Small Paving
Bike Paths & Parking Lots

Mike Skinner, PE
Director of Pavement Engineering
Why Asphalt?

- Lower initial construction costs
- Lower maintenance costs
- Ease of maintenance
- Increased snow melt
Vehicle Load Factors

1 18,000 lb. axle (truck) = 1929 cars
1 bus = 2642 cars

Colorado Asphalt Pavement Association
Pavement Design

Asphalt

18 kip

\( \varepsilon_t \)

Tensile Strain at the bottom of first layer
Superpave Asphalt Binder Specification
Grading System Based on Climate

PG 76-28

Performance Grade
Average 7-day max pavement design temp
Min pavement design temp
64 °C
- 22 °C
# Asphalt Binder

<table>
<thead>
<tr>
<th>PG ASPHALT BINDER</th>
<th>SUGGESTED USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PG 58-34*</td>
<td>Modified asphalt, very low temp. climates, low volume roadways</td>
</tr>
<tr>
<td><strong>PG 58-28</strong></td>
<td>Unmodified, low volume roadways</td>
</tr>
<tr>
<td>PG 64-22</td>
<td>Unmodified, most commonly used PG grade, for low, moderate and high volume roadways</td>
</tr>
<tr>
<td>PG 64-28*</td>
<td>Modified asphalt, Moderate to high volume roadways, colder climates</td>
</tr>
<tr>
<td>PG 70-28*, PG 76-28*</td>
<td>Modified asphalts, very high volume roadway</td>
</tr>
</tbody>
</table>
# Mix Gyrations

<table>
<thead>
<tr>
<th>SUPERPAVE GYRATION LEVEL</th>
<th>SUGGESTED USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Very low volume pavements – trails, parking lots, minor residential streets</td>
</tr>
<tr>
<td>75</td>
<td>Predominate gyration level, minor and major residential, minor and major collectors, minor and major arterials, highways</td>
</tr>
<tr>
<td>100</td>
<td>Very high volume, heavy truck intersections, heavy truck major arterials, high volume interstate highways</td>
</tr>
</tbody>
</table>
# Aggregate Size

<table>
<thead>
<tr>
<th>SUPERPAVE AGGREGATE GRADATION*</th>
<th>MINIMUM LIFT THICKNESS</th>
<th>SUGGESTED USE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST (3/8″)</td>
<td>1″</td>
<td>Preventive Maintenance thin lift overlays, surface mixes</td>
</tr>
<tr>
<td><strong>SX (1/2″)</strong></td>
<td>1½″</td>
<td>Surface mixes, some intermediate mixes</td>
</tr>
<tr>
<td>S (3/4″)</td>
<td>2¾″</td>
<td>Bottom, intermediate and some surface mixes</td>
</tr>
<tr>
<td>SG (1″)</td>
<td>3″</td>
<td>Bottom mats for multi lift paving</td>
</tr>
</tbody>
</table>
58,308 sqft → 6,479 sqyd
Parking Lot Asset Value

$453,530

Maintenance Budget 3%

$13,605

Maintenance Budget 1%

$4,535

Maintenance Budget ½ %

$2,268
Colorado Trails & Paths

- Technical Resource
- Keys to Quality
- Design/Construction
- Maintenance
- User Preference
- Cost Comparisons

Fraser Trail
How Not to Design a Bike Path
The Use of Hot Mix Asphalt for Colorado Trails and Paths

TECHNICAL RESOURCES:
3rd Edition, Fall 2005
The Use of Hot Mix Asphalt for Colorado Trails & Paths

- The Performance Challenge
  - Extend performance life
  - Reduce maintenance costs
The Use of Hot Mix Asphalt for Colorado Trails & Paths

◊ The Performance Challenge

- Weed growth
- Shoulder failure
- Other issues: subgrade failure, tree roots, raveling
The Use of Hot Mix Asphalt for Colorado Trails & Paths

KEY TO PERFORMANCE

“Proper design and construction together with the proper thickness and proper base preparation will help ensure a high quality hot mix asphalt trail or path.”
The Use of Hot Mix Asphalt for Colorado Trails & Paths

- Design/Construction

“The performance of a paved trail depends on……

A) the material requirements specified

B) the quality of construction of the contractor and…..”
The Use of Hot Mix Asphalt for Colorado Trails & Paths

Design/Construction

“The performance of a paved trail also depends on…….

C) the structural design of the pavement

and the

D) investment level of the project

Vail Pass Trail
The Use of Hot Mix Asphalt for Colorado Trails & Paths

PERFORMANCE CHALLENGE

“In the past, it was not uncommon for 2” asphalt trails to be constructed on compacted native soil.”

CAUTION: The performance of a 2” asphalt trail constructed on native soil should not be compared directly with a 6” concrete pavement constructed on 6” of aggregate base.
The Use of Hot Mix Asphalt for Colorado Trails & Paths

• Design and Construction Tips

• Use the AASHTO design requirements for pavement and shoulders. (allow for drainage)

• “Rich” mixes provide excellent durability and allow for ease of construction and improved surface texture.

• Always use a weed sterilant!!
The Use of Hot Mix Asphalt for Colorado Trails & Paths

- Design and Construction Tips
  - Asphalt pavement thickness minimum of 3”
  - Aggregate base course thickness minimum of 6”
  - Adequate subgrade preparation and requirements
The Use of Hot Mix Asphalt for Colorado Trails & Paths

• Design and Construction Tips
  • Paving Seams (Construction Joints)
  • Compaction
  • Inspector’s Role
  • Subgrade Preparation

“The primary role of the inspector is to ensure that the plans and specifications are being followed.”
The Use of Hot Mix Asphalt for Colorado Trails & Paths

User Preference - The Asphalt Advantage

- continuous, joint free surface
- soft, flexible pavement
- ease of repair
- lower construction cost
Summit County Paved Recreational Pathways System

Legend
Recreational Pathways:
- Snake River Recpath
- Tonkille Recpath / Vail Pass
- Lower Blue Recpath
- Dillon Reservoir Recpath
- Upper Blue Recpath
- Other Paved Recpaths
- On-Street Bike Lane

Other Features:
- Private Lands
- Towns
- USFS Lands

55 miles of bike paths
May – October

200,000 riders

Keep paths open during maintenance & Rehabilitation
More $ / SY for bike path system than the County’s Road Network
Full Depth Reclamation or Asphalt Overlay
Thank You

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