



**VERMONT
COMMUNITY
THERMAL
NETWORKS**

THERMAL ENERGY NETWORKS

Sharing Heat in Our Communities



VERMONT COMMUNITY THERMAL NETWORKS

Advancing equitable, sustainable heating and cooling

A STATEWIDE UMBRELLA FOR ADVANCING COMMUNITY-LED THERMAL ENERGY NETWORKS IN VERMONT

- Bringing needed expertise together with local, regional, and state leaders
- Engaging communities, developing projects, and supporting opportunities to scale this solution
- Coordinating with other Vermont organizations, coalitions, and state and national networks

State & Regional Partners

- Energy Action Network
- Efficiency Vermont
- VEIC: Vermont Energy Investment Corporation
- VECAN: Vermont Energy & Climate Action Network
- Vermont Bond Bank
- Vermont Economic Development Authority
- Regional Planning Commissions
- Regional Economic Development Corporations





The Basics

- Heat & moving heat
- Ground source heat pumps
- Thermal Energy Networks

What's happening in VT

- Geothermal systems
- Thermal Energy Network development

What's possible: Shelburne

- Resources
- Opportunities

Discussion

Heat is a precious resource.



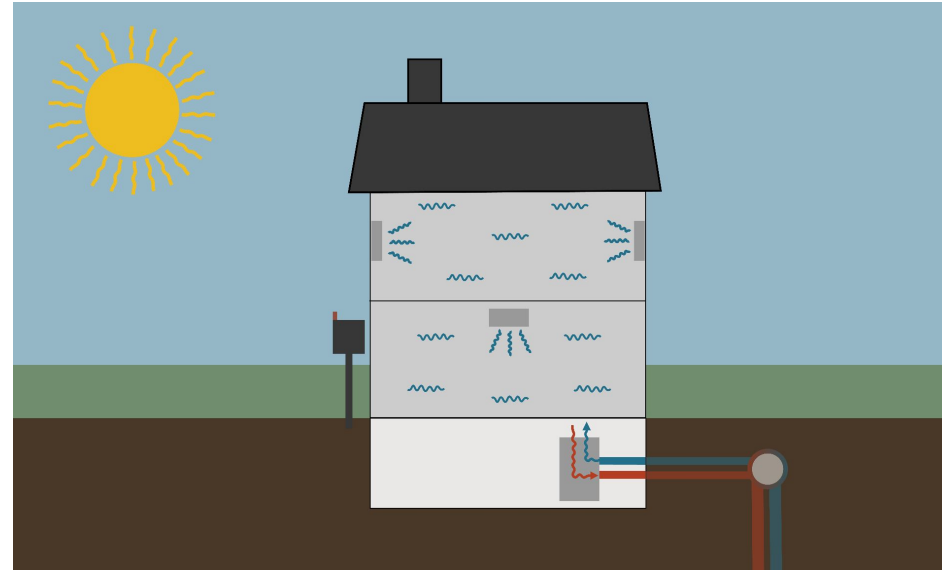
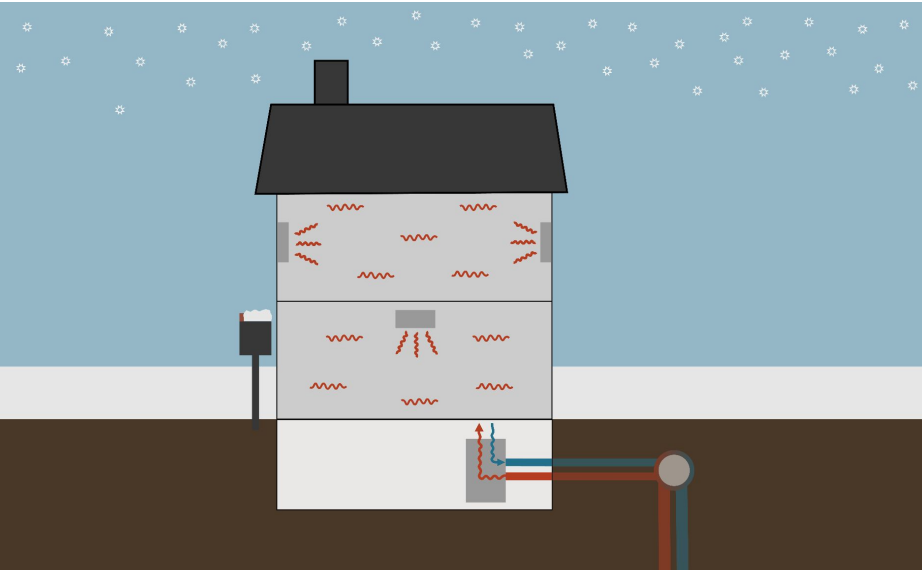




