

Vermont





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Vermont

- Discovered in 1535 by Jacques Cartier, Vermont became the 14th State in 1791
- In 1777 Vermont adopted its first constitution, abolishing slavery and providing for universal male suffrage without property qualifications, for a short time – a country
- With a land area of 9248 square miles, VT ranks 43rd
- With 626,930 people VT ranks 49th, but has the highest ratio of dairy cows to people in the country, still
- Vermont contains more than 15,000 different insect species
- Highest Point: Mt. Mansfield; 4,393 feet, Lowest Point: Lake Champlain; 95 feet, the downhill slope has a limit...



On the Road to Performance





On the road... reclaimed base

- The Plan
 - Convene stakeholders
 - Confirm the issues
 - Highlight possible changes
 - Coalesce engineers on high priority change
 - Finalize VTrans “blue line” specification
 - Stakeholder “red line”
 - Test specification
 - Measure performance

On the road....





On the road...

- Convene stakeholders ✓
- Confirm the issues ✓
- Highlight possible changes ✓
- Coalesce engineers on high priority change ✓
- Finalize VTrans “blue line” specification
- Stakeholder “red line”
- Test specification and modify further
- Measure Performance



On the road...





On the road...

- Initially, a VTrans had a mixed specification with both prescriptive and weak performance components and limited acceptance criteria
- Risk assignment
- Execution
- Enforceability
- Practicality
- Certainty of success



On the road...

- Original spec defined site investigation, design method, compaction requirement and no finished product standard for the contractor
- You get what you get...
- Poor performance in some cases
- Public outcry at rapid worsening...
- Suspension of use for technology in VT

On the road...



On the road...



On the road...

Variability in RSB

Coefficient of Variation of the Testing Equipment

Test	Day	Min	Avg	Max
NDG, Moisture	Day 0	7.3	10.8	15.1
NDG, Compaction	Day 0	1.5	3.6	13.5
Clegg Impact Values	Day 1	19.3	22.8	26.7
	Day 7	13.4	18.1	23.4
LWD, Moduli	Day 1	42.0	64.8	88.7
	Day 7	43.2	59.5	97.7
FWD, Moduli	Day 1	40.4	62.7	87.7
	Day 7	30.7	52.6	81.2
Core Strengths	Day 7	21.8	53.5	154.6

On the road...



On the road ...who, what

- Geotechnical
 - Materials
 - Designer
 - Inspector
 - Industry
 - Contractors
- To build a consistent, reliable road with adequate capacity

On the road

- Performance parameters – capacity, uniformity, durability, safety and comfort
- Evolutionary process change
 - revised design method
 - transferred design to VTrans
 - established field feedback technique
 - prescriptive equipment stds for moisture control

On the road...

- Contractor control of construction still opportunity area
- Changes
 - Incentive/disincentive pay system being evaluated future deployment with transfer of control (QC responsibility increase)
 - 3 day QC data supplied to contractor
 - Revised supplemental materials w/design accommodation

On the road...changes

- Reexamine density targets and frequency
- Address moisture relationships
- Devise rapid, conditional acceptance indices for performance criteria
- Training across the board - design, construction and inspection

Off the road





On the road...seeking input

- How far, how fast...
- Independent layer reactions
- Revised design objectives – wearing, binder and base course response
- Durability performance measures
 - Accelerated tests
 - Indirect indices – cure strain measurement
 - By layer

On the road... again



