

Foamed Asphalt Seminar 2007

Presented By : Nixon-Egli Equipment
Wirtgen America
Western Stabilization



Candidate Roadways

- **Wheel Path Base Failures**
- **Pot Holes**
- **Alligator Cracking**
- **Transverse Cracking**
- **Thermal Cracking**
- **Longitudinal Cracking**

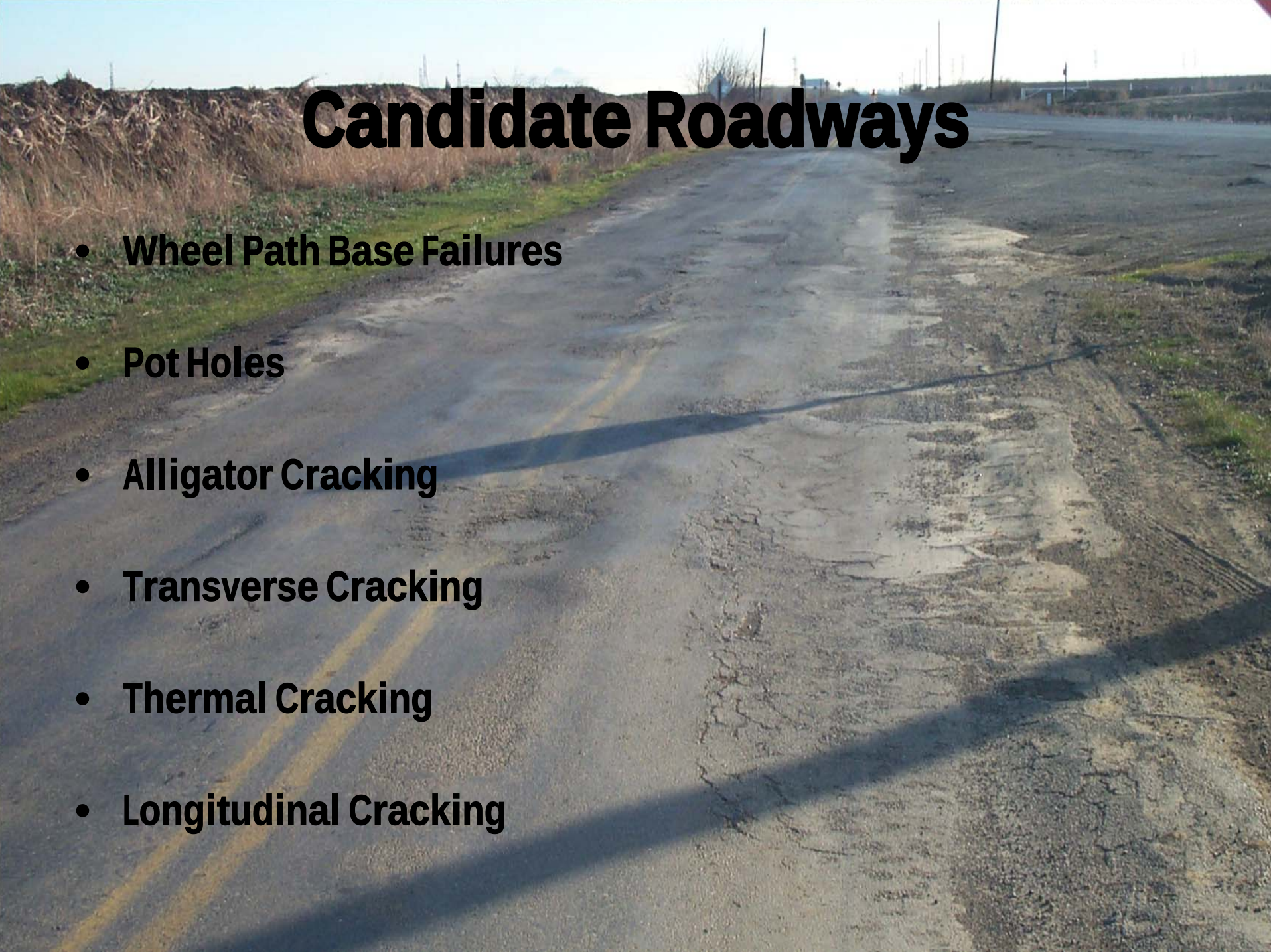




Candidate Roadways

- **Wheel Path Base Failures**
- **Pot Holes**
- **Alligator Cracking**
- **Transverse Cracking**
- **Thermal Cracking**
- **Longitudinal Cracking**