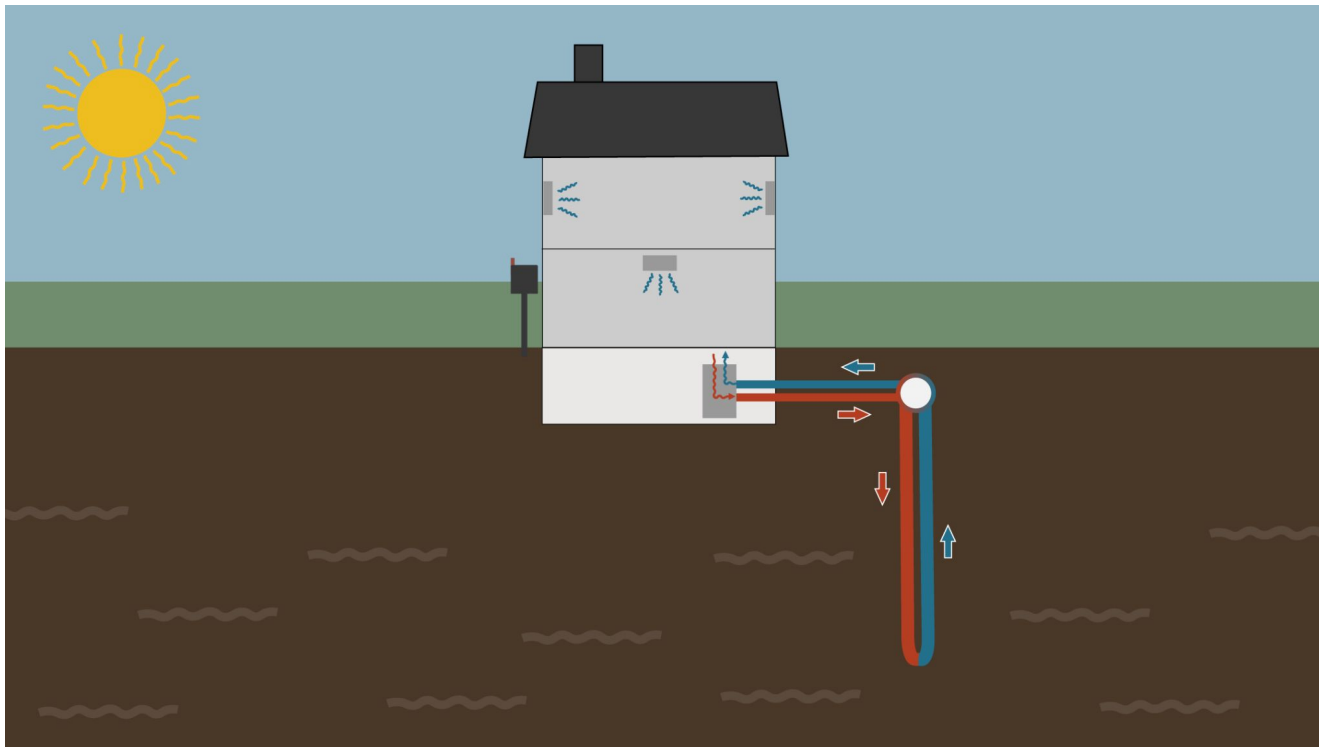
What about cooling?



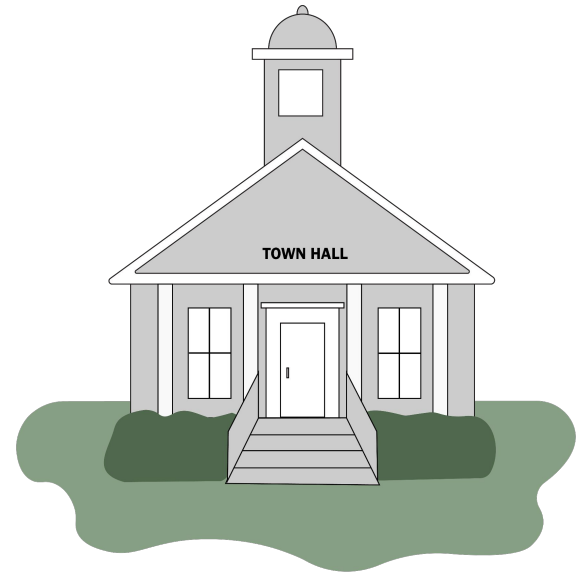
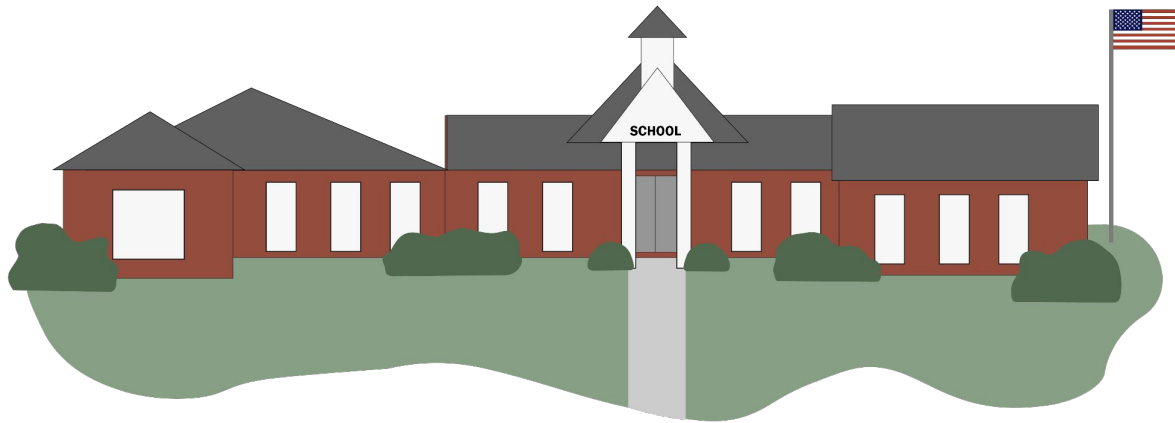
Ground Source Heat Pump



