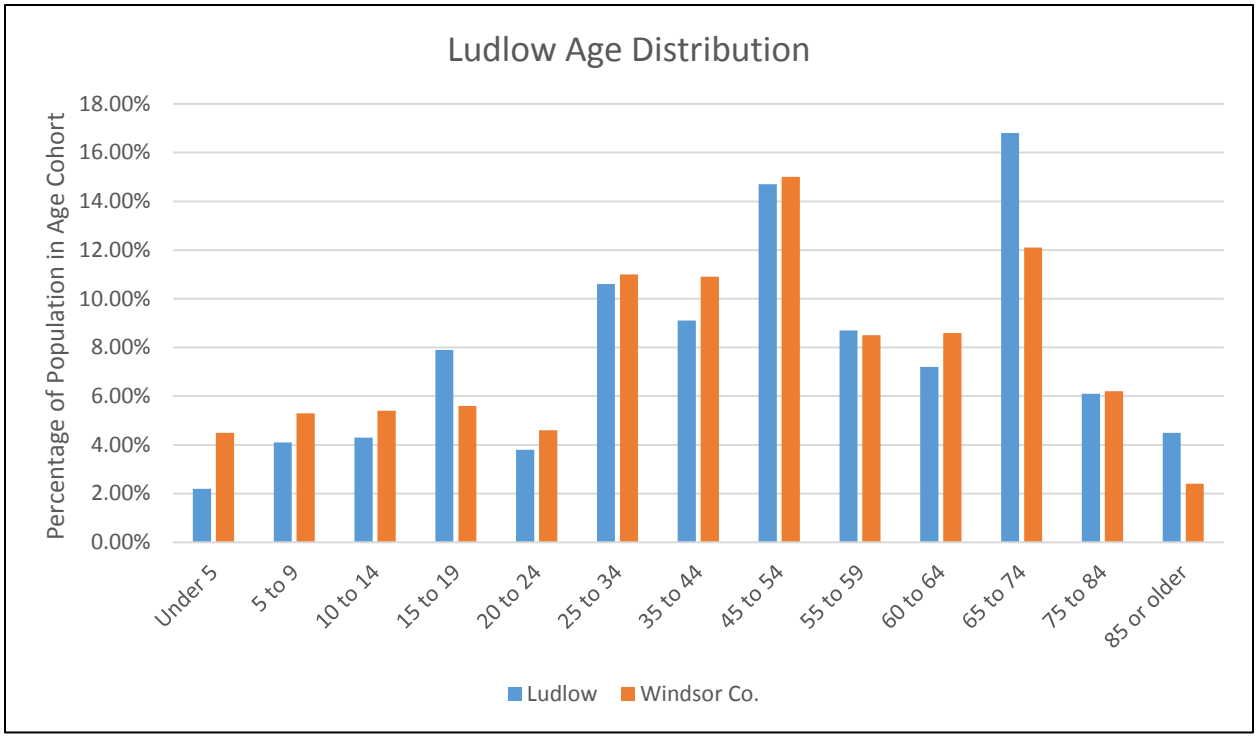
[1] 2010 Decennial Census, US Census Bureau
[2] American Community Survey (2011-2015), US Census Bureau



- Village of Ludlow population has declined ever since 1980.
- The population in the Town of Ludlow increased from 1980 to 2000, then declined between 2000 and 2010.



- Like much of Vermont, Ludlow's population is aging. As shown above, the proportionality of school-aged children has declined while persons over 65 years of age has increased from 2000 to 2010.



- Generally speaking, Ludlow has an older population than Windsor County, note the higher proportions of those aged 65 to 74 and 85 and older.

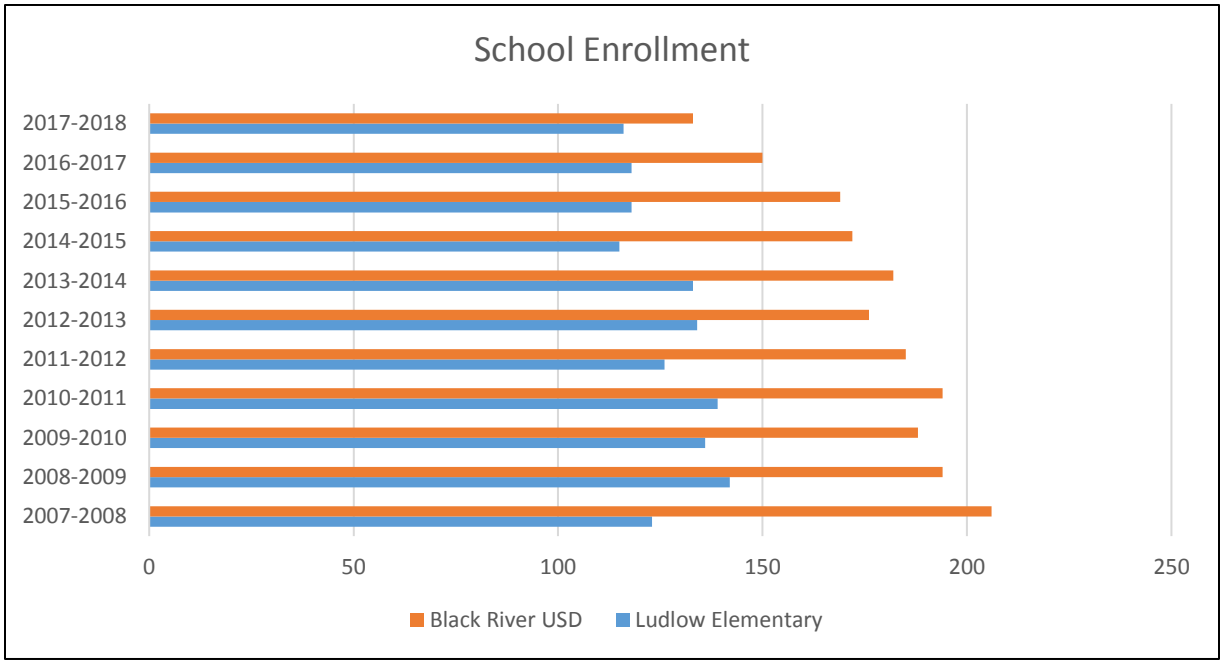
Population Projections[3]

	Scenario A	Scenario B
2010 Census Year	1,963	1,963
2020 Projection	1,855	1,750
2030 Projection	1,770	1,590

- An analysis conducted for the State of Vermont in 2013 estimates a decline in Ludlow's population over the twenty year period between 2010 and 2030.
- The analysis may have some limitations:
  - These population projections involved two scenarios. Scenario A is based on 1990 to 2000 trends. Scenario B is based on trends during the 2000s, which generally had lower growth rates than in the 1990s.
  - The decennial census methodology changed for the 2010 Census. This generally resulted in lower 2010 population numbers for ski towns in Vermont.
  - As discussed on page E-1, the population in 2015 was estimated to have increased to 2,140.

[3] *Vermont Population Projections – 2010 – 2030* (VT Agency of Commerce and Community Development, 2013)

2. School Enrollment[4]

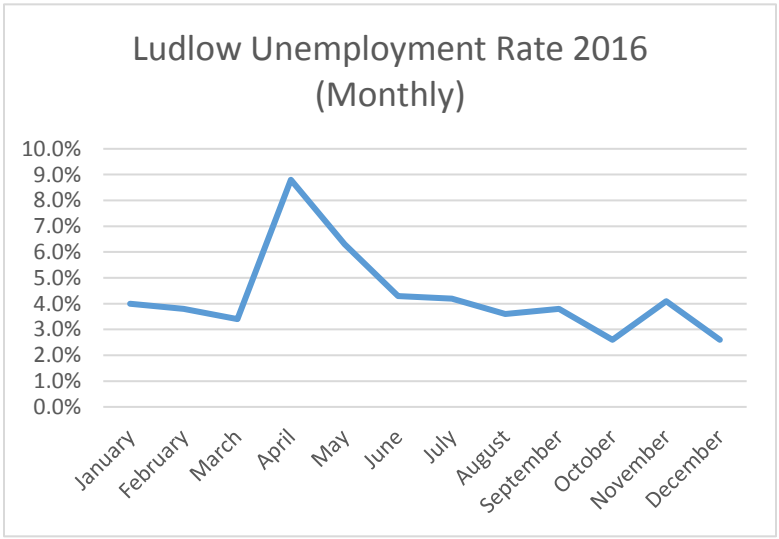


- Ludlow is experiencing declining school enrollment, notably in the Black River Union High School.
- By June 2020, the Black River Union High School will close. Families of students in grades 7 through 12 will have school choice after that.

3. Economic Data

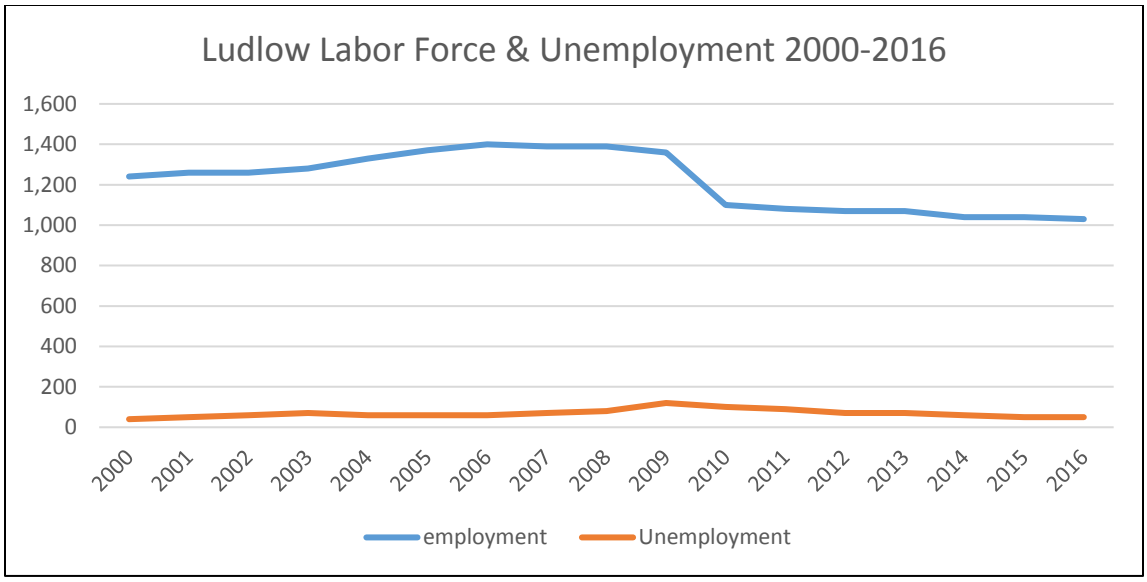
2016 Labor Force[5]

Total Civilian Labor Force:	1,073
Employment:	1,027
Unemployment:	46
Unemployment Rate:	4.3%



- Some jobs in Ludlow are affected by the "shoulder seasons". Unemployment generally peaks in the spring and fall. In April, unemployment was about 9%. November did not experience a significant spike in 2016.