Candidate Roadways

The background image shows a two-lane asphalt road in a rural or undeveloped area. The road surface is in poor condition, with several large potholes, deep longitudinal cracks, and areas where the asphalt has worn away, exposing the underlying base. The road is flanked by dry, brown grass and some sparse green vegetation. In the distance, there are some utility poles and a clear sky.

- **Wheel Path Base Failures**
- **Pot Holes**
- **Alligator Cracking**
- **Transverse Cracking**
- **Thermal Cracking**
- **Longitudinal Cracking**

Why Foamed Asphalt Recycling

- Recycling
- Public Impact
- Construction Benefits
- \$\$\$\$\$\$\$



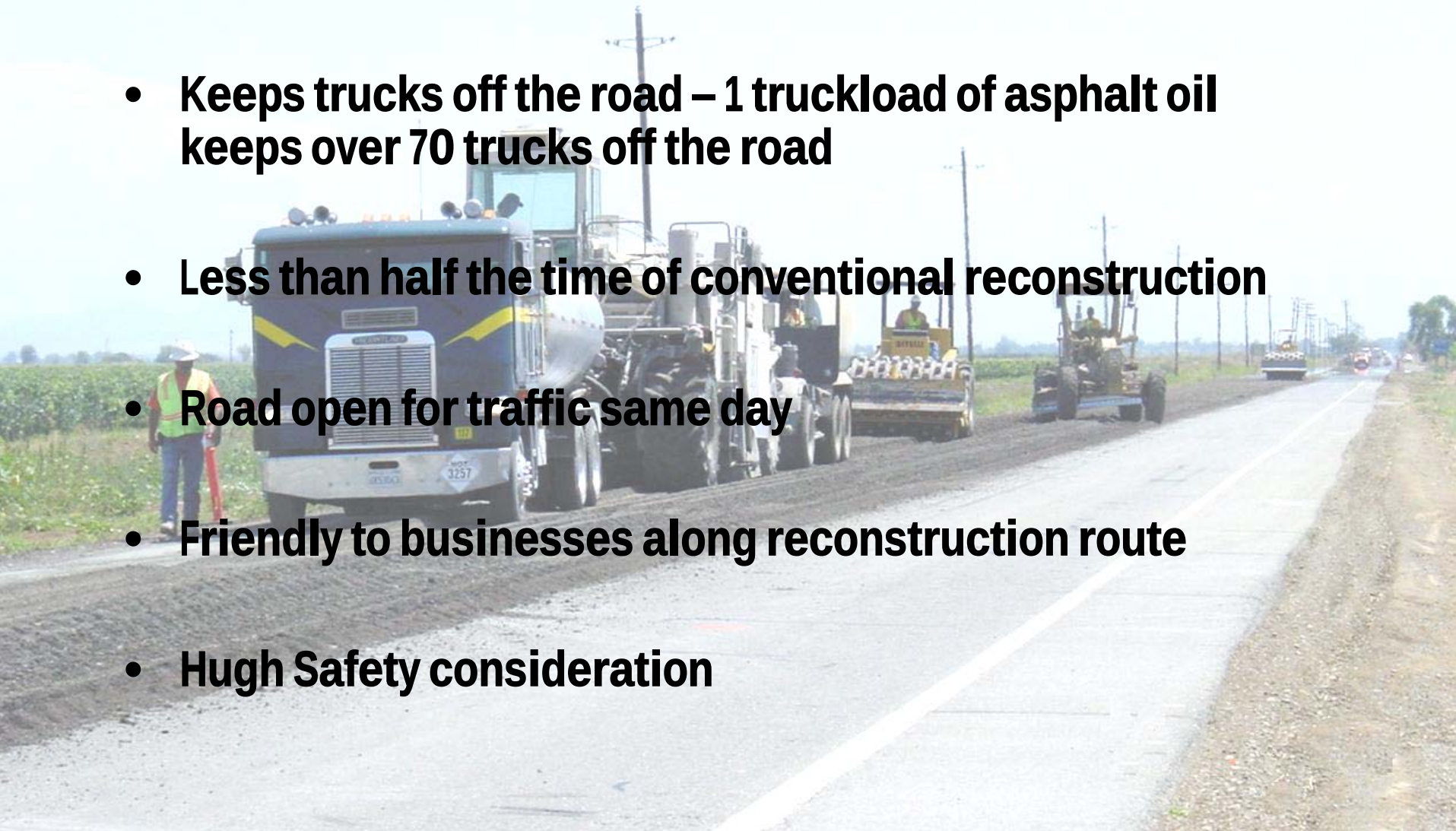
Recycling

- Up to 100% of existing materials reused
- Limited need of New Materials
- Keeps reusable materials out of the landfill



