

Small Paving Bike Paths & Parking Lots



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Director of Pavement Engineering



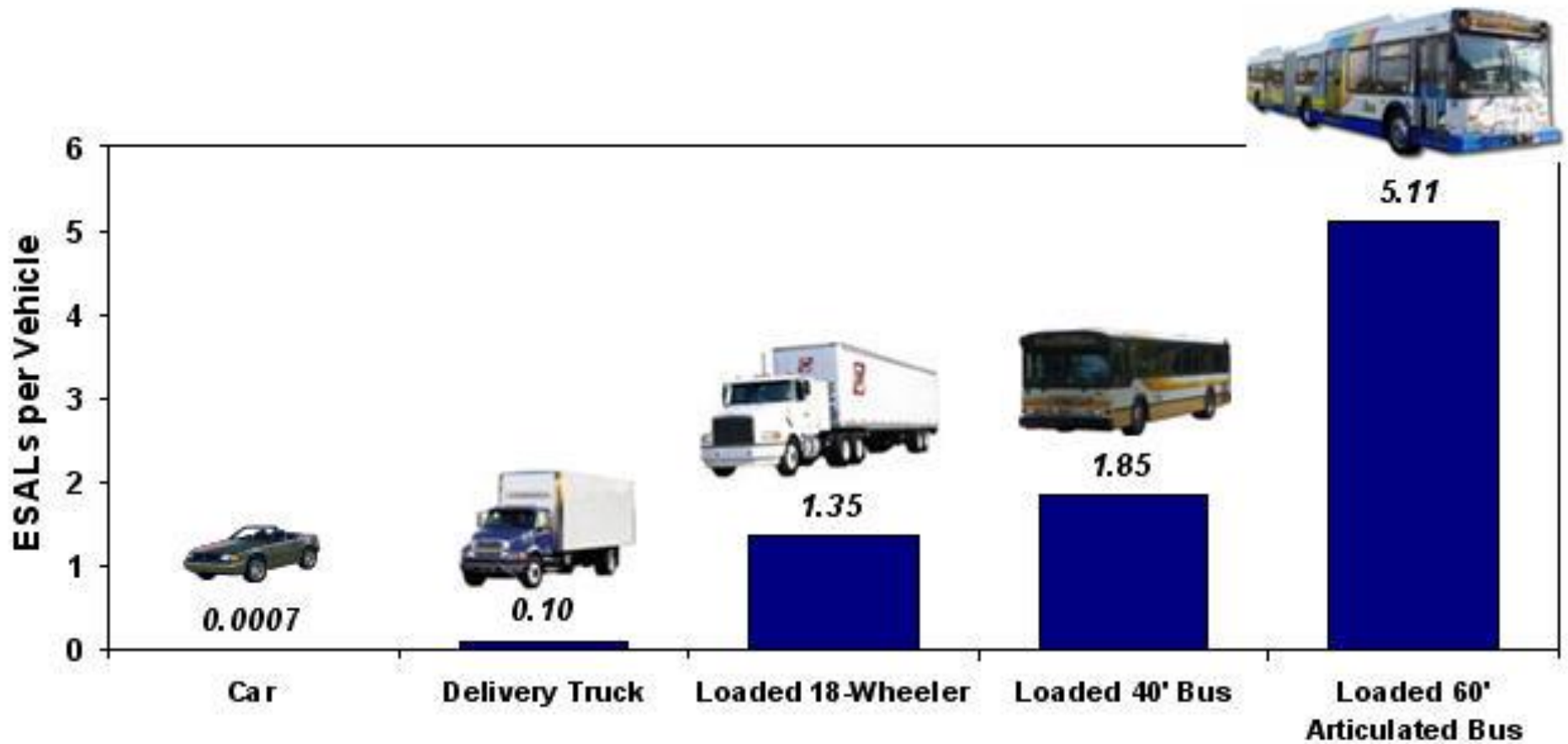


Why Asphalt?



