

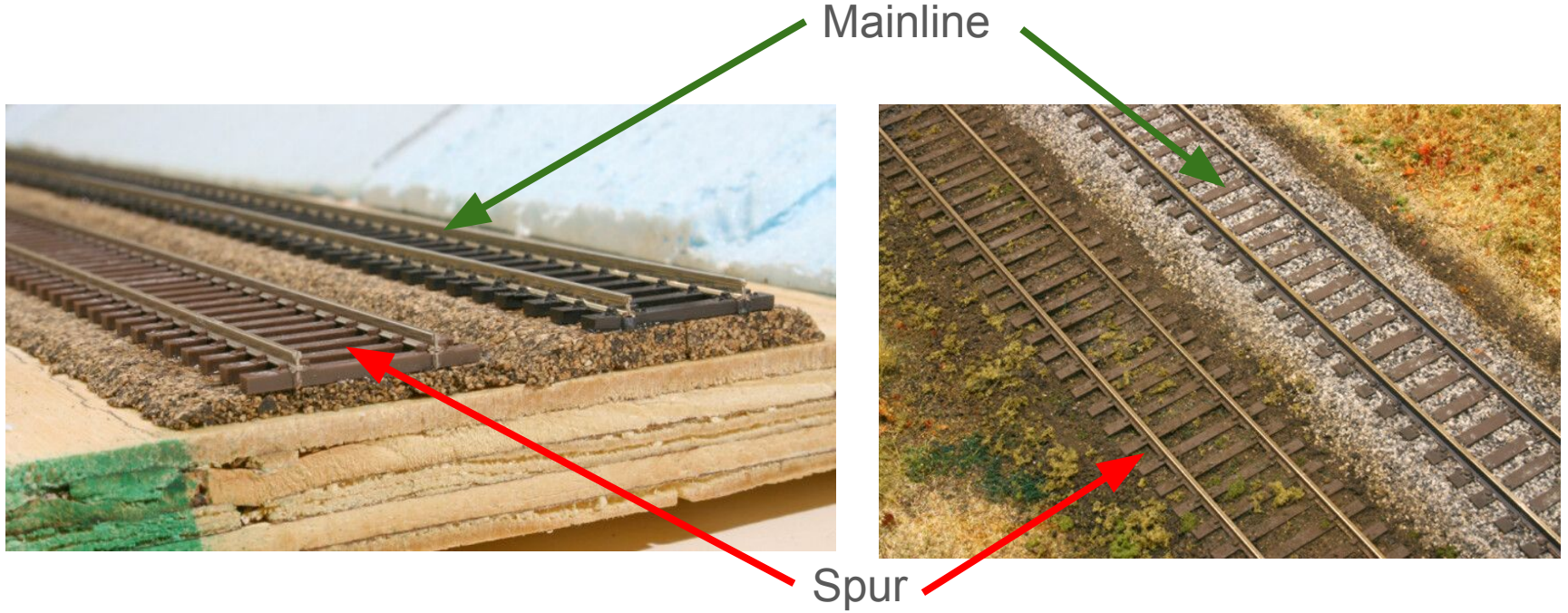
Beebe Spur History

Terry Lucas

Spur

- Lighter track to serve companies access to mainline
- Look less engineered - lack of high speed ballast
- Often narrower in appearance vegetation closer to the track
- Tighter turns than high-speed mainlines to navigate complex industrial areas
- Located in hilly terrain in limited space requiring less clearing than mainline
- One track 4' 8.5" wide

Spur versus Mainline



VT Rail Trails

- **Beebe Spur (BSRT)**
 - **3.8 miles long 7' wide 1-2' shoulders quickly tappers to sloping terrain**
 - Central Vermont Railway CT & Passumpsic railroad used limestone, grain, lumber, & tourists
- Lamoille Valley (LVRT)
 - **94 miles long 14 feet wide (10' & 2' shoulders)**
 - St. Johnsbury to Swanton mainline 30% inbound commodities outbound 20% dairy products
- Missisquoi (MVRT)
 - **26 miles long 14 feet wide (10' & 2' shoulders)**
 - Central Vermont Railway CT to Canada mainline
- Delaware & Hudson (DHRT)
 - **20 miles long 8-10 feet wide gentle rolling shoulders**
 - Class 1 mainline PA to Canada