Ground Source Heat Pump



For a large building

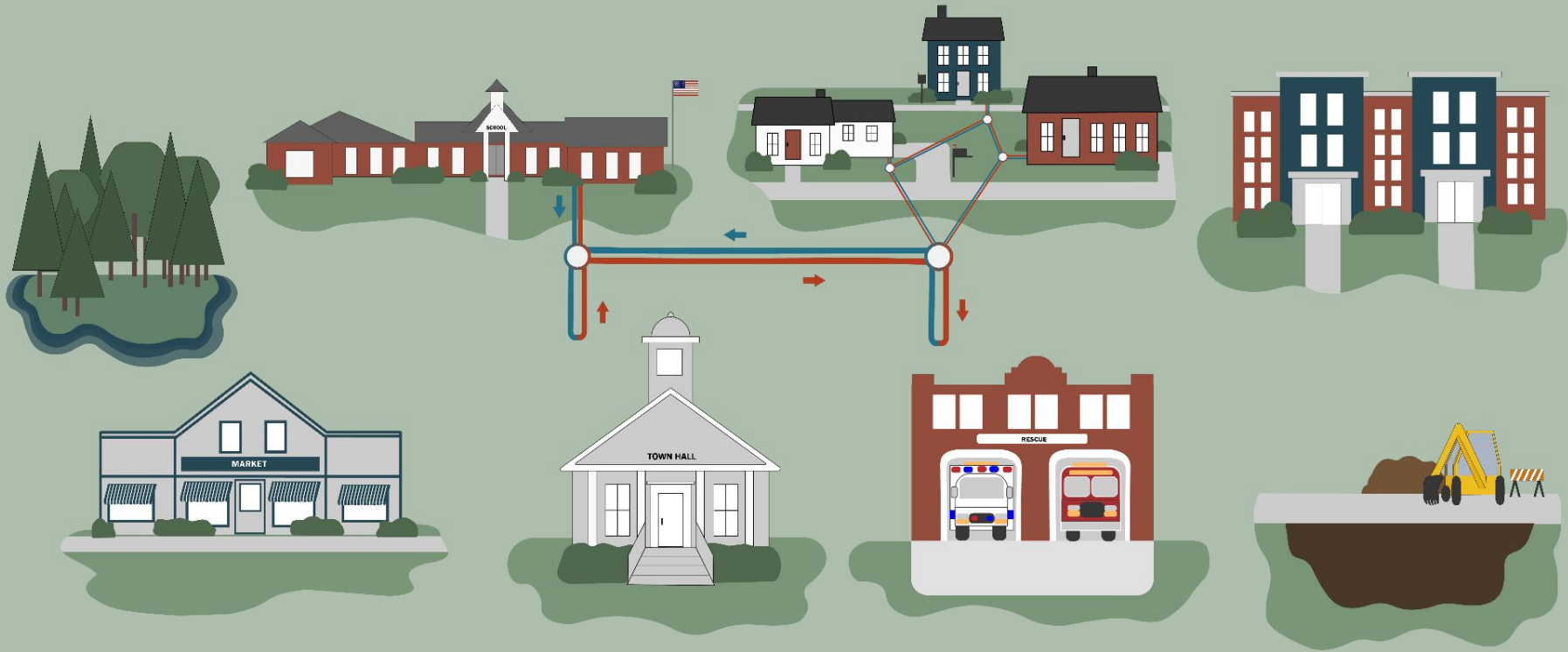


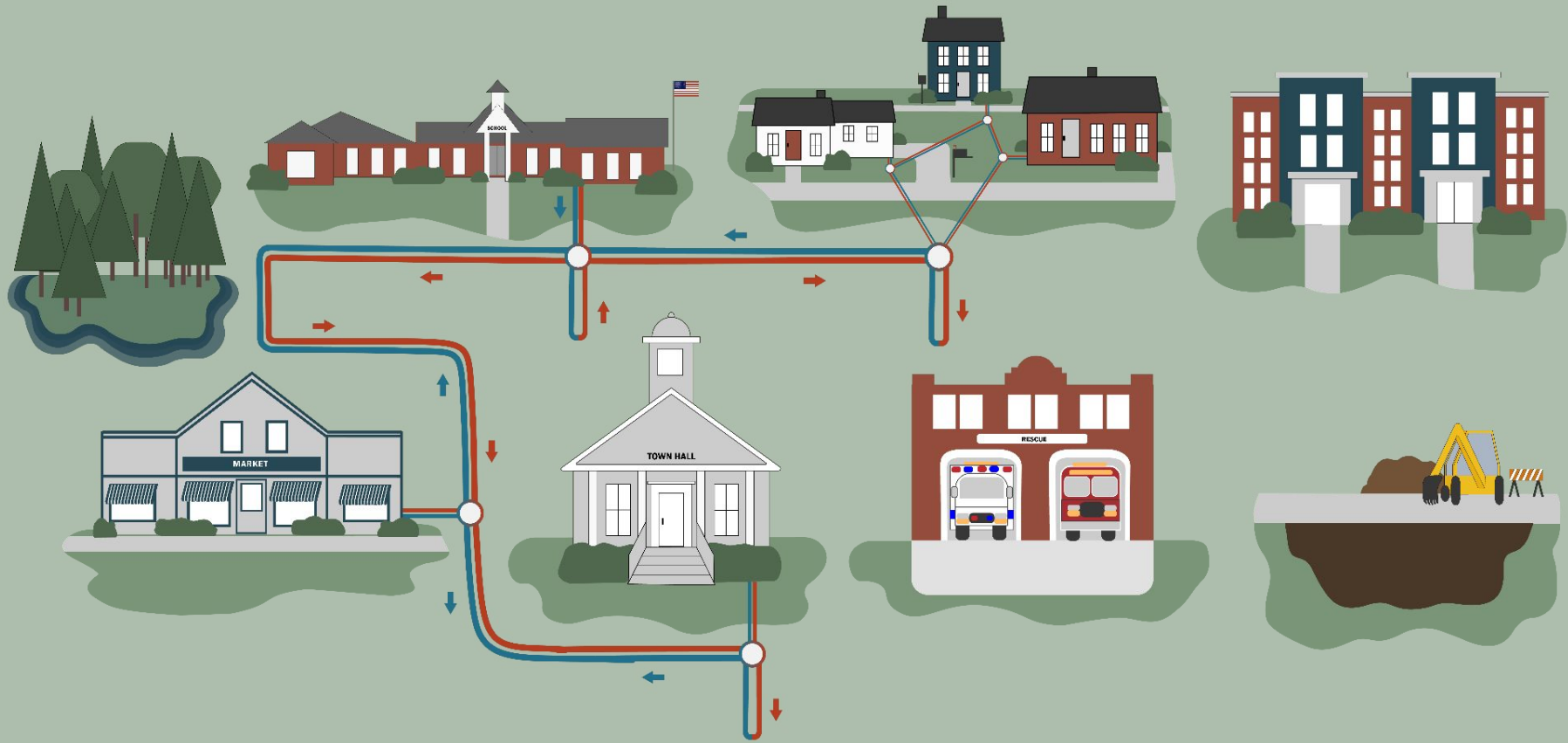
HEAT PUMPS