- Lower initial construction costs
- Lower maintenance costs
- Ease of maintenance
- Increased snow melt

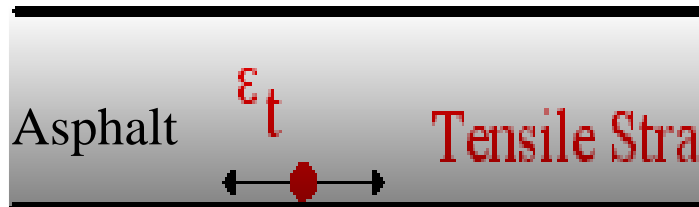
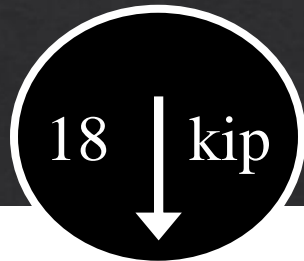
Vehicle Load Factors



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

1 bus = **2642 cars**

Pavement Design



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
64 °C**

**Min pavement
design temp
- 22 °C**



Asphalt Binder

PG ASPHALT BINDER	SUGGESTED USE
PG 58-34*	Modified asphalt, very low temp. climates, low volume roadways
PG 58-28	Unmodified, low volume roadways
PG 64-22	Unmodified, most commonly used PG grade, for low, moderate and high volume roadways
PG 64-28*	Modified asphalt, Moderate to high volume roadways, colder climates
PG 70-28*, PG 76-28*	Modified asphalts, very high volume roadway

Mix Gyration

SUPERPAVE GYRATION LEVEL	SUGGESTED USE
50	Very low volume pavements – trails, parking lots, minor residential streets
75	Predominate gyration level, minor and major residential, minor and major collectors, minor and major arterials, highways
100	Very high volume, heavy truck intersections, heavy truck major arterials, high volume interstate highways

Aggregate Size

SUPERPAVE AGGREGATE GRADATION*	MINIMUM LIFT THICKNESS	SUGGESTED USE
ST (3/8")	1"	Preventive Maintenance thin lift overlays, surface mixes
SX (1/2")	1½"	Surface mixes, some intermediate mixes
S (3/4")	2¼"	Bottom, intermediate and some surface mixes
SG (1")	3"	Bottom mats for multi lift paving



**A GUIDELINE FOR THE DESIGN AND
CONSTRUCTION OF ASPHALT PARKING
LOTS IN COLORADO**



1st Edition
January 2006

2nd Edition
December 2016

- Project Planning
- Design Considerations
- Thickness Design**
- Planned Staged Construction
- Materials & Mix Design**
- Selecting the Right Mix
- Construction Recommendations
- Asphalt curbs
- Porous Asphalt**



58,308 sqft → 6,479 sqyd



Property Info

Parcel Area: 0.00 sq ft Show Parcel

Parcel Perimeter: 0.00 ft

Groups: **All**

Measurements Counts Labels

Area: **123,464.31 sq ft** Perimeter: **6,447.67 ft**

Linear Distance: **318.86 ft**

[Clear All](#) | [Hide All](#) | [Show Labels](#)

Road into Property - Area Add - Asphalt

Area: 13,497.04 sq ft

Perimeter: 980.08 ft 20%

abc Visible

Soccer Field Lot - Area Add - Asphalt

Area: 9,642.69 sq ft

Perimeter: 607.31 ft 20%

abc Visible

Employee Parking - Area Add - Asphalt

Area: 10,606.40 sq ft

Perimeter: 435.12 ft 20%

abc Visible

Playground - Area Add - Asphalt

Area: 6,029.45 sq ft

Perimeter: 321.21 ft 20%

abc Visible

Four Square Games - Area Add - Asphalt

Area: 2,857.16 sq ft

Perimeter: 375.87 ft 20%



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



Reddit/mike_pant

The Use of Hot Mix Asphalt for Colorado Trails and Paths

TECHNICAL RESOURCES:

“A Guideline for the Design and Construction of Asphalt Pavements for Colorado Trails and Paths”