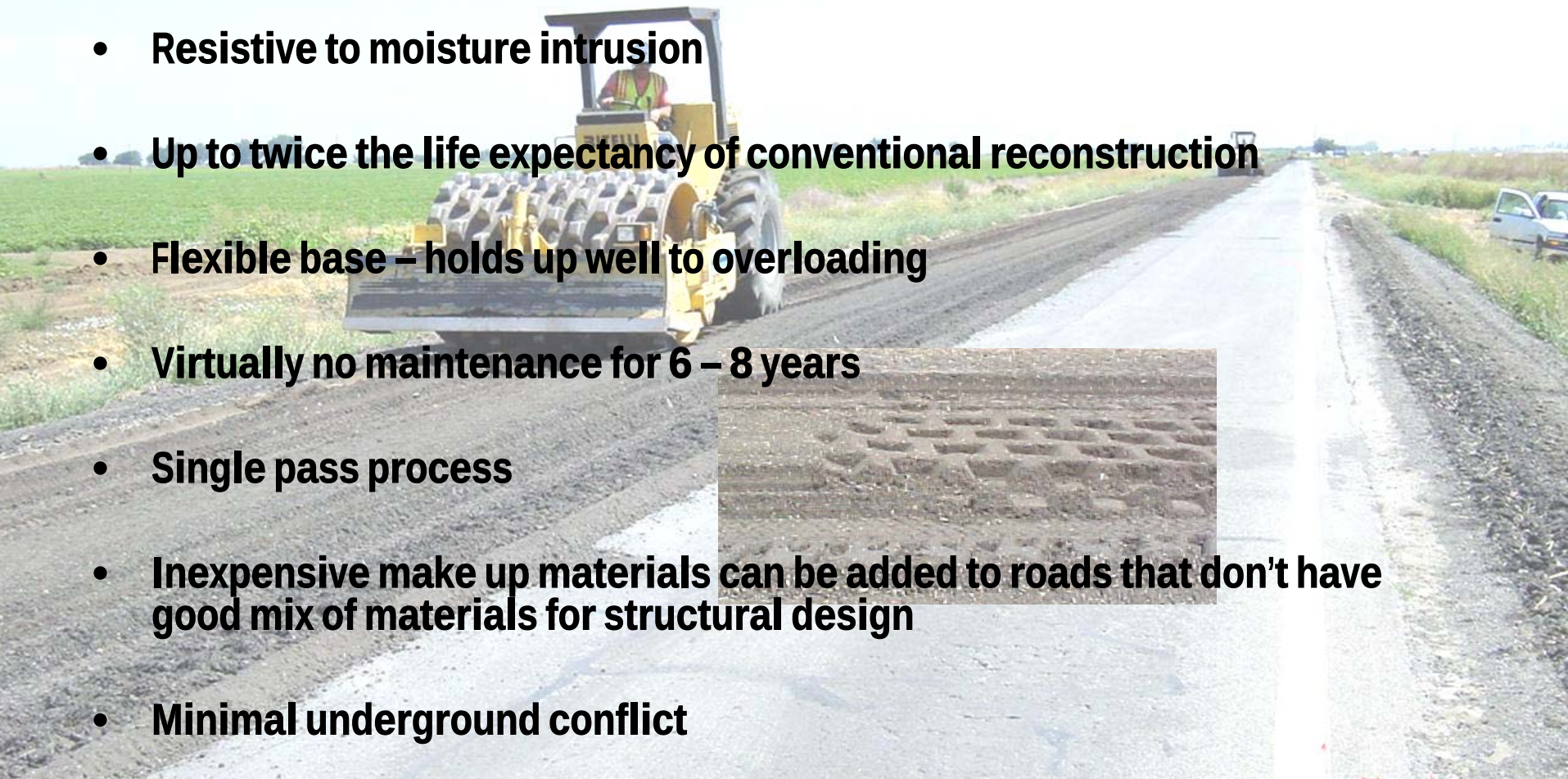
Public Impact

- Keeps trucks off the road – 1 truckload of asphalt oil keeps over 70 trucks off the road
- Less than half the time of conventional reconstruction
- Road open for traffic same day
- Friendly to businesses along reconstruction route
- High Safety consideration



Foamed Asphalt Benefits

- Eliminates repeated dig out repairs
- Eliminates reflective & reduces thermal cracking
- Resistive to moisture intrusion
- Up to twice the life expectancy of conventional reconstruction
- Flexible base – holds up well to overloading
- Virtually no maintenance for 6 – 8 years
- Single pass process
- Inexpensive make up materials can be added to roads that don't have good mix of materials for structural design
- Minimal underground conflict



Foamed Asphalt vs Reconstruction

TI 6 Roadway

100,000 SF

Reconstruction

- Remove 8.5" Asphalt, Aggregate Base, Subgrade Soils
- Import 6" of New Aggregate Base
- 2.5" Asphalt Surfacing

R-value 50

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 5" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 5" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 6 Roadway

100,000 SF

R-value 50

Reconstruction

- **Remove 8.5" Material** **\$0.75 / SF**
 - 5,500 tons
 - 230 Truckloads
- **Import 6" AB** **\$0.75 / SF**
 - 3,700 tons
 - 155 Truckloads