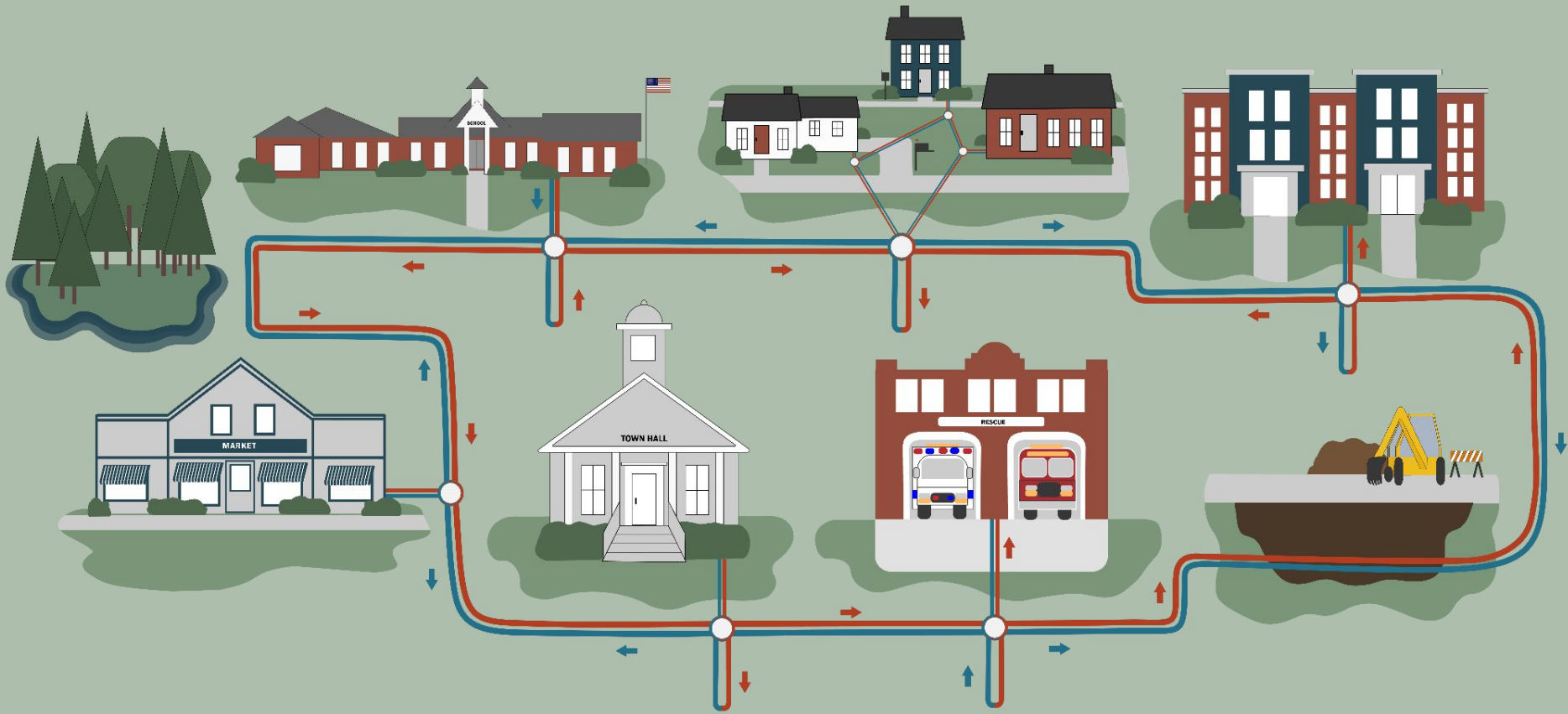


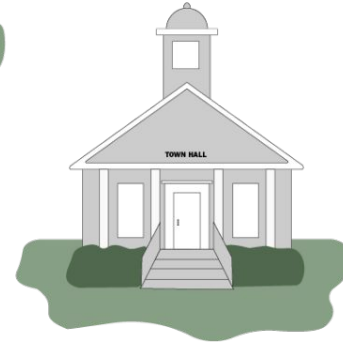
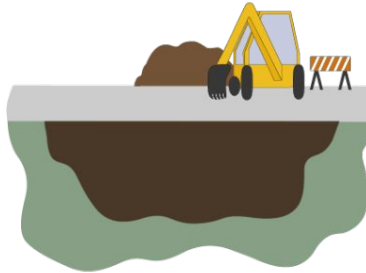
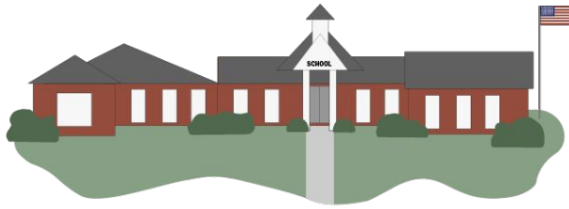
PIPES