3rd Edition, Fall 2005



The Use of Hot Mix Asphalt for Colorado Trails & Paths

◆ The Performance Challenge

- ◆ Extend performance life
- ◆ Reduce maintenance costs



Fraser Trail

The Use of Hot Mix Asphalt for Colorado Trails & Paths

◆ The Performance Challenge



Weed growth

Shoulder failure

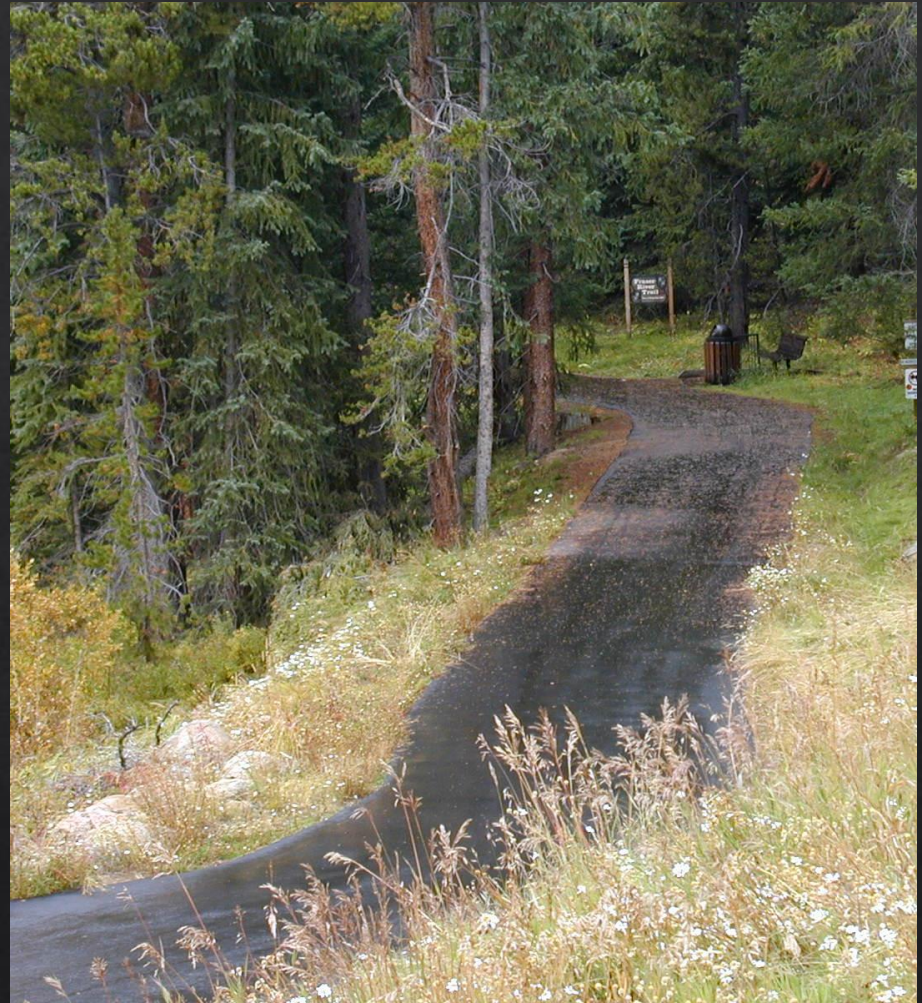


**Other issues:
subgrade failure
tree roots, raveling**

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

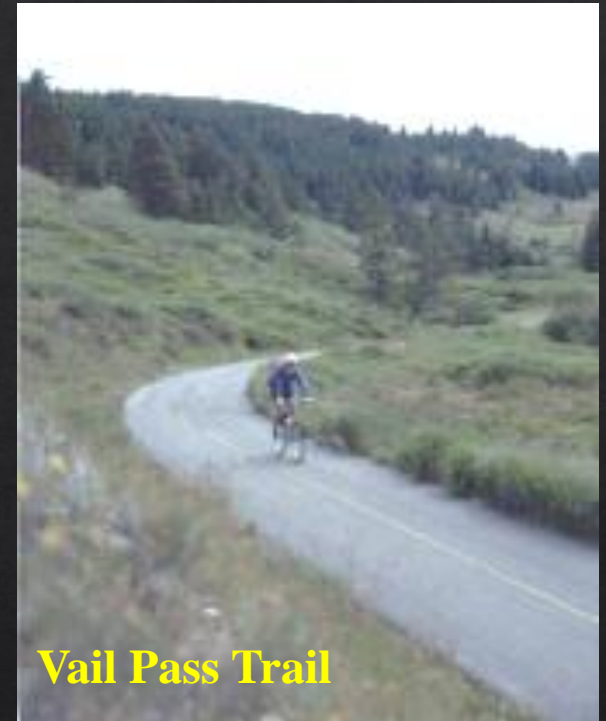
■ Design/Construction

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

