

You Can't Get There From Here

The Influence of Topography on Vermont's First Roads

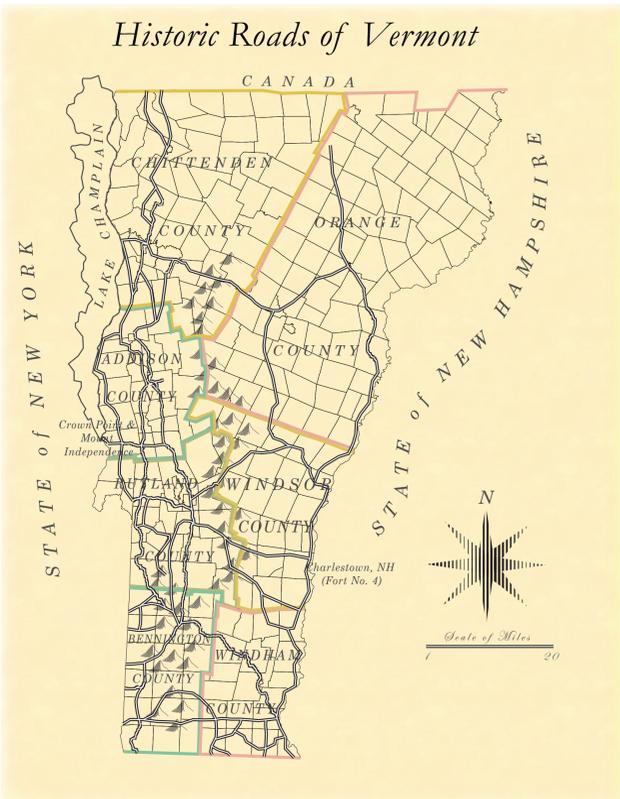
Hannah Orcutt - Historical Geology of Vermont - Professor Will Amidon - Winter Term 2012

Introduction



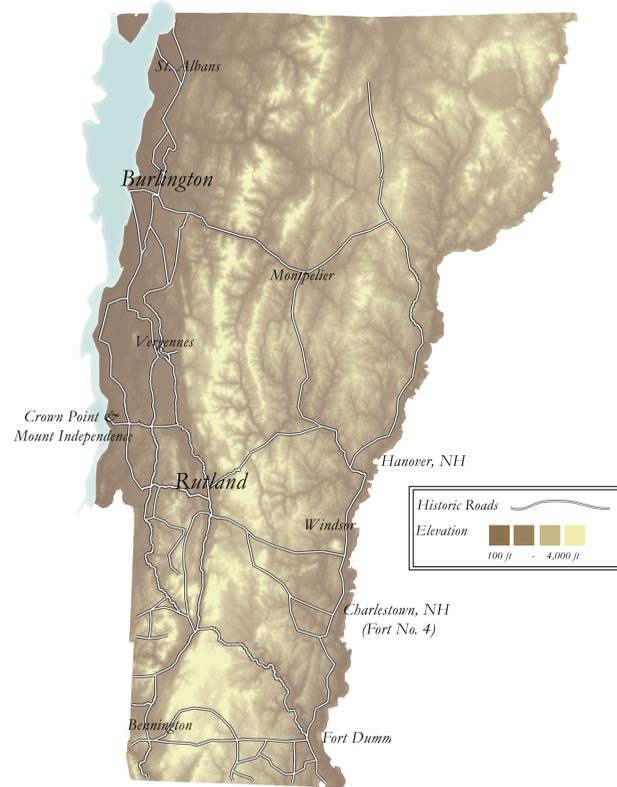
Since explorers and settlers first traversed their way into Vermont, roads have been vital to the state's success with military campaigns, industrial undertakings, and development of towns and population centers. Natives built transportation corridors through the dense wilderness that covered the state at the time, evidenced by an old Indian Road following Lake Champlain from Canada to the Connecticut River (Smith & Mason, 1886). In addition, the Allen brothers cut paths through the state while surveying the land in the 1750s and 60s, but neither these, nor the Indian paths, were established as true roads (Wheeler & Wheeler, 1968). The first recorded roads were military roads built by the British and French during the French and Indian war of the 1760s. The first roads crossed the mountains at a strategic geologic and topographic point, indicating the importance of the underlying land in dictating road location. Topography, influenced by tectonic activity and weathering processes, and underlying bedrock geology posed significant challenges to road construction, influencing the location of early roads in Vermont. The following geologic and geography study explores Vermont's old adage "you can't get there from here!"

Vermont's Early Roads



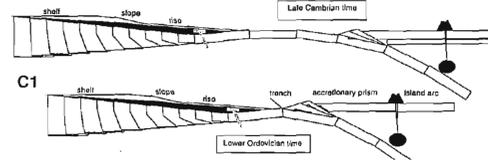
The military roads leading to and from Crown Point, Fort Ticonderoga, and Mount Independence, formed the first transportation network in Vermont. After these military roads, settlers began building more established routes through the state, connecting population centers north and south in the valleys and east and west across the state. Maps from the early 1800s show the approximate locations of these roads. These earliest road maps show roads in roughly the same locations as current state throughways Route 7, Route 30, Route 2 and Highways 89 and 91 (Carey, 1814). Most of the roads run through the Champlain Valley and Valley of Vermont, on the west of the state. This area is not only the flattest, most habitable part of the state in terms of topography, it was also heavily used during military occupations during the French and Indian Wars, Revolutionary War, and War of 1812. (Hill, 1995). The small number of roads running east-west through the state is that the Green and Taconic Mountains posed a major hurdle to road construction.