Safe

Clean

Affordable

Reliable

Healthy

Flexible

Resilient

Secure

Equitable

Just

Local

Where are ground source heat pumps working in Vermont?

Installed:

- HULA Lakeside
- Champlain College campus
- St. Michael's College, Student Center and Residence Hall
- Winooski School District Elementary/High School
- Philo Ridge Farm
- VT National Guard – 3 at Camp Johnson Facility
- Middlebury College Environmental Center and South Street
- Proctor Academy Dining Hall
- St. Johnsbury Academy Green Dorm
- Burlington Barnes, CP Smith , and JJ Flynn Schools
- Department of Mental Health Residential Facility
- Billings Farm
- NRG Expansion Project
- Stowe Mountain Resort
- South Burlington City Hall
- New Haven Town Office

- PG Adams Truck Facility
- Woodstock Inn and Resort Bakery
- Fairbanks Museum
- Williston Public Safety
- Beta Technologies
- OnLogic
- Rutland Regional Medical Center

In process:

- Howard Center Burlington
- **Shelburne Farms Coach Barn**
- Echo Center Burlington
- Burlington High School/Technical Center
- SILT Bathhouse
- Old Bennington High School Redevelopment
- Putney Multi-Family Affordable Housing
- Hinesburg Affordable Housing

Champlain College

A ground source heat pump network can heat and cool both old and new buildings while keeping costs down.



Location: Burlington, VT

Size: 272,900 sq. ft.

Operating Since: 2008

Features:

- In Vermont
- Retrofit
- College Campus
- Phased Construction
- Open Loop

Green Streetscapes

Revitalization projects can attract new business and residents to rural towns by creating access to clean heating and cooling infrastructure.