[4] Vermont Department of Education (2018)
[5] Vermont Department of Labor, Economic & Labor Market Information (2018)



- The labor force declined noticeably around 2009 and 2010, which mirrors the national economic recession. Ludlow's labor force has been fairly steady since then.
- A corresponding spike in unemployment is observable in 2009-2010. The unemployment rate has returned to more "normal" levels since then.

Employment and Work Establishments in Ludlow[6]

NAICS code	Economic Sector	Establishments				Employment			
		1990	2000	2010	2016	1990	2000	2010	2016
11	Agriculture, forestry, fishing & hunting	1	1	1		*	*	*	
21	Mining	2	1	1	1	*	*	*	*
23	Construction	22	21	28	25	*	*	107	102
31-33	Manufacturing	5	6	4	5	141	144	*	*
42	Wholesale trade	5	7	6	5	23	*	*	*
44-45	Retail trade	31	29	25	26	203	190	160	*
51	Information	3	4	3	3	25	23	15	13
52	Finance & insurance	4	7	7	6	30	34	21	21
54	Professional & technical services	12	11	17	13	29	37	29	23
48-49	Transportation & Warehousing	2	2	1	1	10	11	7	9
61	Educational services	61	1	5	3	*	93	88	73
62	Health care & social assistance	6	7	6	6	*	*	*	*
71	Arts, entertainment & recreation	1	1			6	*		
72	Accommodation and food services	26	28	22	27	*	*	866	882
81	Other services, except public admin.	12	15	11	10	50	58	58	57
92	Public administration	1	4	3	2	87	75	89	60

- Common economic sectors in Ludlow include accommodation and food services, education/government, retail trade and construction.

[6] VT Labor Market Information, Vermont Department of Labor (2017)

Job Locations for Working Ludlow Residents (2015)[7]

	Count	Share
Ludlow village, VT	176	18.80%
Rutland city, VT	60	6.40%
Chester CDP, VT	23	2.50%
Springfield CDP, VT	18	1.90%
Cavendish CDP, VT	13	1.40%
Arlington CDP, VT	12	1.30%
Quechee CDP, VT	12	1.30%
Woodstock village, VT	12	1.30%
Wallingford CDP, VT	11	1.20%
Bellows Falls village, VT	10	1.10%
All Other Locations	587	62.80%

- Ludlow residents have a highly varied commuting patterns. Many travel long distances for work.
- About 20% work locally. The other work locations are significantly dispersed which makes travel by public transit a challenge.

Where Workers of Ludlow Jobs Live (2015)[7]

	Count	Share
Ludlow village, VT	182	9.30%
Springfield CDP, VT	93	4.80%
Rutland city, VT	60	3.10%
Claremont city, NH	55	2.80%
Proctorsville CDP, VT	38	2.00%
Wallingford CDP, VT	36	1.80%
Chester CDP, VT	25	1.30%
North Springfield CDP, VT	21	1.10%
Windsor CDP, VT	21	1.10%
Bellows Falls village, VT	15	0.80%
All Other Locations	1,402	72.00%

- A small percentage of employees at Ludlow businesses live locally; 90% live elsewhere, many of whom travel long distances.
- The Current provides seasonal commuter bus service, funded in part by Okemo Mountain Resort.
- The Bus (Marble Valley) operates a route connecting Ludlow and Rutland.

[7] 2015 Longitudinal Employer-Household Dynamics, US Census Bureau

4. Housing

Number of Households[8]

Year	Owning	Renting	Total
1960			748
1970	610	250	829
1980	618	310	928
1990	615	320	935
2000	759	301	1,060
2010	611	319	930

Total Housing Units[6]

Year	Total	Owner-Occupied	Renter-Occupied	Seasonal	Vacant-for sale	Vacant-for rent
1940	719					
1950	879					
1960	980					
1970	1,192	610	250			
1980	1,726	618	310	668	12	52
1990	2,677	615	320	1,647	22	39
2000	3,001	759	301	1,873	17	28
2010	3,285	611	319	2,195	39	79

- The number of households declined between 2000 and 2010.
- The number of seasonal and vacant units increased during that same time period.
- A lack of good or available rental units has been expressed as a problem for recruiting employees for certain local businesses.
- Anecdotally, some local apartments are now used primarily for short-term rentals and, therefore, are no longer available for long-term rentals.

Median household income (Census), 2009-2013[9]

Median household income (Census), 2009-2013	$39,850
... homeowner households	$60,347
... renter households	$22,083

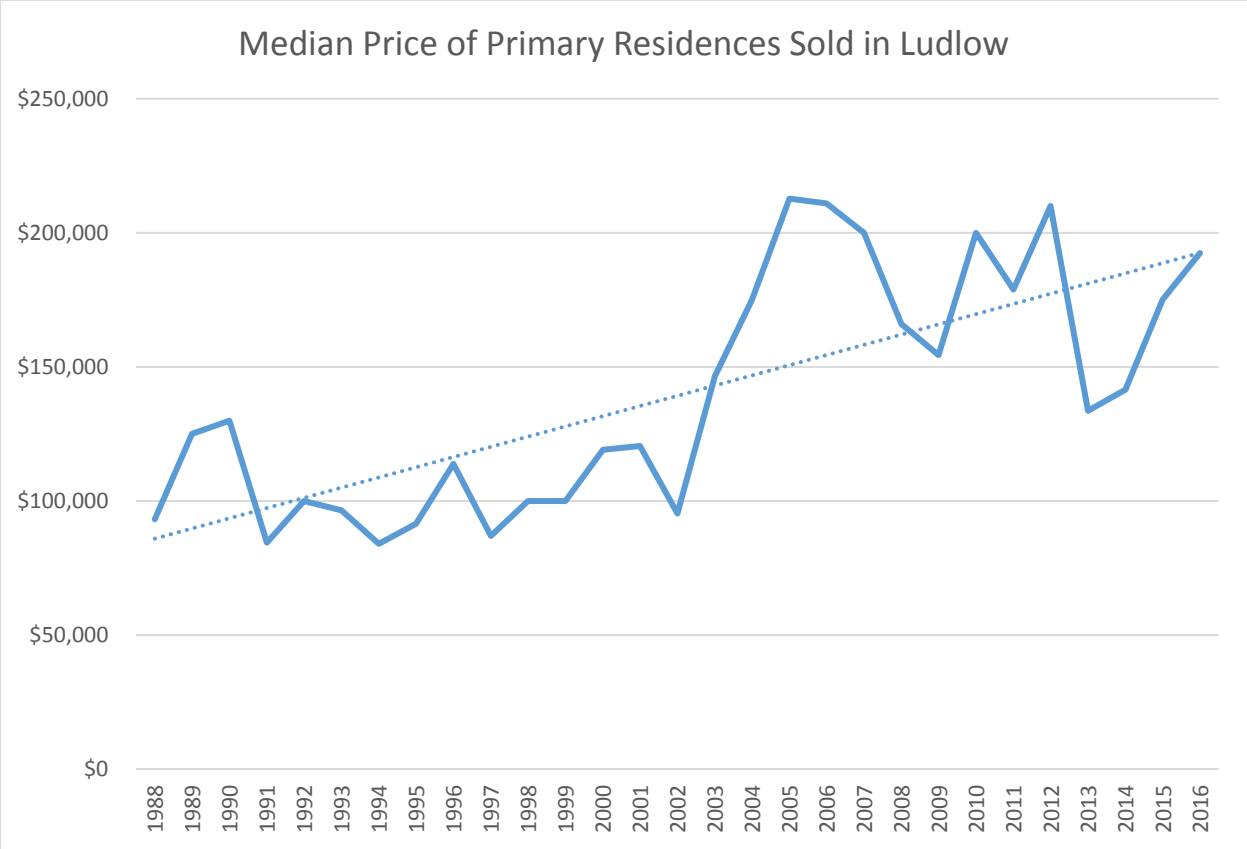
- Median household income for renters is significantly lower than for homeowners.

[8] 2010 Decennial Census, US Census Bureau
[9] 2009-2013 American Community Survey, US Census Bureau

Ability to Afford[9]

Owner-occupied housing units	**588**
... at or above 30% of household income	41%
... at or above 50% of household income	18.90%
Specified housing units with gross rent (total)	**350**
... at or above 30% of household income	38.90%
... at or above 50% of household income	24%

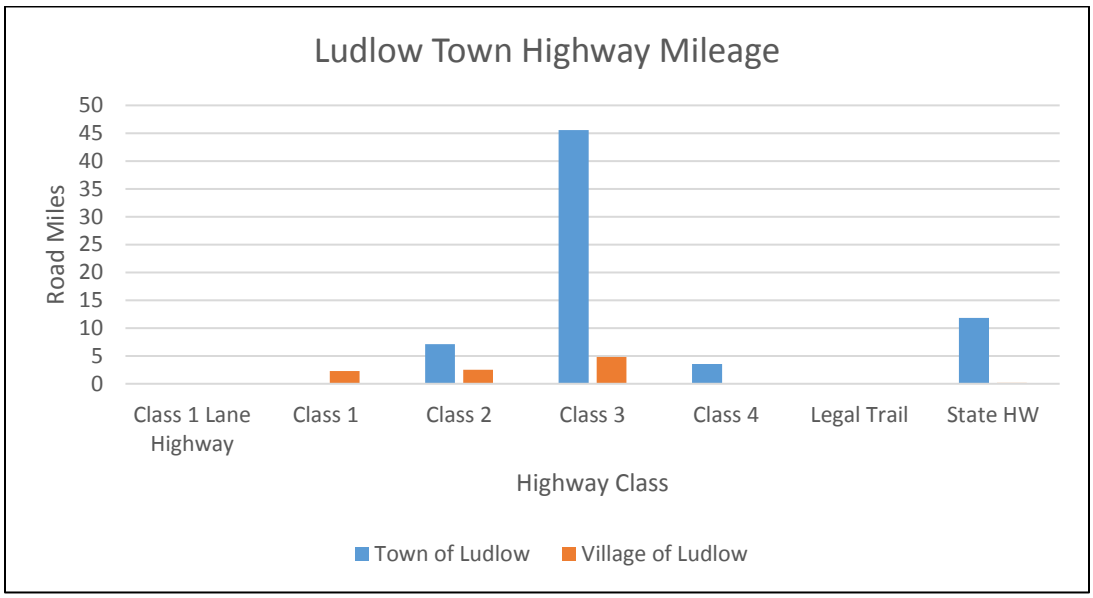
- Despite the discrepancy in median household incomes as discussed above, both homeowners and renters have similar problems in the ability to afford housing in Ludlow. About 2 out of every 5 households pay 30% or more of their income on housing, regardless of whether they own or rent.
- Nearly a quarter of all renter households pay at least half of their income on housing.