- **2.5" Asphalt Surfacing** **\$1.80 / SF**
 - 1,800 tons
 - 75 Truckloads
- **Total** **\$3.30 / SF**

Foamed Asphalt

Non-Controlled Grades

- **5" Foam Treatment** **\$0.90 / SF**
- **Compact & Grade** **\$0.35 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$2.45 / SF**

Foamed Asphalt

Controlled Grades

- **Pre Pulverize** **\$0.10 / SF**
- **Remove material** **\$0.35 / SF**
- **5" Foam Treatment** **\$0.90 / SF**
- **Compact & Grade** **\$0.35 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$2.90 / SF**

Foamed Asphalt vs Reconstruction

TI 6 Roadway

100,000 SF

Reconstruction

- Remove 17.5" Asphalt, Aggregate Base, Subgrade Soils
- Import 15" of New Aggregate Base
- 2.5" Asphalt Surfacing

R-value 5

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 7" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 7" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 6 Roadway

100,000 SF

R-value 5

Reconstruction

- Remove 17.5" Material **\$1.50 / SF**
 - 11,000 tons
 - 460 Truckloads
- Import 15" AB **\$2.00 / SF**
 - 9,400 tons
 - 390 Truckloads
- 2.5" Asphalt Surfacing **\$1.80 / SF**
 - 1,600 tons
 - 67 Truckloads
- Total **\$5.30 / SF**

Foamed Asphalt

Non-Controlled Grades

- 7" Foam Treatment **\$1.10 / SF**
- Compact & Grade **\$0.35 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$2.65 / SF**