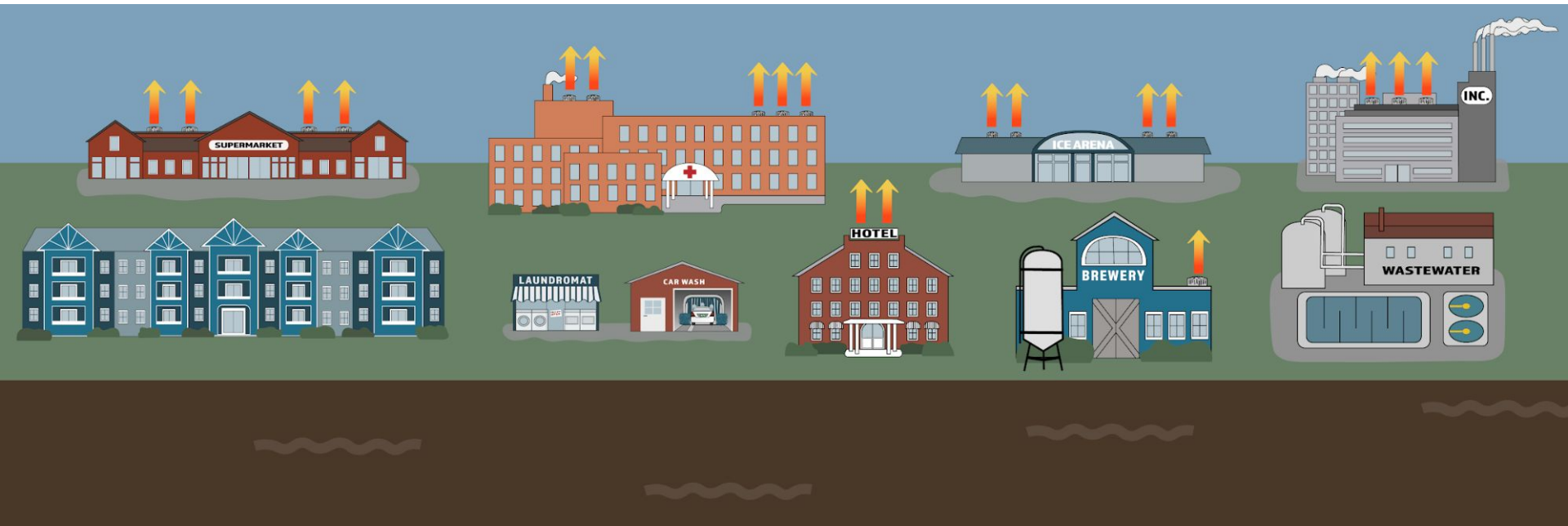


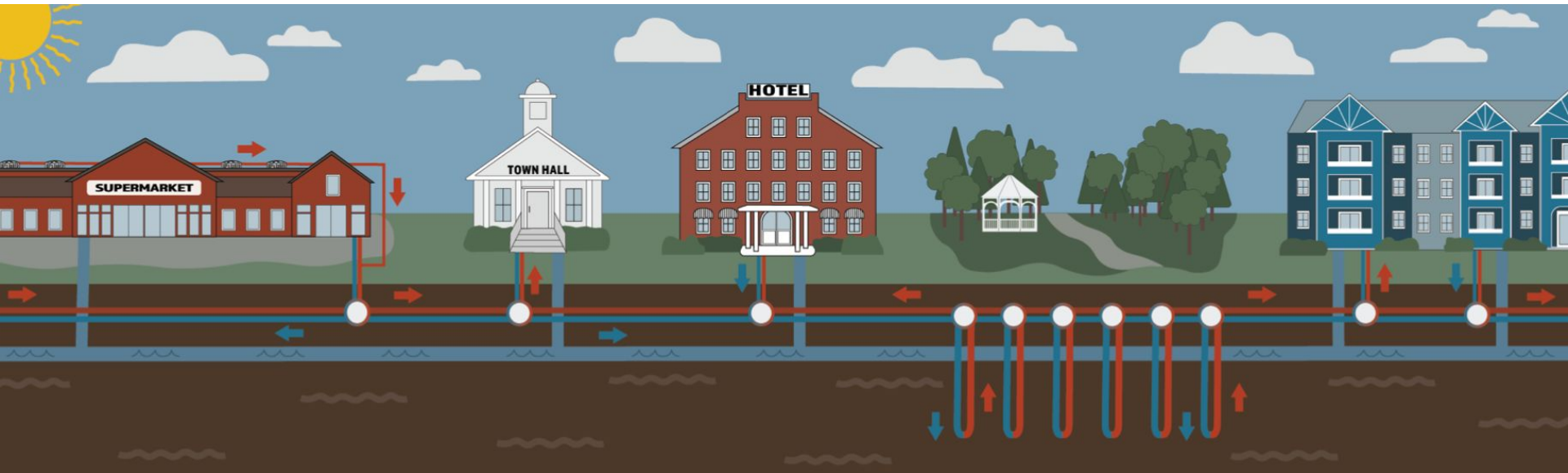
Location: West Union, IA
Size: 330,000 sq ft
Operating Since: 2012

Features:

- Rural Community
- Retrofit
- Revitalization Project
- Future Expansion
- Neighborhood Scale