- In 2016, the median price of primary residences in Ludlow was $192,450. In 1988, it was $93,190.
- Home prices declined dramatically from 2006 to 2009, but have generally trended upwards in more recent years.

5. Transportation

Highway Mileage[10]



Insert traffic count and truck volume data

[10] VT Agency of Transportation, 2017

6. Land Use

Lands Enrolled in the Current Use Program

Total Acres	Forest	Non-Productive	Agriculture	Total Enrolled	% Total Acres
21,704	2,458.52	20.55	2,673.96	2,673.96	12.30

Current Land Use Summary[11] (2017 Grand List)

Category	Number	Acres	Avg. Acre per Unit	Total Property Value	Avg. Property Value per Unit
Commercial	178	4,652.15	26.14	$173,028,700	$972,071
Commercial Apartments	4	21.01	5.25	$15,293,100	$3,823,275
Industrial	3	939.78	313.26	$7,784,900	$2,594,967
Residential with Less than 6 Acres	1,479	1,753.49	1.19	$605,813,200	$409,610
Residential with 6 or More Acres	337	8,306.13	24.65	$152,047,400	$451,179
Mobile Home (Landed)	36	284.50	7.90	$3,829,600	$106,378
Mobile Home (Un-Landed)	84	0.00	0.00	$1,871,000	$22,274
Seasonal Home with Less than 6 Acres	15	11.68	0.78	$3,317,800	$221,187
Seasonal Home with 6 or More Acres	6	247.77	41.30	$791,900	$131,983
Utilities	3	0.00	0.00	$14,366,300	$4,788,767
Woodland	15	472.01	31.47	$701,900	$46,793
Miscellaneous	294	4,629.50	15.75	$31,199,300	$106,120
Other	1,072	0.00	0.00	$373,815,200	$348,708
TOTAL	**3,526**	**21,318.02**	**6.05**	**$1,383,860,300**	**$14,023,312**

- There appear to be a large number of condos included in the "Other" category in the 2017 Grand List.

[11] 2017 Ludlow Grand List (VT Department of Taxes)

7. Energy

Population

Total Population[i] (2015):	2,140
Proj. Annual Avg. Growth Rate[ii]:	↓ 0.01048
Population Density:	59.9 persons/ square mile

Households

Owner-Occupied Units[iii]:	611
Renter- Occupied Units[iii]:	319
Total Households[iii]:	3,285
Avg. Household Size[iii]:	2.06 people/ household

Businesses[iv]

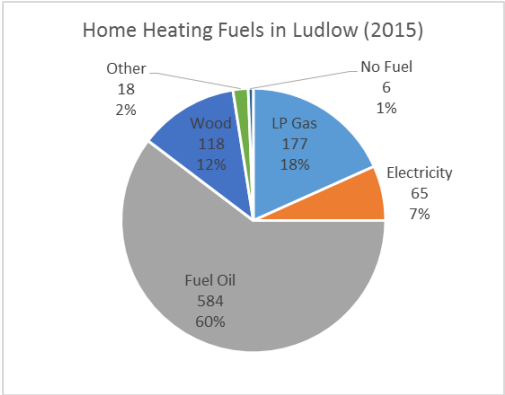
Total businesses in Ludlow:	144
Employees working in Ludlow:	1,925
Average wage:	$30,451

Heating

Residential[i] (see figure)

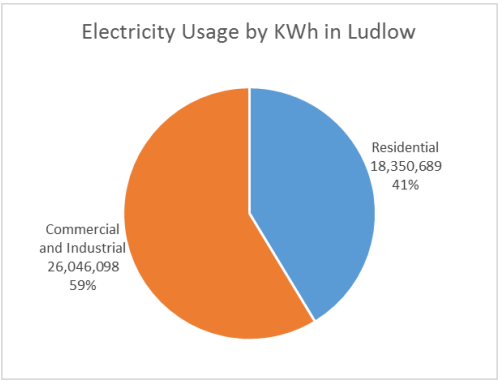
Businesses[v]:

Estimated avg. building space:	10,240 sq. ft.
Total energy use:	53.4 billion BTUs
Estimated total annual cost:	$1.3 million
Avg. annual cost per business:	$8,840



Transportation

Number of vehicles:	1,699
Estimated vehicle miles traveled:	35.5 million
Estimated gal. fuel used per year:	1.9 million
Estimated fuel cost per year:	$4.4 million
Residents driving alone to work:	77%
Average commute time:	19 minutes



Electricity Use

Electricity Usage in 2015[vi]	(see figure)
Avg. Residential Usage:	5,491 KWh
Total Usage (2014-2016):	↓ 2.6 million KWh ↓ 5.5%

Energy Generation

Existing Renewable Energy Generation

Solar	18 sites	106.7 KW	130,857 KWh
Wind	0	0	0
Hydro	0	0	0
Biomass	0	0	0

Renewable Energy Generation Targets[vii]

2015 (Baseline)	130.9 MWh
2025	5,456 MWh
2035	10,913 MWh
2050	21,825 MWh

Potential for Renewable Energy Generation[viii]

Rooftop Solar	7.95 MW	9,750 MWh
Ground-Mounted Solar	197.4 MW	242,091 MWh
Wind	1,285.9 MW	3,942,569 MWh
Hydro	0.065 MW	228 MWh

[i] U.S. Census Bureau, American Community Survey (ACS) 2011-2015
[ii] Based on Scenario B population projections for 2030 (VT ACCD, 2013)
[iii] U.S. Census Bureau, Decennial Census (2010)
[iv] Vermont Department of Labor Statistics (2015)
[v] Estimated based on number of units, estimated floor space, heating fuel types and average fuel costs for 2015. Floor space was estimated from average commercial/manufacturing floor space per employee from the U.S. Energy Information Administration.
[vi] Efficiency Vermont (2017)
[vii] SWCRPC
[viii] Based upon an analysis of GIS data mapping data (i.e. land area shown on the solar and wind potential maps)

Appendix F: Act 250 & Local Act 250 Review

Act 250[1]

In the spring of 1970, the Vermont Legislature passed the Land Use and Development Act (Act 250) in order to address growth in the 1960s resulting from the opening of I-89 and I-91, development of the IBM facility in Essex Junction, and expansion of ski tourism in Vermont. Act 250 (10 V.S.A., Chapter 151) establishes a state land use permitting process in order to protect the environment.

The law created nine District Environmental Commissions, consisting of three members appointed by the Governor, to review large-scale development projects and subdivisions using 10 criteria that address environment, aesthetic and community impacts. In Ludlow, the District Environmental Commission has jurisdiction over any project that encompasses more than 10 acres, or with more than 10 housing units or housing lots (within a five-year period of time); and may also apply for construction proposed above 2,500 feet of elevation.

Act 250 also created the Vermont Environmental Court to review appeals coming from District Commission rulings.

The Act 250 process allows for the review and comment on all eligible applications by municipal governments, local and regional planning commissions, the state of Vermont, along with other interested parties. Before a proposed development receives approval it must meet the ten criteria set forth in 10 V.S.A. §6086, which are summarized below:

1. Water and Air Pollution – Will not result in undue water or air pollution. Including the following considerations:

   1(A) Headwaters – Will not reduce the quality of surface- or ground-waters in sensitive areas, such as small drainage basins, high-elevation areas, watersheds of public water supplies and aquifer recharge areas;

   1(B) Waste Disposal – Will meet state standards for waste disposal, including wastewater and stormwater; and must not involve the injection of waste materials or any harmful or toxic substances into groundwater or wells;

   1(C) Water Conservation – Must use and maintain the best available water conservation technology as practicable;

[1] Modified based on the 2009 Regional Plan for the Southern Windsor County Regional Planning Commission

1(D) Floodways – Will not endanger the public health, safety and welfare during flooding. In floodway areas, proposals will not restrict or divert the flow of flood waters. In floodway fringe areas, proposals will not significantly increase the peak discharge of rivers or streams;

1(E) Streams – Proposals along streams or rivers must maintain the natural condition of streams if feasible, and will not endanger the public health, safety and welfare;

1(F) Shorelines – Any proposal along pond or river shorelines must show development in these areas is necessary, maintain the natural condition of the shoreline, and must not diminish public access to public waters; and

1(G) Wetlands – Will not violate the Vermont Water Resources Board rules protecting significant wetlands.

2. Water Supply – Has sufficient water available for the foreseeable needs of the subdivision or development.

3. Impact on Existing Water Supplies – Will not unreasonably burden any existing water supply, if one is utilized.

4. Soil Erosion – Will not cause unreasonable soil erosion or reduce the capacity of the land to hold water.

5. Traffic – Will not cause unreasonably dangerous or congested conditions with respect to highways or other means of transportation.

6. Educational Services – Will not create an unreasonable burden on the educational facilities of the municipality.

7. Municipal or Government Services – Will not create an unreasonable burden on the local government in providing municipal and governmental services.

8. Scenic, Natural Beauty, Aesthetics, Natural Areas and Historic Sites – Will not have an undue adverse effect on aesthetics, scenic beauty, historic sites or natural areas, and

8(A) Wildlife Habitat and Endangered Species – Will not destroy or significantly imperil necessary wildlife habitat or any endangered species.