C) the structural design of the pavement

and the

D) investment level of the project



The Use of Hot Mix Asphalt for Colorado Trails & Paths

PERFORMANCE CHALLENGE

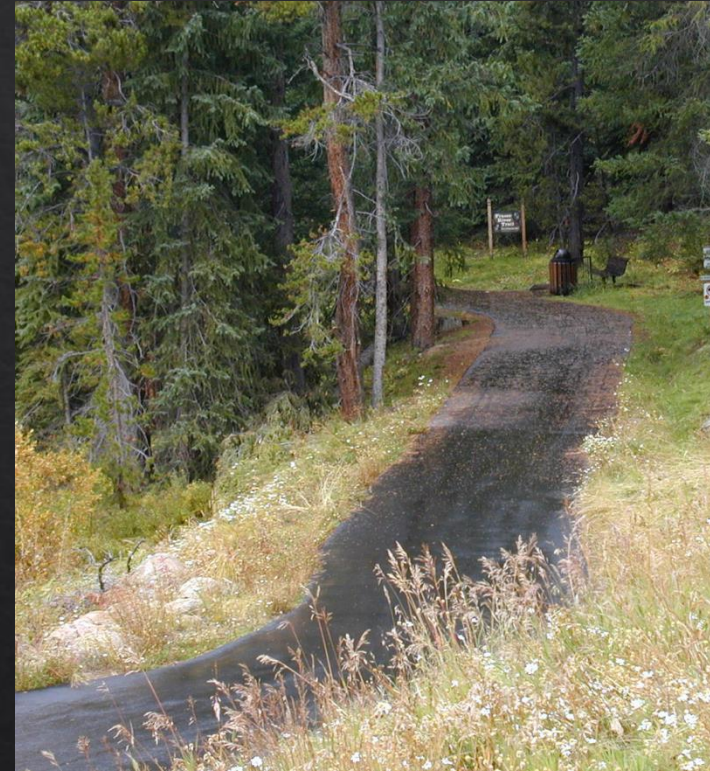
“In the past, it was not uncommon for 2” asphalt trails to be constructed on compacted native soil.”

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

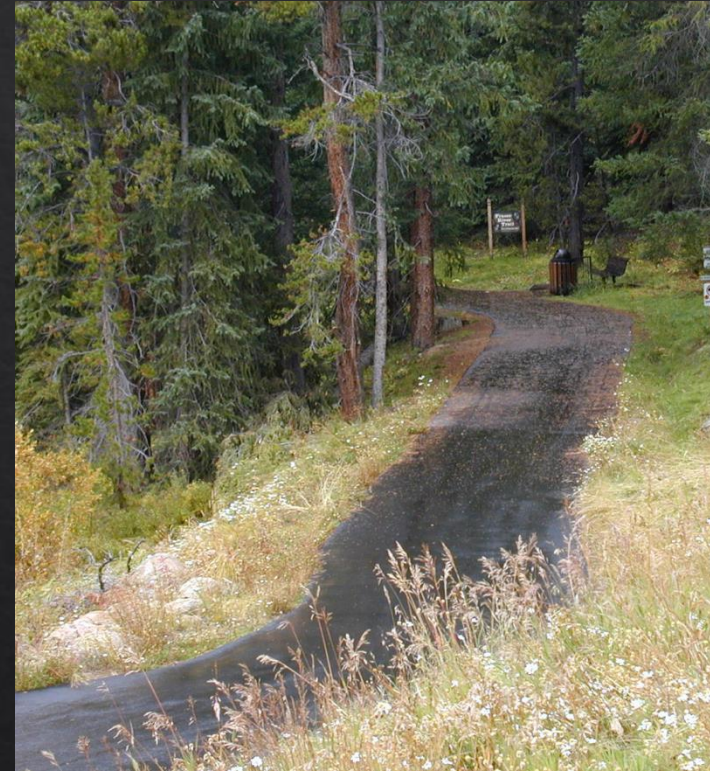
- Design and Construction Tips
 - Asphalt pavement thickness minimum of 3”
 - Aggregate base course thickness minimum of 6”
 - Adequate subgrade preparation and requirements