Foamed Asphalt

Controlled Grades

- Pre Pulverize **\$0.10 / SF**
- Remove material **\$0.35 / SF**
- 7" Foam Treatment **\$1.10 / SF**
- Compact & Grade **\$0.35 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$3.10 / SF**

Foamed Asphalt vs Reconstruction

TI 6 Roadway

20,000 SF

Reconstruction

- Remove 8.5" Asphalt, Aggregate Base, Subgrade Soils
- Import 6" of New Aggregate Base
- 2.5" Asphalt Surfacing

R-value 50

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 5" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 5" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 6 Roadway

20,000 SF

R-value 50

Reconstruction

- **Remove 8.5" Material** **\$1.85 / SF**
 - 1,100 tons
 - 46 Truckloads
- **Import 6" AB** **\$1.65 / SF**
 - 740 tons
 - 31 Truckloads
- **2.5" Asphalt Surfacing** **\$1.80 / SF**
 - 360 tons
 - 15 Truckloads
- **Total** **\$5.30 / SF**

Foamed Asphalt

Non-Controlled Grades

- **5" Foam Treatment** **\$1.65 / SF**
- **Compact & Grade** **\$1.00 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$3.85 / SF**

Foamed Asphalt

Controlled Grades

- **Pre Pulverize** **\$0.25 / SF**
- **Remove material** **\$0.70 / SF**
- **5" Foam Treatment** **\$1.65 / SF**
- **Compact & Grade** **\$1.00 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$4.80 / SF**

Foamed Asphalt vs Reconstruction

TI 6 Roadway

20,000 SF

Reconstruction

- Remove 17.5" Asphalt, Aggregate Base, Subgrade Soils
- Import 12" of New Aggregate Base
- 2.5" Asphalt Surfacing

R-value 5

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 7" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 7" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 6 Roadway

20,000 SF

R-value 5

Reconstruction

- Remove 17.5" Material **\$2.50 / SF**
 - 2,200 tons
 - 92 Truckloads
- Import 15" AB **\$2.70 / SF**
 - 1,880 tons
 - 79 Truckloads
- 2.5" Asphalt Surfacing **\$1.80 / SF**
 - 320 tons
 - 14 Truckloads
- Total **\$7.00 / SF**

Foamed Asphalt

Non-Controlled Grades

- 7" Foam Treatment **\$2.30 / SF**
- Compact & Grade **\$1.00 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$4.50 / SF**

Foamed Asphalt

Controlled Grades

- Pre Pulverize **\$0.25 / SF**
- Remove material **\$0.70 / SF**
- 7" Foam Treatment **\$2.30 / SF**
- Compact & Grade **\$1.00 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$5.45 / SF**

Foamed Asphalt vs Reconstruction

TI 10 Roadway

100,000 SF

Reconstruction

- Remove 14" Asphalt, Aggregate Base, Subgrade Soils
- Import 8" of New Aggregate Base
- 6" Asphalt Surfacing

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 8" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 8" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 10 Roadway

100,000 SF

R-value 50

Reconstruction

- **Remove 14" Material** **\$2.00 / SF**
 - 8,650 tons
 - 360 Truckloads
- **Import 8" AB** **\$1.50 / SF**
 - 4,940 tons
 - 206 Truckloads
- **6" Asphalt Surfacing** **\$3.60 / SF**
 - 3,700 tons
 - 67 Truckloads
- **Total** **\$7.10 / SF**

Foamed Asphalt

Non-Controlled Grades

- **8" Foam Treatment** **\$1.25 / SF**
- **Compact & Grade** **\$0.35 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$2.80 / SF**

Foamed Asphalt

Controlled Grades

- **Pre Pulverize** **\$0.10 / SF**
- **Remove material** **\$0.35 / SF**
- **8" Foam Treatment** **\$1.25 / SF**
- **Compact & Grade** **\$0.35 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$3.25 / SF**

Foamed Asphalt vs Reconstruction

TI 10 Roadway

100,000 SF

Reconstruction

- Remove 29.5" Asphalt, Aggregate Base, Subgrade Soils
- Import 23.5" of New Aggregate Base
- 6" Asphalt Surfacing