9. Conformance with a capability and development plan – Will conform with a capability and development plan, and land use plan if adopted, including the following considerations:

   9(A) Impact of Growth – The impact the project will not have an undue burden on the town or region:

   9(B) Primary Agricultural Soils – Does not significantly reduce the agricultural potential of soils rated by the Natural Resource Conservation Service of the U.S. Department of Agriculture as prime, statewide or local importance;

   9(C) Productive Forest Soils - Will not significantly reduce the potential of productive forest soils as defined in 10 V.S.A. §6001;

   9(D) Earth Resources – Will not prevent or significantly interfere with subsequent earth extraction activities;

   9(E) Extraction of Earth Resources – Will not unduly impact the environment or surrounding land uses, and require planning for site reclamation;

   9(F) Energy Conservation – Will reflect the principles of energy conservation and incorporate the best available energy conservation technologies;

   9(G) Private Utility Services – Must show that adequate legal and financial mechanisms are in place for private utilities, such as roads or wastewater facilities, when the proposal utilizes private utilities;

   9(H) Costs of Scattered Developments – Costs for public service and facilities required to serve a proposal that is not within or adjacent to a settlement area or village must not exceed the tax revenue and other public benefits generated by the development or subdivision;

   9(J) Public Utility Services – Will not place an unreasonable burden on public utility services, such as electricity;

   9(K) Development Affecting Public Investments – Will not unnecessarily or unreasonably endanger public or quasi-public investments in adjacent government and utility facilities, services and lands; and

   9(L) Rural Growth Areas – Proposals in rural areas will be designed to economize on the cost of roads, utilities and land usage in order to protect municipalities from undue financial burdens.

10. Local and Regional Plans – Is in conformance with any local or regional plan or capital budget and program.

Local Act 250 Review

In 2007, Ludlow established a Local Act 250 Review procedure in accordance with 24 V.S.A. §4420, 10 V.S.A. Chapter 151 and Natural Resource Board Rule 19, Section (I), Municipal Presumptions. Under Local Act 250 Review, the Ludlow Development Review Board (DRB) reviews projects for compliance with Criteria 6 (Educational Services), 7 (Municipal or Government Services) and 10 (Conformance with the Municipal Plan). This only applies to larger projects that need to go through the state Act 250 review process. Local Act 250 Review allows for greater local control and should streamline the state Act 250 process. (See the Ludlow Zoning Bylaws for more information.)

Appendix G: Public Outreach Summary

Comments from March 20, 2018 Public Meeting

a) We are not just a resort town. Ludlow is a town with a ski resort.
[vs. Ludlow is a service community for Okemo]
b) Okemo is the pillar of the local economy, but other businesses are important too (JELD-WEN, Clear Lake Furniture, Built Right, IMERYS).
c) Recently there is no growth, we want growth (economic, population).
d) We need a more diverse economy. We need better paying jobs. Be business friendly. Attract 1-3 larger businesses. Focus on small-scale, high-tech manufacturing. Take advantage of brownfield re-development opportunities.
e) We need housing options that are more affordable.
f) Make Ludlow a place that you want to live (bike paths, dog parks, ball fields, quality school, vibrant village).
g) Need to re-invest in the town recreation areas/parks. Open up views and access to the river and lakes.
h) Village revitalization
    1. Maintain the character of the village.
    2. Street lights, street trees, vibrant stores, decorations
    3. Consider angle parking more room for street trees (?)
    4. Slow traffic speed. Reduce the speed limit. I like Chester's speed sign that says "thank you" for driving the speed limit. Speeding on Buttermilk Falls Road in the summer. Consider speed humps to slow traffic.
    5. Safe/walkability. Sidewalk maintenance. Need enhancements of the pedestrian environment by the gas stations. Crosswalk improvements.
    6. Fill empty storefronts.
    7. Rehab "dead" houses. It is too expensive to rehab larger buildings. Explore incentives.
    8. Place telephone/power lines underground or behind buildings.
i) School is closing. Identify a good re-use for the old Black River School building. Consider establishing an independent school for grades 7-12. What is the cost to renovate?
j) Gas stations are an eye sore.
k) Fill empty storefronts
l) Improve wayfinding (e.g. golf course)
m) Improve cell phone service in all parts of town.
n) Faster internet (fiber).

Comments from July 17, 2018 Public Meeting

Elizabeth Bridgewater from Windham and Windsor Housing Trust gave an overview of their programs:

a) 759 total units
b) Stewart Property Management serves most of their properties in Windsor County
c) They offer home ownership counseling and educational services.
d) The shared equity program helps income-eligible people to buy a home through a subsidy. The subsidy continues with the subsequent owner. There are no shared equity units in Ludlow at this time.
e) They are currently working on a strategic plan, including efforts to have a greater presence/impact in Windsor County.

Issues and comments raised by attendees of this meeting included:

o) Affordability is the primary issue. Contributing factors are the second home market and property taxes.
p) Fewer young families live in Ludlow.
q) Seasonal rentals for ski industry jobs are less available. Property owners make more money through Airbnb.
r) Ludlow needs a broader employment base/diversify the economy.
s) Perhaps there is an opportunity to work with landlords to provide rentals needed to support local seasonal jobs.
t) Consider a business roundtable to talk about coordination on housing for seasonal workers. For example, rentals for ski employees in the winter, farm workers in the summer. Reach out to Bob Flint at Springfield Regional Development Corp.
u) Recruit younger adults from other areas to move here and telecommute. Internet speeds in the Village are pretty good. We need better internet speeds in some of the rural parts of town.
v) Keep coordinating with the Cavendish Telecommunications Committee and other towns in the area to improve internet speeds.
w) In Mass., there was a successful local's discount club that helped to strengthen the local economy. Consider talking with the Chamber about the feasibility of doing something like that in Ludlow.

Appendix H: Enhanced Energy Plan

Introduction

Ludlow's Enhanced Energy Plan is a component of the Ludlow Municipal Development Plan prepared in accordance with 24 V.S.A., Chapter 117, Subchapter 5. It serves both the Town of Ludlow and Village of Ludlow. The intent of this plan is to address the requirements of Act 174 of 2016 and to meet the enhanced energy planning standards developed by the Vermont Department of Public Service (DPS). This document was prepared based upon the Guidance for Municipal Enhanced Energy Planning Standards (DPS; March 2, 2017) in order for the Ludlow Municipal Development Plan to be given greater weight in the Section 248 process.

The SWCRPC developed a regional energy plan to meet these standards in order to receive Section 248 substantial deference. Ludlow coordinated the development of this municipal energy plan with the SWCRPC so that:

1. The municipal plan is informed by the regional energy planning process; and,

2. The municipal plan is compatible with the regional plan.

This Plan was developed with assistance from the Southern Windsor County Regional Planning Commission (SWCRPC) through funding provided by the Vermont Department of Public Service.

Energy Goals

Through the 2016 Vermont Comprehensive Energy Plan (CEP), the State of Vermont has identified a number of goals and strategies to achieve energy conservation throughout the state. The most significant of these goals being;

> By 2050, 90% of Vermont's total energy will be derived from renewable

The CEP includes additional goals to fully achieve the overall, long-term "90x50" goal. These goals serve as the platform for determining energy policies, targets and pathways for the Town and Village of Ludlow, as articulated throughout this plan.

Ludlow's Energy Goals

The Town and Village of Ludlow hereby adopt the goals established in the 2016 CEP, and through the detailed policies and actions contained in this plan, Ludlow will strive to achieve these goals. Below is a list of some of the methods outlined in this plan to further energy conservation and efficiency efforts within our community:

- Reducing total energy consumption throughout all sectors, including: electricity, space heating, and transportation.

- Support efforts at the local level to choose energy efficient and renewable options.
- Create a diverse mix of energy sources to reduce the impact of supply restriction.
- Utilize local, renewable sources of energy to decrease reliance on out-of-region, and out-of-state forms of fuel.
- Select energy choices that help preserve the environment.
- Strive for both an adequate supply of electricity, as well as a distribution network to meet the region's needs.
- Maximize energy efficiency by matching fuel type to end use.
- Support adaption and lifestyle changes which are consistent with changes in future energy use and generation.
- Reduce greenhouse gas emissions.

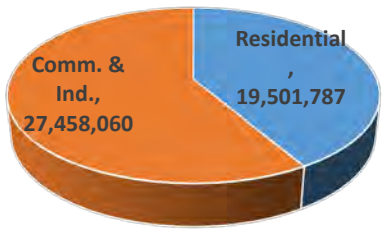
Analysis of Current Energy Use

This section involves a summary and analysis of existing conditions in Ludlow with respect to energy use. Appendix E includes more detailed data figures, which are summarized in this section. This section relies on data analysis provided by the Southern Windsor County Regional Planning Commission and, as such, the Regional Energy Plan for Southern Windsor County contains an important regional context for this analysis of Ludlow's energy use and targets.

Vermont's Comprehensive Energy Plan calls for 25% of remaining energy needs will be met by renewable sources by 2025, 40% by 2035, and 90% by 2050.

Electricity

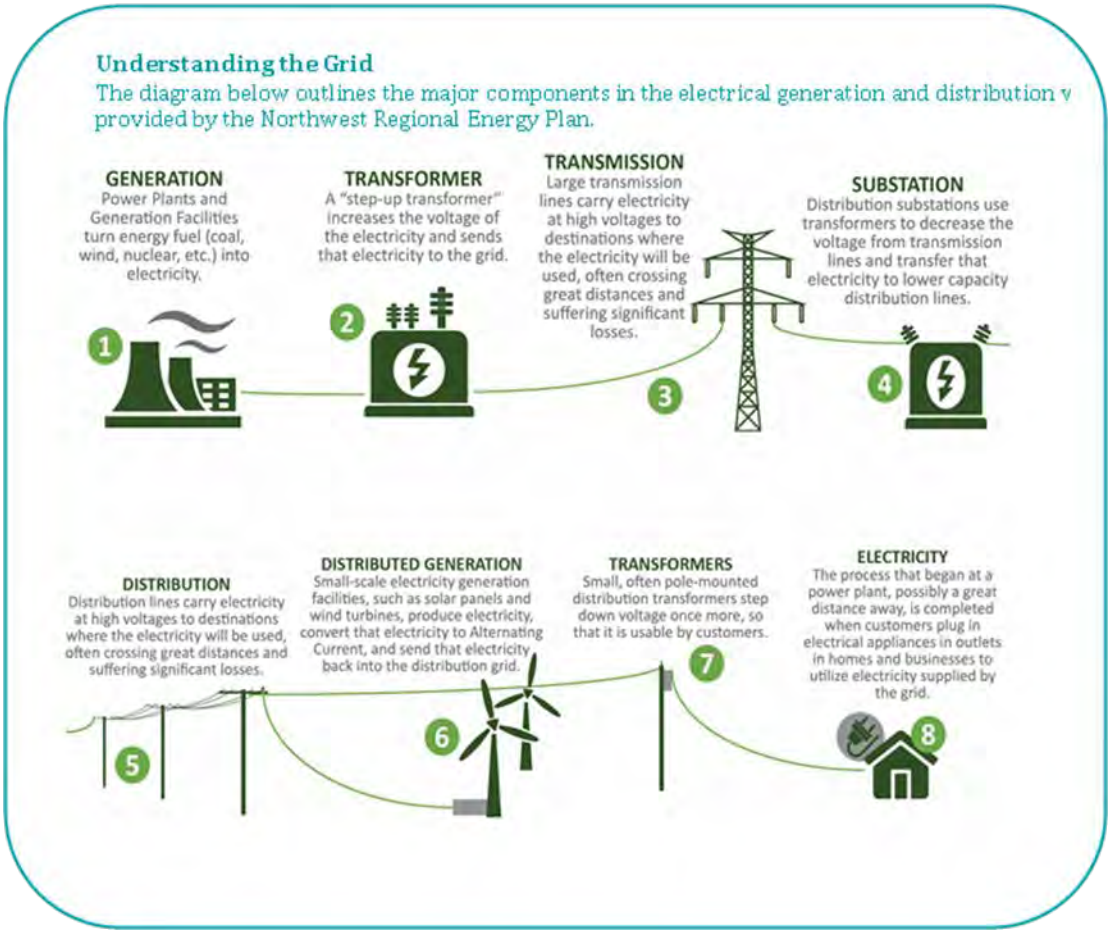
Figure 2: Current Electricity Use in Ludlow (kWh)