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

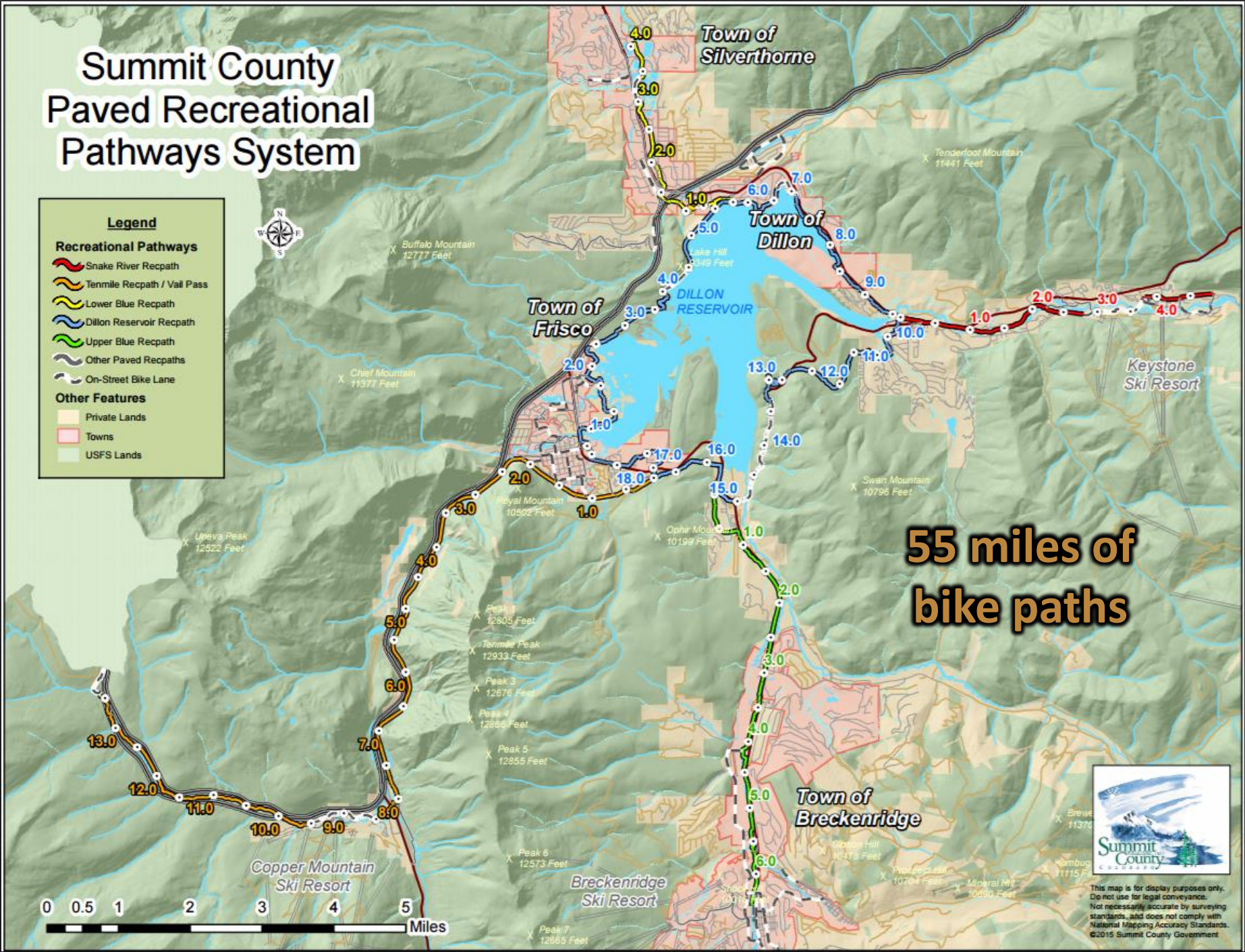
Legend

Recreational Pathways

- Snake River Recpath
- Tenmile 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**



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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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