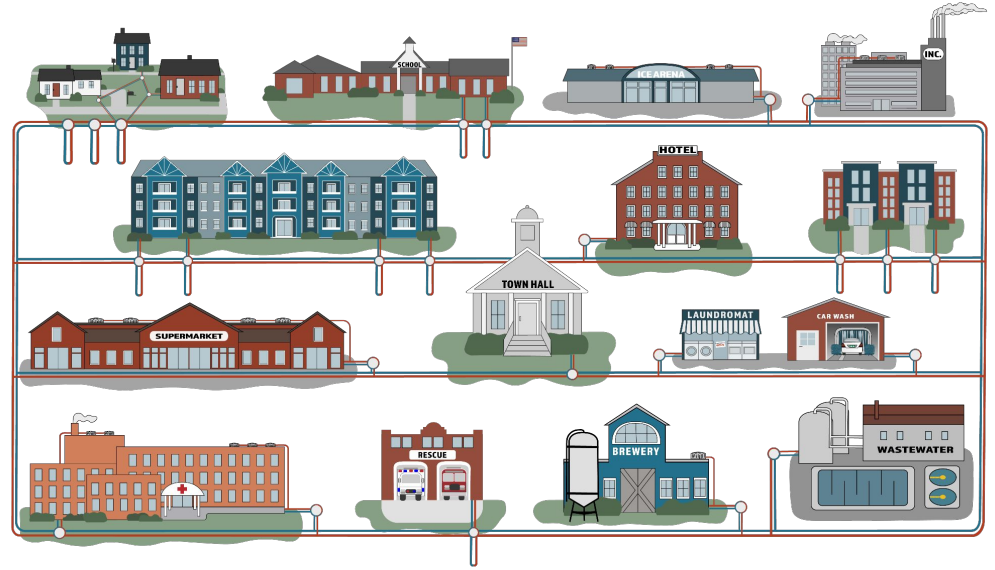


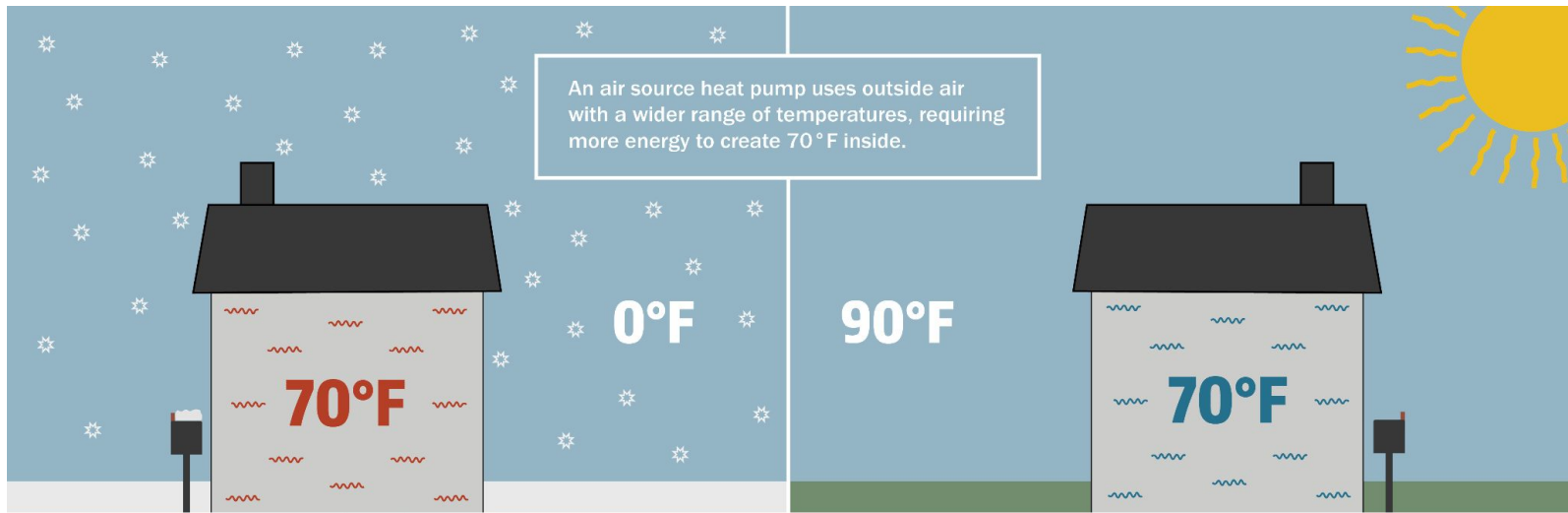




Thermal Energy Networks use heat that:

- Already exists across a community.
- Has already been paid for.
- Would otherwise be discarded.
- Can be used efficiently.





Thermal Energy Networks are a “*YES AND*” solution.

YES: Implement house-by-house solutions as quickly as possible



AND: Add community-scale solutions where most cost-effective



A high-angle photograph showing two workers installing a large, circular, black metal manhole cover. The cover has a grid of raised rectangular patterns. One worker, wearing blue jeans and a dark shirt, is on the left, and another worker, wearing orange high-visibility overalls and orange gloves, is on the right. They are both leaning over the cover, which is being set into a hole in a gravel surface. The background is filled with gravel and some construction equipment like a hammer and concrete blocks.

SHARED INFRASTRUCTURE

Water

Wastewater

Start small



Allow local control



Contribute to local goals





How to Develop a **Thermal Energy Network**

**A practical guide to adding
Thermal Energy Networks to
decarbonization plans for your community**



**START
HERE**



**IDENTIFY
OPPORTUNITIES**



**UNDERSTAND
OWNERSHIP**



**DEVELOP YOUR
PROJECT**

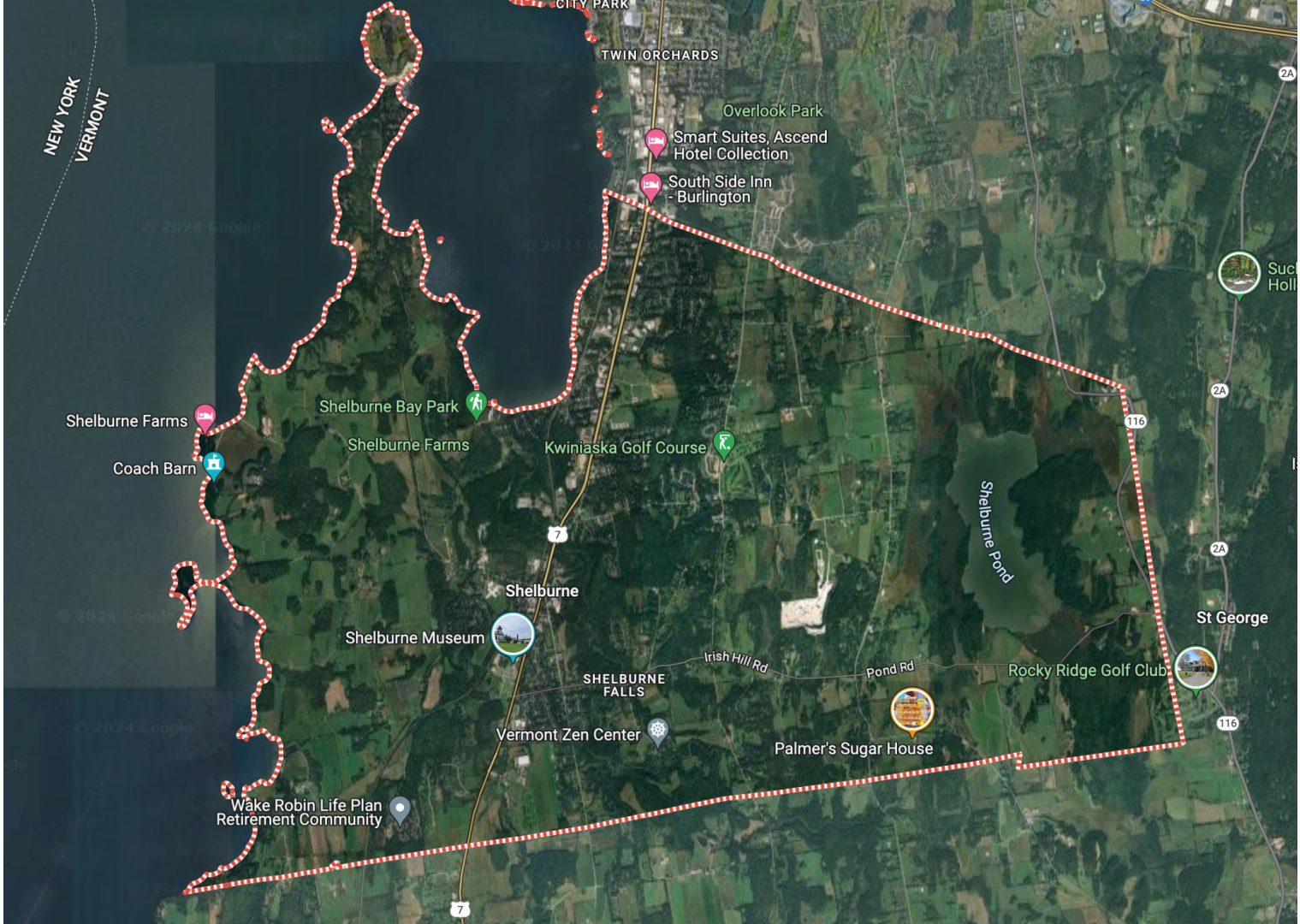


Thermal Energy Network Workshop Guide

Heat is a precious resource.