Electricity is provided in Ludlow Village and parts of the Town of Ludlow by Ludlow Electric, and by Green Mountain Power in the rural parts of town. Presently, two transmission lines cross east-to-west across Ludlow. A third transmission line, located in Cavendish, connects into the Coolidge Substation, which is located on the Cavendish/Ludlow town line. Utility Services Map shows these existing facilities. An additional transmission line (i.e. New England Clean Power Link) will bring electricity from Hydro Quebec and connect to the Coolidge Substation has received a Certificate of Public Good, but is not yet constructed [Docket #8400]. The Coolidge Solar project was approved [Docket #8685] and come online in 2019. It involved a short transmission line connection into the Coolidge Substation.

In 2016, residences accounted for 41.5% of the total electricity usage in Ludlow. Commercial and industrial use the remaining 58.5% of the total 46,959,847 kWh used in Ludlow that year. See Figure 2 that summarizes electricity use data provided by

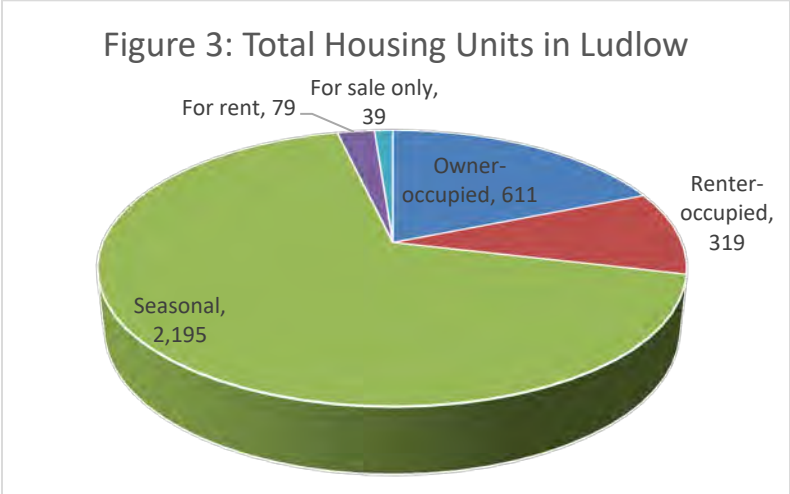
Efficiency Vermont. According to Department of Labor statistics, there are 144 commercial establishments in Ludlow. Electricity use has leveled off in recent years.



Thermal (Space Heating)

As a ski town, Ludlow has a large number of seasonal housing units. See Figure 3 which summarizes total housing units in Ludlow by type from the 2010 Census Bureau.

According to American Community Survey (ACS) data (2011-2015), the predominant ways to heat homes in Ludlow include fuel oil (61%), propane (17.9%), wood (13.1%) and electricity (6.6%). See Appendix E for home heating data, including estimates for square footage heated and BTUs. Appendix E also includes data about heating the 144



commercial establishments in Ludlow.

Transportation

Ludlow has a network of sidewalks in the village. Bicycling is generally accommodated on the shoulders of the roadway network, some of which are better suited for bicycling than others. Public transportation services are provided by Ludlow Municipal Transit[1] and The Current (Southeast Vermont Transit), with connections to Rutland via The Bus (Marble Valley Transit). In addition, Okemo provides bus service not only for employees but also extensive public ski routes in and around the village. Despite that, the automobile is the primary mode of travel in Ludlow for both commuting and for other daily travel needs, as discussed in more detail in the Transportation Chapter. Common work destinations for residents are Ludlow, Rutland and Springfield. Common home locations for the people who work in Ludlow include Ludlow, Springfield, Chester and Cavendish.

The Green Mountain Railroad hauls freight and offers scenic train excursions, but there is no passenger rail service in Ludlow at this time.

Data was compiled and is presented to understand the existing transportation energy use in Ludlow (see the Appendix E). According to ACS data, there is about 1.7 vehicles per household. The average vehicle miles traveled in a year is estimated at 20,900, which accounts for 1.9 million gallons of fuel used at a total cost of $4.9 million for fuel.

Scenarios (Targets)

The standards that the Department of Public Service has established for targets must be met if this Plan is to receive substantial deference in Section 248 energy siting proceedings[2]. Ludlow is utilizing targets (or scenarios) developed using the Long-Range Energy Alternatives Planning (LEAP) Model and provided to Ludlow by the SWCRPC. The background for the targets are described in more detail in the 2018 Southern Windsor County Regional Energy Plan. The purpose of the targets, when combined with the analysis presented in the previous section, are intended to provide an overview of existing energy use and projections for the pace of change that is needed over the next three-plus decades. In order to meet 90% of Vermont's energy need from renewable sources by 2050, a significant amount of conservation efforts and the development of new renewable energy generation will be necessary.

In order to meet the 90% by 2050 goal, total energy use in southern Windsor County will need to decrease by 50%. Primarily this must involve a vast reduction in the use of non-renewable fuels, such as gasoline and fuel oil. At the regional level, the LEAP model includes the following generalized assumptions to reach the 90% by 2050 goal:

- Electricity use today is about 20% of total energy consumption, but it will increase to 35% of total consumption in 2050;

[1] Ending in 2020

[2] A Certificate of Energy Compliance was issued for Ludlow's Plan on February 11, 2019

- The use of non-renewable fuels will be vastly reduced from about two-thirds today to about 10% by 2050;
- Renewables will increase from about 18% now to more than half by 2050. This involves wood consumption remaining relatively constant and biodiesel usage increasing substantially.

Electricity

Targets for electricity are mixed. Significant efforts to reduce electricity usage through conservation and efficiency measures will be needed. However, the LEAP model utilizes increased use of electricity to achieve the goal for both transportation (i.e. electric vehicles) and space heating (i.e. cold-climate heat pumps). See Figure 1.

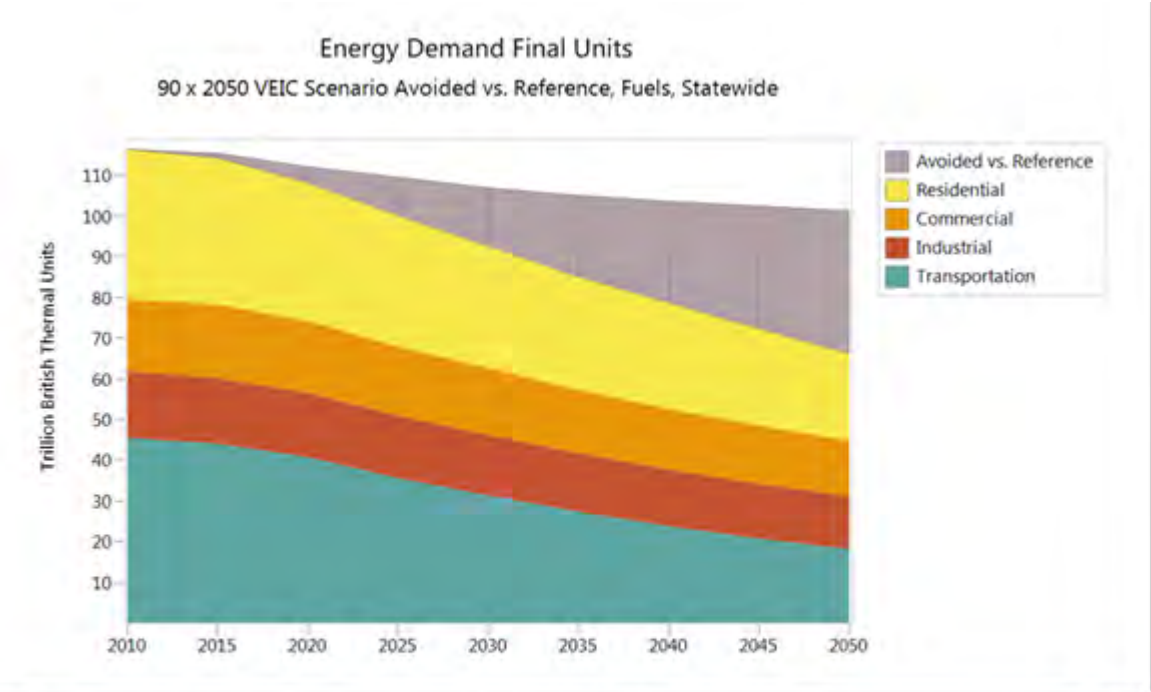


Figure 1: Vermont must significantly reduce total energy use by 2050 to be successful in implementing the goals of the Comprehensive Energy Plan. The LEAP model referenced in this Plan calls for substantial reductions in energy use by residences and transportation. The line above the grey area represents projections for if we do nothing else to reduce energy demand. The grey area itself represents efforts needed to reduce total energy demand.