Spur connection

- Today Spur Stops at Prouty Drive
- Spur connection to Columbia Forestry and VT Maple Products tracks remain
- No longer connects to downtown Newport

Topography of the Spur

- Shoulders narrow and quickly slopes to the terrain 1-2' wide

Westside Spur (Lakeside)

- Lake Memphremagog with 10-30' precipices 45°-90°
- Water edge has lots of granite blocks to support the shoreline

Eastside Spur

- 5-10 feet drops into wetlands, ponds
- 10-20 feet drops into valleys

VAST Best Practices Manual

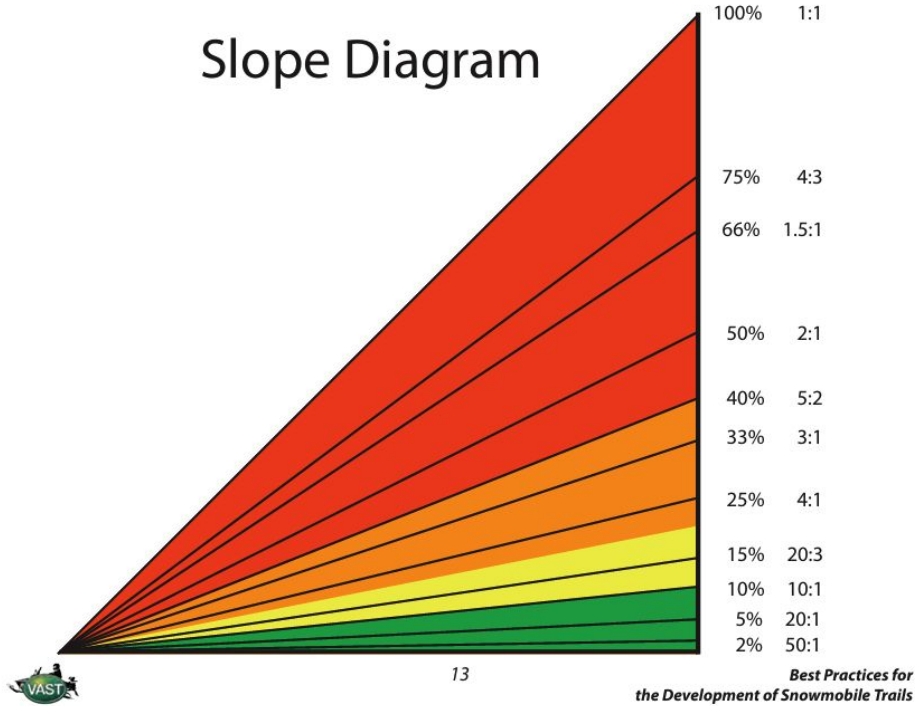
**Best Practices for
The Development of
Snowmobile Trails**



Steep slope trails need more width in curves to increase sight distance

VAST

Slope Diagram



Red Area grade > 50% equivalent to a 37° Slope
Spur Banks > 40°

Westside (Lakeside) of Spur





10 feet drop



10-15 feet drop 40-45° Slope



25-30 feet drop



30 feet drop



10-15 feet drop 40-45° Slope



15 feet drop 40-45° Slope



Large Boulders



Eastside of Spur



10-15 feet 40-45° Slope



20 feet drop 45° Slope



Eastside Wetlands



10 feet drops into Wetland pond



7' path into 8' wide trestle

Sharp turns



Turns into 20-30 feet drop

Rails-To-Trails Conservancy (RTC)

Recommends 10 feet width for multi-use trails

Association of State Highway and Transportation Officials' (AASHTO's) design guidelines as the standard for multi-use trail widths. AASHTO recommends a minimum of 10 feet for multi-use trails; however, where heavy use is anticipated, a 12- to 14-foot width is recommended.