Topography



Most of the early roads in Vermont follow low-lying north-south corridors through the state, with a few roads crossing the mountains in strategic gaps or passes. Early maps show many more roads crossing the state from east to west in the Taconic mountains, with only one road, in the location of current highway 89, crossing further north in the Greens. The main north-south corridors are the Champlain Valley, Connecticut River Valley, and the Valley of Vermont in the southwest of the state. These valleys and mountains reflect ancient tectonic processes, the collision and separation of lithospheric plates that formed the topography of the state.

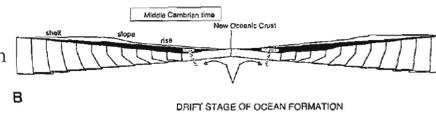
This basin eventually closed due to subducting oceanic crust (Figure C1), resulting in a collision of the North American plate with an island arc roughly 450-440 million years ago. When this arc, and the sediments built up during subduction, collided with the North American plate, the Taconic mountains were formed in the south of the state.



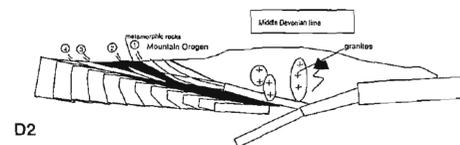
altered significantly by glaciers and weathering, the current topography of Vermont, and its geologic composition, reflects these historic tectonic processes with a ridge of mountains down the spine of the state and "faults", or valleys, on either side. The Taconic mountains, about a million years older than the younger Appalachian (Green) Mountains in the north of the state, reflect a completely different tectonic collision. Their shape and size is therefore different than the mountains in the north, making them easier to cross and inhabit. The state's valleys, namely the Connecticut River Valley and the Valley of Vermont, provide perfect lowlands to build roads running north-south through the state.

Tectonic Setting

The Taconic and Acadian Orogeny, the events that formed the most of New England's mountains, are responsible for much of the modern day topography of Vermont. Parts of the Wilson Cycle, which involves a spreading center, subducting trench, and continental collision, these events followed the creation of the Iapetus ocean basin approximately 550 million years ago (Figure B).



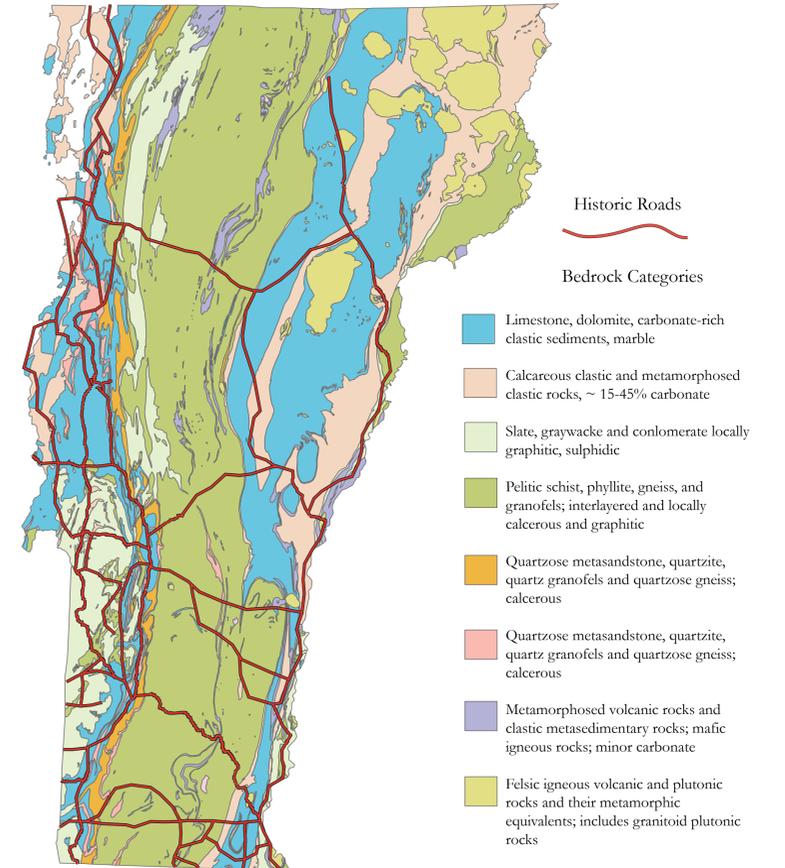
A second stage of the Wilson cycle led to another basin, subduction, and collision process known as the Acadian Orogeny, which created the Appalachian mountains and formed New England as a complete land mass about 400-350 million years ago (Doolan, 1996). Though



Bedrock

A closer look at the rocks underlying Vermont gives more insight into the weathering and erosion of topological features. The rocks that make up the valleys of Vermont, namely limestones, sandstones, and other sedimentary rocks, are more prone to physical weathering and erosion than the harder igneous rocks (phyllites, gneiss, and schist) of the Green and Taconic mountains. The map of Vermont's bedrock geology shows the spine of hard, igneous rock running down the length of the state and the sedimentary deposits on either side. Already low points after the Taconic and Acadian orogenies, these valleys were made deeper by processes of water, wind, and ice. The combination of these factors has created the topography of Vermont today, and influence why historic roads were mostly located in the low-lying valleys running north-south through the state.

Historic Roads of Vermont and the Underlying Bedrock Geology



Conclusion

Especially early on in Vermont's history, topography dictated the location of the roads in the state. Looking at a modern road map of Vermont, is it evident that some of the same topological constraints still influence road building. Roads still follow the gaps in the mountains, taking advantage of the existing topography. Passes such as the Appalachian Gap, Lincoln Gap, and Middlebury Gap provide routes through the mountains, but remain highly weather dependent and receive limited maintenance. Major corridors such as Highway 89, 91, Route 7, and Route 30 remain key transportation routes through the state. Despite technological and mechanical achievements in road construction, it appears that tectonic processes that occurred millions of years ago still influence the building of roads in Vermont.