Alternative Pavement for Shared Use Paths

George Batchelor, Supervisor of Landscape Design
MassHighway
Why Alternative Pavement?

• “Softer” surface
• Environmentally friendly
• Aesthetics (‘natural’)

Guidance

- Accessibility Law
  - 521 CMR and ADAAG
- MassHighway Project Development & Design Guide
521 CMR (State) & ADAAG (Federal)

- Firm, stable, and slip resistant
- Smooth (1/4” max deviation)
“Hard, all-weather pavement surfaces are usually preferred over those of crushed aggregate, sand, clay, or stabilized earth.”

“Operating agencies that have chosen crushed aggregate as their surface material have found they can achieve a completed path in less time and for less expense than with asphalt or concrete.”
AASHTO Guide

• “Operating agencies have found that skaters were not drawn to the crushed aggregate path, and that bicyclists speeds were slower”

• “Areas subject to frequent or even occasional flooding or drainage problems, or in areas of steep terrain, unpaved surfaces will often erode and are not recommended”
“Hard, all-weather pavement surfaces are usually preferred over those of crushed aggregate, sand, clay, or stabilized earth.”

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MassHighway Guide

- Firm, stable, slip resistant
- Without slopes and cross-slopes greater than that allowed by AAB.
- “This can be a difficult standard to meet”
- Without level changes greater than $\frac{1}{4}$
- Without low-hanging branches or obstacles protruding between 27-80 inches
MassHighway Guide

• “Some surface treatments may be appropriate to introduce a particular theme or certain aesthetic quality”

• Must be maintained and repaired, per requirements of AAB and ADAAG
MassHighway Guide

• “521 CMR, The Rules and Regulations of the Massachusetts Architectural Access Board, applies to any pathway constructed for pedestrian use.”
521 CMR – The Regs

521 CMR: ARCHITECTURAL ACCESS BOARD

22.00: WALKWAYS

22.5 SURFACE

*Walkway* surfaces shall be stable, and firm and shall lie generally in a continuous plane with a minimum of surface warping.

22.6 DRAINAGE

Grading and drainage shall be designed to minimize pooling of water or accumulation of ice or flow of water across *walkways*.
“In most cases a 4-inch bituminous concrete riding surface placed over 8-12 inch aggregate base is recommended”
Example Projects
Pavement Types

- Crushed Aggregate (stone dust)
- Organically Stabilized
- Cement Concrete Stabilized
- Chip-seal
Example Projects

• Carlisle – Walking Path (stone dust)
• Plymouth – Seaside Trail
• Canton – Recreation Park
• DCR – Upper Charles Path
• NPS – Minuteman National Park
Measures of Success

• Construction Issues
  – Ease of construction
  – Affordability

• Performance (Does it work?)
  – Engineering Standards
  – Aesthetics

• Maintenance
  – Does it last?
  – How easy to fix?
Stone Dust Path
Carlisle

Completed: 2004
Photo: September 2006
Stone Dust Path
Carlisle
Completed: 2004
Photo: September 2006
Measures of Success
Carlisle

• Construction Issues
  – Ease of construction
  – Affordability

• Performance
  – Engineering Standards
  – Aesthetics

• Maintenance
  – Does it last?
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Stabilization
Soil Stabilization Index System

PERFORM SIEVE ANALYSIS TESTS

PERFORM ATTERBERG LIMIT TEST

< 25 % PASS 0.075 mm

PI < 10

CEMENT STABILIZATION

BITUMINOUS STABILIZATION
additional requirement for base courses PI < 6 and PI of minus 0.075 mm material < 72

PI > 10

CEMENT STABILIZATION

LIME STABILIZATION

> 25 % PASS 0.075 mm

PI < 10

CEMENT STABILIZATION

LIME STABILIZATION

10 < PI < 30

add sufficient time to reduce PI < 10 (subgrade) PI< 6 (base course)

CEMENT STABILIZATION

BITUMINOUS STABILIZATION

PI > 30

add sufficient time to reduce PI < 30

CEMENT STABILIZATION

LIME STABILIZATION
Soil Stabilization
Alternative Stabilizer Products

• Stabilizer
• Dirtglue
• Road Oyl
• MountainGrout
Plymouth Seaside Rail Trail
Cross Section

- Grassed Shoulders
- Weed Control Fabric
- Stabilized Fine Aggregate (Stone Dust)
- 100mm Depth Typical
- 200mm Compacted Gravel Borrow Base
- Undisturbed or Compacted Subgrade
Plymouth Seaside Trail

Completed: Spring 2005
Photo: October 2006
Plymouth Seaside Trail

Completed: Spring 2005
Photo: October 2006
Measures of Success
Plymouth Seaside Rail Trail

• Construction Issues
  – Ease of construction
  – Affordability

• Performance
  – Engineering Standards
  – Aesthetics

• Maintenance
  – Does it last?
  – How easy to fix?