Reducing electricity demand through energy conservation and efficiency measures will involve taking advantage of programs offered by Efficiency Vermont, utilization of high-efficiency/energy star appliances, LED lighting upgrades, and other efforts at energy demand management.

Electricity targets also include the development of renewable energy generation in Ludlow and the surrounding region. The LEAP model also includes additional imported renewable energy from sources such as Hydro Quebec. However, local generation is also required. Targets for local renewable generation are summarized below in Table 1

and discussed in more detail in the renewable siting discussion in the Implementation Actions section.

Table 1: Renewable Generation Targets (in MWh)

	2025	**2035**	**2050**
Total renewable generation in MWh	5,456.25	10,912.5	21,825

Thermal (Space Heating)

The first step to reduce energy demand for space heating is to encourage homes and businesses to be weatherized (e.g. air sealing, insulation). Table 2 shows the targets for weatherizing existing structures in Ludlow in both percentage of the total existing households and commercial buildings and the number of units of each. We assume that all new structures will comply with the State energy building codes.

Table 2: Thermal Efficiency Targets

	2025	**2035**	**2050**
Weatherize Homes (percentage,	17%	31%	63%
number)	162	296	602
Weatherize Commercial	4%	7%	15%
Establishments	6	10	22

The next step is to move toward the widespread utilization of renewable energy to heat homes and businesses. The LEAP model established the following targets for doing so in Ludlow. Table 3 shows the scale to which buildings should switch over to renewable heating systems in order to meet the state energy goals.

Table 3: Use of Renewables for Space Heating

Thermal renewable energy use	**2025**	**2035**	**2050**
	48%	63%	93%

In order to achieve the overall renewable target for heating, the LEAP model is calling for investing in new efficient wood heating systems, cold-climate heat pumps or ground-source heat pumps. (See Table 4.)

Table 4: Thermal Fuel Switching Targets (by Number of Heating Units)			
	2025	**2035**	**2050**
New efficient wood heating systems	7	18	143
New heat pumps	313	846	1,630

Cold-climate heat pumps are also referred to as air-source heat pumps, mini-splits or ductless heat pumps. These systems are a good option to retrofit existing houses, and can be used to supplement the existing heating system. As explained on the Efficiency Vermont website, "heat is collected from the exterior air, concentrated via an outdoor compressor, and distributed inside through an indoor room unit. Heat pumps require electricity to run, but can deliver more energy than they use." They also provide air conditioning during the warmer months.

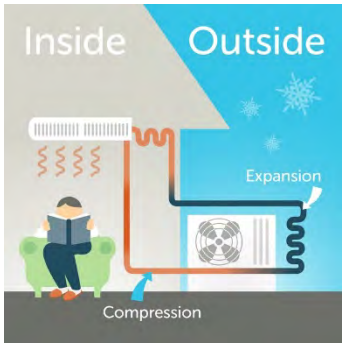


Figure 1: Illustration of how cold-climate heat pumps work. Source: Efficiency Vermont.

Ground-source heat pumps provide space heating and cooling. It works similarly to an air-source heat pump, but instead pumps water or other fluid through pipes buried in the ground to collect heat. A more detailed description for how these systems work can be found on the US EPA website. These are generally a better option for new construction installations.

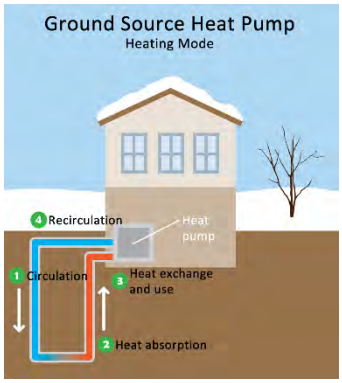


Figure 2: Illustration of how ground-source heat pumps work. Source: US EPA.

Heating with wood is common. Wood is a locally-available fuel. However, sustainable wood harvesting is an important consideration to protect the environment and provide a viable, long-term local energy source. New efficient wood stoves that are EPA-certified are encouraged. Wood-chip heating systems are considered a good option to heat larger commercial, industrial or institutional buildings. See the Efficiency Vermont website for more information. A number of schools in the region use such heating systems.

Transportation

Transportation is probably the most difficult area to "bend the curve" in order to meet the energy goals. Changing behaviors is challenging. However, it must be done if we are to achieve the 90% by 2050 goal. The LEAP model used a number of assumptions in addressing this issue. The following targets are based on that LEAP model.

Table 5: Renewable Energy Use for Transportation			
	2025	**2035**	**2050**
Use of renewables for transportation	10%	31%	90%

Overall, transportation needs to shift to renewable fuel sources as shown in Table 5. The LEAP model is largely expecting this to happen through using electric vehicles, and the use of biodiesel by the trucking industry. Table 6 below shows the fuel switching targets for Ludlow. Efficiency Vermont has information on its website about ways to achieve transportation efficiencies. Also required to meet the goals will be additional efforts to lessen the use of energy for transportation, including land use patterns that encourage walking and bicycling, public transportation, driving less and ride sharing.

Table 6: Transportation Fuel Switching Targets			
	2025	**2035**	**2050**
Passenger cars switch to electric vehicles	139	955	1,965
Trucks switch to biodiesel	240	447	744

Implementation Actions (Pathways)

In order to meet our stated energy goals and targets, the Town and Village of Ludlow identify the following implementation actions, also referred to as "Pathways". The reference numbers used in this section are intended to be consistent with those used in the Guidance for Municipal Enhanced Energy Planning Standards (VDPS; March 2, 2017).

Pathways Standard 6: Conservation and Efficient Use of Energy

a) The Town and Village of Ludlow encourage the conservation and efficient use of energy.

Ludlow has identified the following implementation actions in Sections 6A, 6B, 6C and 6D to achieve this policy.

6A: Encourage Conservation by Individuals and Organizations

Ludlow cannot control the use of energy by individuals and organizations. However, the Town and Village can lead by example, serve as a resource, and encourage individuals

and organizations to conserve and use energy efficiently. To do so, Ludlow identifies and promotes the following resources to provide guidance to individuals and organizations:

a) Inform residents and businesses about available programs that can assist with energy conservation and efficiency improvements, including:
    1) Programs available through Efficiency Vermont, such as workshops and educational opportunities to businesses on efficiency in new construction, retrofits, and conservation practices; and,
    2) Weatherization Assistance Program through SEVCA for low-income households.
b) Inform residents about Efficiency Excellence Network (EEN) contractors by providing links to EEN information through the municipal website.

6B: Promote Efficient Buildings

Heating buildings accounts for about 30% of all energy consumed in Vermont. Creating more efficient buildings can be achieved through weatherization and high-performance building methods. Ludlow identifies the following to encourage efficient buildings:

a) Promote the use of Vermont's residential building energy label/score.
b) Promote the use of the residential and commercial building energy standards:
    1) The Planning and Zoning Office will distribute State energy code information to all applicants seeking a zoning permit for a structure that is heated or cooled.
    2) The Planning and Zoning Office will not issue a certificate of occupancy until the applicant provides a certificate that ensures compliance with the State energy code.
c) Promote benchmarking (using the free EPA Portfolio Manager tool and/or with assistance from Efficiency Vermont) for commercial buildings.
d) Encourage that all residential and commercial projects follow the stretch energy code or guidelines (see Appendix A in the RBES and Commercial Stretch Building Energy Guidelines).
e) Encourage new development to maximize energy efficiencies and to accommodate renewable energy systems. If unable to install renewable energy systems at the time of construction, projects should enable future installation of such systems (i.e. renewable energy ready homes, zero energy ready homes).
f) Consider providing incentives (e.g. density bonuses) to developments located in an area identified as appropriate for growth that exceed the state's energy code.
g) Promote the use of landscaping for energy efficiency.

6C: Promote Decreased Use of Fossil Fuels for Heating

Heating buildings accounts for about 30% of all energy consumed in Vermont and is the second largest contributor to greenhouse gas emissions. Home heating is heavily reliant on fossil fuels at this time. Solutions to address this situation involve high-efficiency heating system upgrades and fuel switching. Ludlow identifies the following to encourage using less fossil fuels to heat buildings:

a) Provide educational presentations on ways to decrease the use of fossil fuels, in coordination with Efficiency Vermont and Ludlow Electric.
b) Promote the use of cold-climate heat pumps for retrofitting existing buildings.
c) Support the use of ground-source heat pumps for new construction.
d) Promote wood stove change-out programs that take older non-EPA certified stoves out of service and replace them with more efficient and lower emitting cordwood or pellet stoves.
e) If renewable energy systems are not practicable, encourage homeowners to replace old furnaces or boilers with a high-efficiency model.

6D: Demonstrate the Municipality's Leadership by Example with Respect to the Efficiency of Municipal Buildings

Ludlow wishes to lead by example and demonstrate to individuals and organizations the benefits of building efficiency through the following efforts:

a) Seek support and guidance from Efficiency Vermont for efforts to improve the efficiency of municipal buildings.
b) Assess the life cycle costs of potential energy improvements during design and construction planning. For example, investment in a new, efficient heating system may be more expensive up front, but more economical to operate over time.
c) Incorporate weatherization/energy efficiency projects into the municipal Capital Budget and Program.
d) The municipality will construct all new public buildings according to standards of energy efficiency at least equivalent to U.S. EPA Energy Star rating or similar certification where it can be demonstrated to be cost-effective.

Pathways Standard 7: Transportation

a) The Town and Village of Ludlow encourage the reduction of transportation energy demand and single-occupant vehicle use.
b) The Town and Village of Ludlow encourage the use of renewable or lower-emission energy sources for transportation.

Ludlow has identified the following implementation actions in Sections 7A, 7B, 7C, 7D and 7E to help achieve these policies.

7A: Encourage Increased Use of Public Transit

Ludlow operates a municipal public transit service and maintains a municipal park-and-ride lot. Two other public transit operators have routes that serve Ludlow and the additional services provided by Okemo. Maximizing public transit ridership is a priority. Ludlow will implement the following actions to encourage public transit:

a) Improve awareness of existing public transit services and taxi service to residents and visitors.
b) Assess the coordination of existing services and schedules of the different public transit providers that serve the municipality.

c) Plan and advocate for access to public transit, especially during the permit review process for all larger developments.