Belmont Spur in New Hampshire Rail Trail Coalition

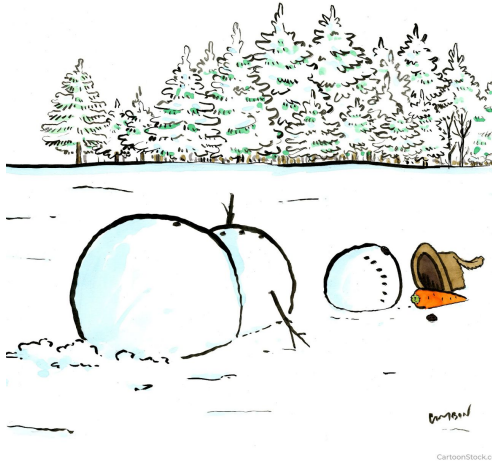


- Prohibits snowmobiles on its eastern section due to a narrow covered bridge. Favoring non-motorized users walking, snowshoeing, and cross-country skiing.
- 8' wide covered bridge is deemed **too narrow.**

Safety

$$E_k = \frac{1}{2}mv^2$$

Kinetic Energy mass velocity



Kinetic Energy and Blunt Trauma to Humans

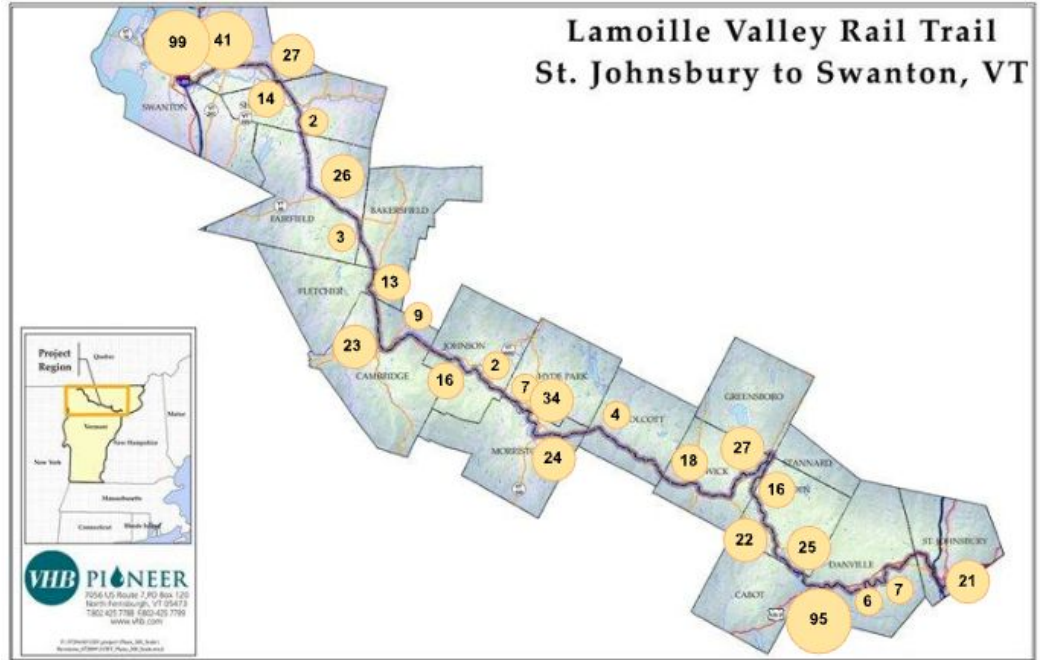
Gross Mass	Speed	Energy in Joules	Human Injury
725 pounds	20 MPH	13,143 Joules	Dangerous amounts of energy immediate medical attention substantial potential for harm.
725 pounds	30 MPH	29,574 Joules	Extensive skeletal shattering, internal organ rupture, and massive soft tissue destruction.
725 pounds	40 MPH	52,575 Joules	Total structural failure of the human skeletal system and massive internal hemorrhaging.
800 pounds	20 MPH	14,503 Joules	Dangerous amounts of energy immediate medical attention substantial potential for harm.
800 pounds	30 MPH	32,633 Joules	Extensive skeletal shattering, internal organ rupture, and massive soft tissue destruction.
800 pounds	40 MPH	58,014 Joules	Total structural failure of the human skeletal system and massive internal hemorrhaging.

205 Homeowners on the Spur



123 homes adjacent to the spur
 82 homes within 1000 feet of spur
 Spur Density of 51.25 homes per mile.

595 Homeowners on LVRT (94 miles long)



531 homes adjacent to the trail
 64 homes within 1000 feet of LVRT
 LVRT Density of 6.33 homes per mile

Road Less Traveled



Rail-Trails are like three paved mainline roads and one dirt road (cart path)