R-value 5

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 10" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 10" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 10 Roadway

100,000 SF

R-value 5

Reconstruction

- **Remove 29.5" Material** **\$3.50 / SF**
 - 18,200 tons
 - 763 Truckloads
- **Import 23.5" AB** **\$3.50 / SF**
 - 14,500 tons
 - 609 Truckloads
- **6" Asphalt Surfacing** **\$3.60 / SF**
 - 3,700 tons
 - 154 Truckloads
- **Total** **\$10.60 / SF**

Foamed Asphalt

Non-Controlled Grades

- **10" Foam Treatment** **\$1.55 / SF**
- **Compact & Grade** **\$0.35 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$3.10 / SF**

Foamed Asphalt

Controlled Grades

- **Pre Pulverize** **\$0.10 / SF**
- **Remove material** **\$0.35 / SF**
- **10" Foam Treatment** **\$1.55 / SF**
- **Compact & Grade** **\$0.35 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$3.55 / SF**

Foamed Asphalt vs Reconstruction

TI 10 Roadway

20,000 SF

Reconstruction

- Remove 14" Asphalt, Aggregate Base, Subgrade Soils
- Import 8" of New Aggregate Base
- 6" Asphalt Surfacing

R-value 50

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 8" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 8" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 10 Roadway

20,000 SF

R-value 50

Reconstruction

- **Remove 14" Material** **\$2.25 / SF**
 - 1,730 tons
 - 72 Truckloads
- **Import 8" AB** **\$1.90 / SF**
 - 990 tons
 - 42 Truckloads
- **6" Asphalt Surfacing** **\$3.60 / SF**
 - 740 tons
 - 30 Truckloads
- **Total** **\$7.75 / SF**

Foamed Asphalt

Non-Controlled Grades

- **8" Foam Treatment** **\$2.50 / SF**
- **Compact & Grade** **\$1.00 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$4.70 / SF**

Foamed Asphalt

Controlled Grades

- **Pre Pulverize** **\$0.25 / SF**
- **Remove material** **\$0.70 / SF**
- **8" Foam Treatment** **\$2.50 / SF**
- **Compact & Grade** **\$1.00 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$5.65 / SF**

Foamed Asphalt vs Reconstruction

TI 10 Roadway

20,000 SF

Reconstruction

- Remove 29.5" Asphalt, Aggregate Base, Subgrade Soils
- Import 23.5" of New Aggregate Base
- 6" Asphalt Surfacing

R-value 5

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 10" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 10" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

TI 10 Roadway

20,000 SF

R-value 5

Reconstruction

- **Remove 29.5" Material** **\$4.50 / SF**
 - 3,640 tons
 - 152 Truckloads
- **Import 23.5" AB** **\$4.00 / SF**
 - 2,900 tons
 - 121 Truckloads
- **6" Asphalt Surfacing** **\$3.60 / SF**
 - 740 tons
 - 31 Truckloads
- **Total** **\$12.10 / SF**

Foamed Asphalt

Non-Controlled Grades

- **10" Foam Treatment** **\$3.00 / SF**
- **Compact & Grade** **\$1.00 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$5.20 / SF**

Foamed Asphalt

Controlled Grades

- **Pre Pulverize** **\$0.25 / SF**
- **Remove material** **\$0.70 / SF**
- **10" Foam Treatment** **\$3.00 / SF**
- **Compact & Grade** **\$1.00 / SF**
- **2" Asphalt Surfacing** **\$1.20 / SF**
- **Total** **\$6.15 / SF**

Foamed Asphalt vs Reconstruction

100,000 SF

5% Patching Area

Patch Pave & Overlay

- Remove 6" deep for failure areas
- Patch with 6" of Asphalt
- Paving Fabric
- 2.5" Overlay Surfacing