We have the heat we need . . . *and opportunities* to harness it.





NEW YORK
VERMONT

TWIN ORCHARDS

Overlook Park

Smart Suites, Ascend
Hotel Collection

South Side Inn
- Burlington

Shelburne Farms

Shelburne Bay Park

Shelburne Farms

Kwiniaska Golf Course

Coach Barn

Shelburne

Shelburne Museum

SHELBURNE
FALLS

Vermont Zen Center

Wake Robin Life Plan
Retirement Community

Irish Hill Rd

Pond Rd

Palmer's Sugar House

Shelburne Pond

Rocky Ridge Golf Club

St George

2A

116

2A

2A

116



Succotash
Hollow



Rocky Ridge Golf Club

7

7

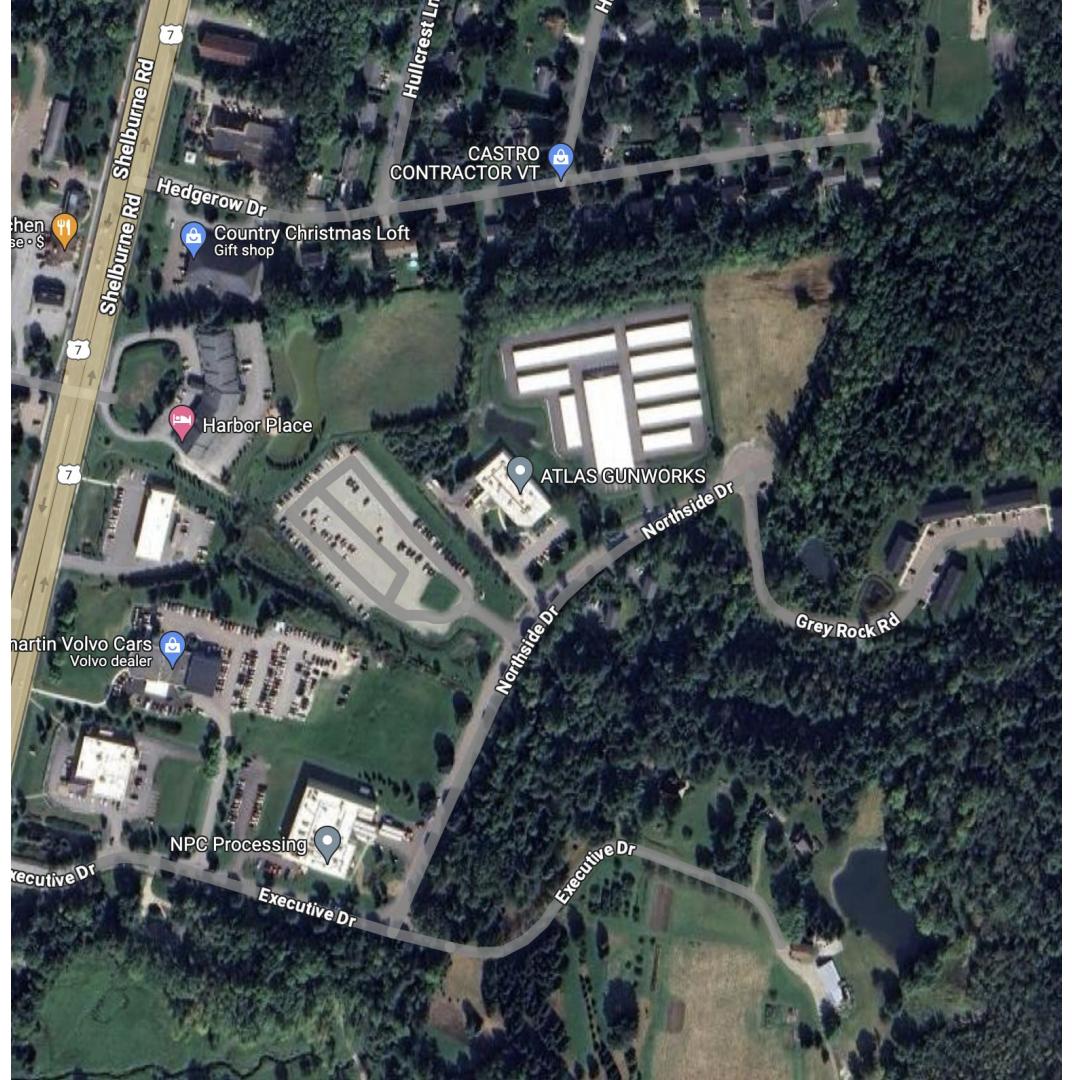
ATLAS Gunworks

NPC Processing

Kinney Drugs

Almartin Volvo

Harbor Place



Vermont Artisan Village

Folino's

Fiddlehead

Douglas Sweets

PajamaGram

Teddy Bear Factory



Rice Lumber

Harbour Industries

Burlington Marble & Granite

Athletic Club

Schools

Rescue/Town Garage

The Arbors