7B: Promote a Shift Away from Single-Occupancy Vehicle Trips

Public transit can meet the needs of some mobility needs, but additional efforts will be needed in order to reach the energy goals for reducing transportation energy use. Ludlow will work to encourage the following actions to encourage a reduction in single-occupant vehicle trips:

a) Encourage improved internet connectivity and speed, especially in the rural parts of Ludlow, in order to enable telecommuting by all residents.
b) Promote the Go Vermont webpage, which provides rideshare, vanpool, public transit and park-and-ride options.
c) Support employer programs to encourage telecommuting, carpooling, vanpooling, walking and bicycling for employees' commute trips. Encourage employers to offer such programs and provide information on tax benefits that may be available for doing so.

7C: Promote a Shift Away from Gas/Diesel Vehicles to Electric of Other Non-Fossil Fuel Transportation Options

To meet State energy goals, municipalities will need to contribute toward efforts to reduce the number of vehicle-miles traveled (see 7B), and switch to renewable, non-fossil fuel transportation options. Ludlow has identified the following pathways to shift toward electric vehicles and other non-fossil fuel travel:

a) Increase awareness of the benefits of electric vehicles and alternative-fuel vehicles through education and outreach efforts.
b) Seek grants to fund the installation of electric vehicle charging infrastructure at strategic locations along major travel corridors and in transit hubs such as park-and-ride locations.
c) Encourage the use of the biodiesel in all diesel vehicles without compromising the manufacturer's engine warranty.

7D: Facilitate the Development of Walking and Biking Infrastructure

Active transportation, such as walking and bicycling, offers significant health benefits and requires no outside energy resources. Ludlow seeks to encourage completing short trips by walking or bicycling instead of by driving, by planning for safe and convenient infrastructure that support "Complete Streets Principles". In order to do this, Ludlow has identified the following pathways:

a) Maintain roads in order to better accommodate travel by bicycles. For example, this includes paving/overlays to maintain a smooth roadway surface as well as sweeping to remove sand, dirt and trash multiple times a year.
b) Update municipal road standards (for maintenance and new construction) to reflect complete streets principles.
c) Continue to maintain existing walking and bicycling infrastructure in good condition, and seek funding to make strategic improvements to these networks.

7E: Demonstrate the Municipality's Leadership by Example with Respect to the Efficiency of Municipal Transportation

In order to meet the State energy goals, municipalities should lead by example and demonstrate to individuals and organizations the benefits of energy efficiency in transportation. Ludlow wishes to do so through the following ways:

a) Install electric vehicle charging infrastructure on municipal properties.
b) Establish minimum fuel efficiency standards for the purchase of new vehicles.
c) Provide incentives for employees who commute using methods alternative to single occupancy vehicles, e.g. walking, biking, public-transit, and carpooling.

Pathways Standard 8: Land Use Patterns and Densities

a) The Town and Village of Ludlow encourage maintaining the historic settlement pattern of compact village centers surrounded by rural countryside in accordance with 24 V.S.A. §4302.
b) The Town and Village of Ludlow recognize that compact development has a number of benefits, including furthering both State planning goals and State energy goals.
c) The land use section of the Ludlow Municipal Development Plan (i.e. Section 6: Plan for our Future) encourages the types of land use patterns and densities that are likely to result in the conservation of energy.
d) Zoning bylaws adopted by the Town and Village (separately) enable the above land use patterns and densities.
e) The State Downtown Board has designated the Village core area as a Village Center under 24 V.S.A. Chapter 76A.

The DPS anticipates that if municipalities are actively participating in the above statutory frameworks for community planning, they will likely meet Pathways Standard 8. Ludlow hereby documents what the municipalities are doing in this area as it relates to encouraging the conservation of energy through land use development patterns and densities.

8A: The Plan Includes Land Use Policies (and Descriptions of Current and Future Land Use Categories) that Demonstrate a Commitment to Reducing Sprawl and Minimizing Low-Density Development

According to the enhanced energy planning guidance, the reduction of sprawl and low-density development not only reduces energy consumption but also can improve the local and regional economy.

a) The land use section in the Municipal Development Plan generally calls for growth to occur in the Village Mixed Use area and in discrete nodes of activity, including the Residential-Commercial and Industrial areas, and the Jackson Gore Recreational District. (See Section 6: Plan for our Future and the corresponding Future Land Use Map.)
b) Also included in the land use section of the Municipal Development Plan is a statement that discourages sprawl and strip development in the Rural Residential area.

c) The transportation section of the Municipal Development Plan (Section 5.3) addresses access management. It notes that VT Route 103 south of the Village and VT Route 100 just north of VT Route 103 both exhibit emerging strip development, and promotes sound access management to address those concerns.
d) Ludlow has conducted a sidewalk inventory that assesses existing condition, and has actively been working to seek funding to make sidewalk improvements over the past few years.

8B: Strongly Prioritize Development in Compact Mixed-Use Centers

As indicated in the enhanced energy planning guidance, households within a compact, mixed-use center typically use less energy than those located in outlying areas. The energy savings are realized through reduced vehicle-miles-traveled and generally smaller homes, which require less energy to heat and cool. Transportation energy use can be further reduced by locating services such as shopping or daycare within walking or biking distances to the places that people work and live. This enables people to either choose an alternative to driving a single-occupancy vehicle or to significantly reduce the length of their drive. Ludlow choses to encourage this by:

a) Maintaining Village Center Designation, and improving the awareness of property owners of the tax credit opportunities to help pay for improvements to eligible buildings within Ludlow's Village Center.
b) Coordinating with large employers and larger developments to discuss options to promote car-sharing and public transit services, and to install electric vehicle charging stations in convenient locations, such as within the Village Center, municipal park and ride lot or at the ski resort.
c) Incorporating priority sidewalk investments, multi-use path needs, parking, and other infrastructure improvements into the Capital Budget and Program in order to support village revitalization.

Pathways Standard 9: Statement of Policy on the Development and Siting of Renewable Energy Resources

The heating, transportation and conservation targets and pathways combined are not sufficient to meet the 90% by 2050 energy planning goal. The LEAP model also assumes the purchase of additional out-of-state renewable energy will help to reach this goal; however, that is also not sufficient to meet the energy goals. New local renewable energy generation is also needed in order to achieve the ambitious "90 by 50" energy goal. The following sections discuss how the municipality wishes renewable energy generation to take place in Ludlow.

9A: Evaluate Existing Renewable Energy Generation

There were 18 known existing solar sites in Ludlow in the 2015 baseline year for this plan, representing 106.7 kW of installed capacity and 130,857 kWh of generation output. There are two known wind turbines in Ludlow at this time; the one off Bixby Roads is net-metered, the one off Holby Road is not. There are no other renewable

energy generation sites in Ludlow included in the baseline conditions for the purpose of this plan. In other words, there are no known hydro power or biomass power facilities in Ludlow currently.

There have been proposals in the past to develop biomass or solar generation facilities in the Dean R. Brown Industrial Park, but no such projects are formally being considered at this time.

The Coolidge Solar project was completed and online in 2019. In August 2019, there are 28 solar sites in Ludlow that have a combined annual electricity generation of 24,504 MWh, which already exceeds Ludlow's 2050 target.

9B: Analyze Generation Potential from Preferred Sites and/or Potentially Suitable Areas

An analysis of renewable energy generation potential was conducted for Ludlow by the SWCRPC. This consisted primarily of an analysis of existing and available GIS mapping data based upon the guidelines established by the DPS for enhanced energy planning. Table 7 below summarizes the findings of this analysis.

Table 7: Potential Renewable Energy Generation

Type	**Installed Capacity (MW)**	**Generation Output (MWh)**
Roof-top Solar	8	9,747
Ground-mounted solar	197	242,122
Wind	1,286	3,942,577
Hydro	0.01	28
Total	**1,491.01**	**4,194,474**

Based upon this analysis, there is significant potential to generate power from renewable sources in Ludlow, primarily through ground-mounted solar and wind. Potential from hydro and rooftop solar projects is limited. Without ground-mounted solar and/or some forms of wind, there is not adequate generation potential from hydro and rooftop solar to meet the "90 by 50 goal" alone.

9C: Identify Sufficient Land for Renewable Energy Development to Reasonably Reach the 2050 Targets

Table 1 summarizes Ludlow's overall targets for renewable energy generation. There is more than an adequate land area in Ludlow that has potential for solar power to meet our 2050 renewable energy target of 21,825 MWh. That is the equivalent of approximately 17.8 MW of ground-mounted solar at the installed capacity. The guidance assumes 8 acres of land is generally needed to support 1 MW of solar. This

would amount to about 143 acres of land to meet this target. This represents about 9% of the total land area in Ludlow that is estimated to have potential to generate solar power.

A mix of renewable generation types are desirable in order to meet the overall renewable targets for Ludlow. The following more detailed targets represent one scenario for how Ludlow can meet the overall renewable generation target for the municipality. Rooftop solar is desirable. Ground-mounted solar is encouraged in the rural parts of Ludlow only as long as it meets our siting criteria as articulated in this plan. Residential-scale wind is also encouraged in the rural parts of Ludlow only.

Retrofitting existing dams with hydro-power generation facilities is acceptable. We assume that creating new hydro facilities is not feasible considering the existing permitting situation. A biomass facility may be acceptable if it is located in the industrial park and can demonstrate that an adequate and sustainable fuel supply is available and that the fuel transport does not cause undue impacts on the affected infrastructure or neighborhoods.

9D: Ensure that Local Constraints do not Prohibit or Have the Effect of Prohibiting the Provision of Sufficient Renewable Energy to Meet State, Regional or Local Targets

Local constraints for renewable energy generation are as summarized in this section. These constraints have been analyzed, and the Town and Village of Ludlow do not believe that these constraints prohibit or have the effect of prohibiting sufficient renewable projects needed to meet the state, regional or local energy goals.

The following resources are not appropriate locations for renewable energy projects and are hereby excluded from the potential wind and solar sites as depicted on the map:

a) Vernal pools with a surrounding 50 foot buffer;
b) DEC river corridors;
c) FEMA floodways;
d) State significant natural communities and rare, threatened and endangered species;
e) National wilderness areas; and,
f) Class 1 and Class 2 wetlands.

Ludlow has determined that ground-mounted solar and wind turbines at all scales are not appropriate within the state-designated Village Center district and the Preservation District (as depicted on the Official Zoning District Map in effect at the time of the application).

Only residential-scale renewable energy projects are appropriate for the remainder of the area within the Incorporated Village of Ludlow.