Foamed Asphalt

Non-Controlled Grades

- Foam Asphalt Treatment to 7" depth
- 2" Asphalt Surfacing

Foamed Asphalt

Controlled Grades

- Pre Pulverize Existing Asphalt & Aggregate
- Remove pulverized material to allow for depth of asphalt surfacing
- Foam Asphalt Treatment to 7" depth
- 2" Asphalt Surfacing

Foamed Asphalt vs Reconstruction

100,000 SF

5% Patching Area

Patch Pave & Overlay

- Remove 6" Material **\$0.25 / SF**
 - 185 tons
 - 8 Truckloads
- 6" Patch Paving **\$0.50 / SF**
 - 185 tons
 - 8 Truckloads
- Paving Fabric **\$0.50 / SF**
- 2.5" Asphalt Surfacing **\$1.80 / SF**
 - 1,600 tons
 - 67 Truckloads
- Total **\$3.05 / SF**

Foamed Asphalt

Non-Controlled Grades

- 7" Foam Treatment **\$1.10 / SF**
- Compact & Grade **\$0.35 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$2.65 / SF**

Foamed Asphalt

Controlled Grades

- Pre Pulverize **\$0.10 / SF**
- Remove material **\$0.35 / SF**
- 7" Foam Treatment **\$1.10 / SF**
- Compact & Grade **\$0.35 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$3.10 / SF**

Foamed Asphalt vs Reconstruction

100,000 SF

10% Patching
Area

Patch Pave & Overlay

- Remove 6" Material **\$0.50 / SF**
 - 370 tons
 - 16 Truckloads
- 6" Patch Paving **\$1.00 / SF**
 - 370 tons
 - 16 Truckloads
- Paving Fabric **\$0.50 / SF**
- 2.5" Asphalt Surfacing **\$1.80 / SF**
 - 1,600 tons
 - 67 Truckloads
- Total **\$3.80 / SF**

Foamed Asphalt

Non-Controlled Grades

- 7" Foam Treatment **\$1.10 / SF**
- Compact & Grade **\$0.35 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$2.65 / SF**

Foamed Asphalt

Controlled Grades

- Pre Pulverize **\$0.10 / SF**
- Remove material **\$0.35 / SF**
- 7" Foam Treatment **\$1.10 / SF**
- Compact & Grade **\$0.35 / SF**
- 2" Asphalt Surfacing **\$1.20 / SF**
- Total **\$3.10 / SF**

Completed Projects

- **Main Prarie Road – Solano County**
- **Road 29 – Yolo County**
- **Kaufman Avenue – Tehama County**
- **Roads 8, 99W, 89B – Yolo County**
- **Hwy 20 – Williams Caltrans**
- **Indio Road – Sacramento**
- **Wheatland Road – Yuba County**
- **2001 Pavement Rehab – Marysville**
- **DWR Canal Repair – Dept. Water Resources**
- **Compost Pad – Hay Road Landfill**
- **Main Street – Cloverdale**
- **Compost Pad – Pacheco Pass Landfill**
- **Bruce Road – Chico**
- **Estates Drive – Vacaville**
- **Concord Avenue – Brentwood**
- **2002 Street Improvement – American Canyon**

Completed Projects

- **Hwy 89 – Caltrans**
- **Mountain House Parkway – Mountain House**
- **Route 84 – Caltrans**
- **Edmonds Drive – Carson City**
- **Hammonton Smartville Road – Yuba County**
- **McGowan Parkway – Yuba County**
- **Hwy 132 – Caltrans**
- **Olympic Drive – Clearlake**
- **Sacramento Int'l Airport – Sacramento**
- **Rehab & Overlay – Amador County**
- **Spenceville Road – Yuba County**
- **Stage Coach Road – Stockton**
- **McHenry Avenue – Escalon**
- **Loma Rica Road – Yuba County**
- **Road 102 – Yolo County**
- **Hwy 120 – Caltrans**

Completed Projects

- **Franklin Street – Fort Bragg**
- **Road 21A & 85B – Yolo County**
- **Hwy 32 – Caltrans**
- **Maintenance Yard – NDOT**
- **Measure B - Novato**