The following represent constraints that will require mitigation and which may prove a site unsuitable after a site-specific study has been conducted based upon state, regional or local policies that are adopted and currently in effect.

a) Agricultural soils (NRCS-mapped prime agricultural soils, soils of statewide importance or soils of local importance);
b) Act 250 agricultural soil mitigation areas;
c) FEMA special flood hazard areas (floodplain);
d) Protected lands (state fee lands and private conservation lands);
e) Deer wintering areas;
f) ANR conservation design highest priority forest blocks; and,
g) Hydric soils.

In addition, all renewable energy projects within Ridgeline Overlay District (as depicted on the Official Zoning District Map in effect at the time of the application) must demonstrate that they have taken adequate measures to mitigate their visual impacts as discussed in more detail in the Scenic Resources section of the Ludlow Municipal Development Plan.

9E: Statements of Policy to Accompany Maps

Ludlow hereby promotes the development of renewable energy generation in order to achieve the energy goals and targets as established in this plan. The following statements of policy apply to renewable energy projects:

a) Ludlow supports rooftop solar projects.
b) Ludlow supports residential-scale wind turbines located outside of the Incorporated Village Boundary, provided they meet all other applicable standards in this section.
c) Ludlow is willing to consider additional larger renewable energy projects (i.e. commercial- or utility-scale wind and solar projects over 500kW in capacity) if the proposed project clearly benefits rate payers in Ludlow and meets the other standards in this plan.
d) Biomass facilities, ground-mounted solar projects and wind turbines must not be located in the following areas:
    1. Vernal pools with a surrounding 50 foot buffer;
    2. River corridors as most recently mapped by the Vermont DEC;
    3. FEMA floodways;
    4. State significant natural communities and rare, threatened and endangered species;
    5. National wilderness areas;
    6. Class 1 and Class 2 wetlands;
    7. State-designated Village Center district;
    8. Preservation District as depicted on the Official Zoning District Map in effect at the time of the application; and,
    9. Within view of the Scenic Route 100 Byway.
e) Residential-scale wind turbines shall be allowed within the Village of Ludlow, outside of the state-designated Village Center and Preservation District.
f) Biomass or ground-mounted solar projects must demonstrate that the proposed project siting is appropriate in scale as it relates to the character of the area in which it is to be located, and the applicant must also demonstrate that all reasonable options have been considered in siting the facility.

g) All ground-mounted solar projects must meet or exceed the setback standards is 30 V.S.A. §248(s).
h) Any biomass facility and all ground-mounted solar projects of 150 kW or greater that are within view of public roadways (i.e. state highways, US routes, and Class 1, 2 and 3 town highways) must provide adequate landscaping in order to screen the project from the view of the traveling public.
    1. This landscaping must consist of a mix of native plants that provide adequate screening during all months of the year (i.e. conifers or a mix of deciduous and conifers).
    2. All landscaping materials must be planted at a size that provides adequate screening immediately.
i) The applicant must maintain any required landscape mitigation for the entire life of the project, including the replacement of any dead or diseased vegetation serving as part of the landscape mitigation measures throughout the life of the project or until the project ceases commercial operation.
j) The applicant must provide a plan for the site to be adequately decommissioned at the time when the project ceases commercial operation. This would involve the removal of all parts of the project from the site including, but not limited to, the solar panels or wind turbine, inverters, metal framework that supports the solar panels, fencing, and any necessary site reclamation.
k) Ground-mounted solar facilities and wind turbines must not have undue adverse impacts on significant wetlands, significant wildlife habitat, wildlife travel corridors, stormwater, water quality, flood resiliency, important recreational facilities or uses, scenic resources identified in this plan, or inventoried historic or cultural resources. Project proposals must consider placement of such facilities in locations where aesthetic and wildlife impact is minimal or employ reasonable measures to mitigate undue adverse impacts.

9F: Maximize the Potential for Renewable Generation on Preferred Locations

Preferred locations include specific areas or parcels that are specifically identified to indicate preferred locations for siting a generator or a specific size of type of generator. Identifying preferred sites informs the community where renewable generation is desired. The identification of such sites can help to streamline the permitting process.

Preferred sites for Ludlow include:
a) A canopy over paved parking lots;
b) Brownfield sites;
c) Disturbed portions of extraction sites (i.e. gravel pit, quarry); and,
d) Vacant parcels located within the Dean R. Brown Industrial Park.

9G: Demonstrate the Municipality's Leadership by Example

The Town and Village of Ludlow will lead by example by working with the Ludlow Economic Corporation and other partners to identify opportunities for local renewable energy generation that benefits the community and furthers the goals and policies of this plan.

Implementation Matrix for the Ludlow Municipal Development Plan

Action Plan Recommendation	Section in Town Plan	Responsible Party	Expected Timing				Priority of Need (Low, Medium, High)	Generalized Cost Estimate	Method of Financing
			Ongoing	0-2 Years	3-5 Years	5-10 Years			
Review and update zoning and subdivision bylaws in order to improve consistency with the updated Municipal Development Plan.	*Various*	*Planning Commission*		*X*			*High*	*Low*	*Grant (MPG), RPC dues and/or volunteer effort*
Educate landowners about programs that can help to protect important farm or forest lands, such as conservation easements, Vermont's Use Value Appraisal (or Current Use) Program, and Vermont's Forest Legacy Program.	*4.2, 4.3*	*Planning Commission*	*X*				*Low*	*Low*	*No funding needed*
Identify existing buildings located within flood and erosion hazard areas (i.e. regulatory floodway, floodway fringe, and fluvial erosion hazard areas) that have experienced repeated flood damage, and explore options to mitigate future flood or erosion hazards for those properties.	*4.5*	*Planning & Zoning Dept.*			*X*		*Medium*	*Low*	*Grant (various)*
Investigate options to better protect the river corridors, such as preserving or restoring the river channel access to the surrounding floodplains, reducing flood flows with streambank buffers, protection of channel-contiguous wetlands, preserving or supporting a return to more natural channel dimensions, and avoiding new development and infrastructure within river corridors.	*4.5*	*Planning Commission*				*X*	*Medium*	*Medium*	*Grants (various)*

Action Plan Recommendation	Section in Town Plan	Responsible Party	Expected Timing				Priority of Need (Low, Medium, High)	Generalized Cost Estimate	Method of Financing
			Ongoing	0-2 Years	3-5 Years	5-10 Years			
Coordinate with the SWCRPC, VT Agency of Natural Resources, Black River Watershed Association, Lake Association to implement the Tactical Basin Plan.	*4.5*	*Municipal Manager, Planning & Zoning Dept., Planning Commission*	*X*				*Medium*	*Low-Medium*	*Grants (various)*
Coordinate with the Windham & Windsor Housing Trust to promote their existing programs and address local housing issues.	*5.1*	*Planning Commission*	*X*				*High*	*Low*	*Volunteer efforts, Grants (various)*
Consider providing tax incentives for property owners to provide long-term rentals, as opposed to short-term rentals, in order to provide better housing options for employees of local businesses.	*5.1*	*Municipal Manager, Village Trustees, Selectboard*		*X*			*Medium*	*Medium*	*TBD*
Evaluate adopting a short-term rental ordinance.	*5.1*	*Planning Commission*		*X*			*Low*	*Low*	*Grants (MPG)*
Promote the tax credit programs available to property owners to help finance investment in eligible buildings for income-producing uses (e.g. retail, restaurants, professional offices, apartments).	*5.2*	*Planning & Zoning Dept.*	*X*				*Medium*	*Low*	*No funding needed*
Work with partner groups (Okemo Valley Chamber of Commerce, Springfield Regional Development Corporation, Ludlow Economic Corporation, Okemo Mountain Resort) to market the area.	*5.2*	*Municipal Manager, Planning & Zoning Dept.*			*X*		*Medium*	*Medium*	*Grant (USDA Rural Business Development Grant)*

Action Plan Recommendation	Section in Town Plan	Responsible Party	Expected Timing				Priority of Need (Low, Medium, High)	Generalized Cost Estimate	Method of Financing
			Ongoing	0-2 Years	3-5 Years	5-10 Years			
Complete a village revitalization master plan	*5.2*	*Planning Commission, Village Trustees, Municipal Manager, Planning & Zoning Dept.*		*X*			*Medium*	*Medium*	*Grants (Better Connections Program, Vermont Community Development Program)*
Maintain Village Center Designation, or consider applying for Downtown Designation, in order to help achieve the goals of the Plan.	*5.2, 6.2*	*Municipal Manager, Village Trustees*			*X*		*Medium*	*NA*	*No funding needed*
Establish local funding to support village revitalization (e.g. revolving loan fund, capital reserve funds).	*5.2, 6.2*	*Municipal Manager, Village Trustees, Selectboard*	*X*				*Medium*	*Medium*	*TBD*
Work with the Okemo Valley Chamber of Commerce, local businesses, The Current and other partners to explore options for public transit service enhancements and/or car sharing, such as Uber.	*5.3*	*Municipal Manager*	*X*				*Low*	*Low*	*Grants (FTA 5311)*
Study the feasibility of merging the Village of Ludlow with the Town of Ludlow. Consider working with VLCT or MRI if objective third party analysis is needed/desired.	*5.4*	*Municipal Manager, Village Trustees, Selectboard*		*X*			*Low*	*Low*	*General Funds*

Action Plan Recommendation	Section in Town Plan	Responsible Party	Expected Timing				Priority of Need (Low, Medium, High)	Generalized Cost Estimate	Method of Financing
			Ongoing	0-2 Years	3-5 Years	5-10 Years			
Update the Capital Budget and Program, and seek funding to implement high priority municipal facility capital projects as identified in this plan.	*5.3, 5.4*	*Municipal Manager, Village Trustees, Selectboard, Dept. Heads*		*X*			*Low*	*Low*	*Grants (various)*
Develop an open space or community recreation plan to inventory facilities, explore opportunities, identify priority improvements, and establish clear implementation steps.	*5.4*	*Planning Commission, Recreation Commission*			*X*		*Low*	*Low-Medium*	*Grant (Better Connections Program, Municipal Planning Grant)*
Work with neighboring communities that are actively exploring improved internet and cell phone services. Explore opportunities such as through grants (e.g. Connectivity Initiative) or by establishing Broadband Districts.	*5.4*	*Municipal Manager, Village Trustees, Selectboard*		*X*			*High*	*High*	*Grants (Northern Borders, Connect America)*
Evaluate the feasibility of providing and/or using alternative energy sources for power, transportation and building environment	*Appendix H*	*Planning Commission*		*X*			*Medium*	*Low-Medium*	*Grants*