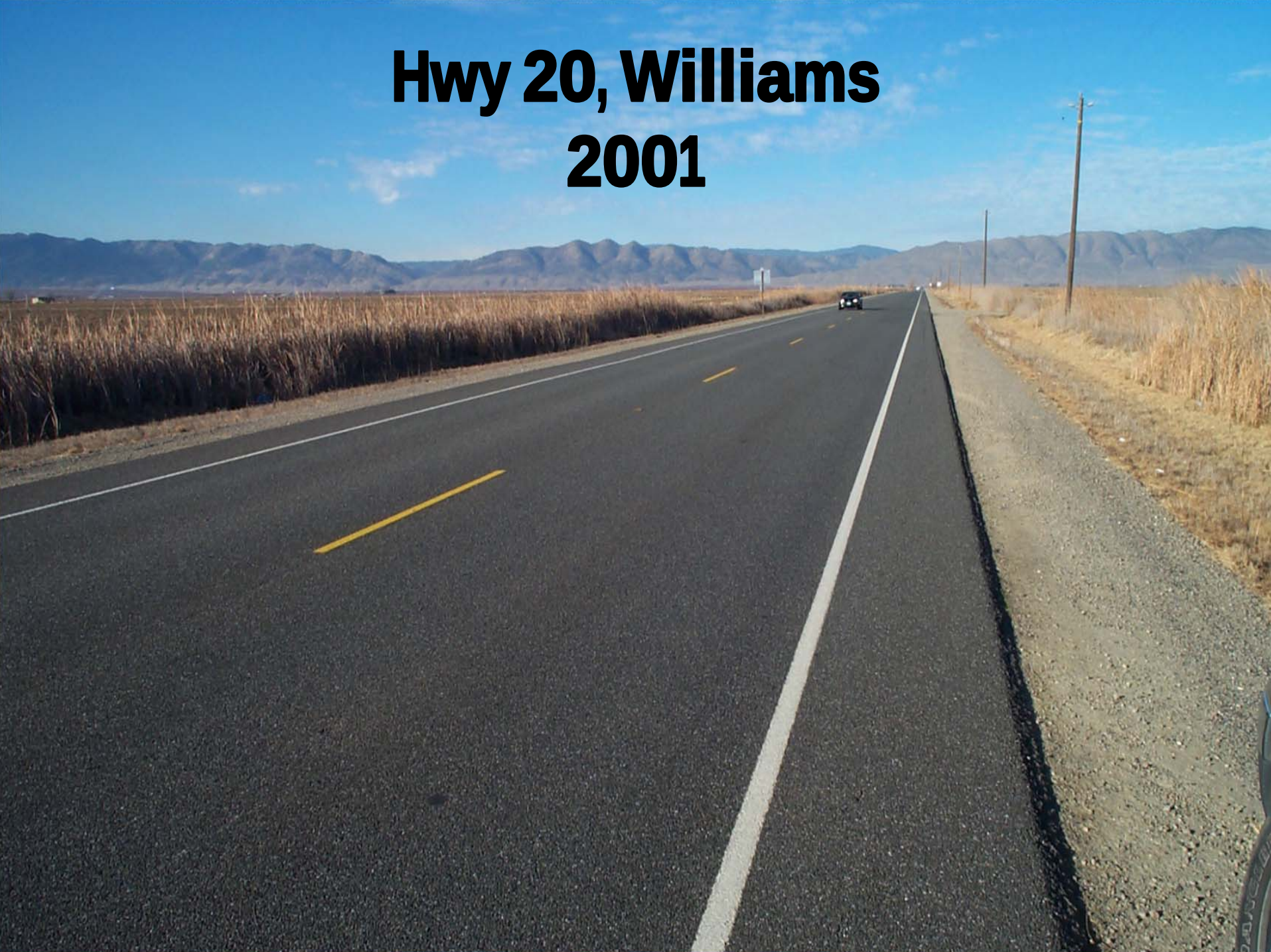
Maine Prarie Road, Dixon 2000



Hwy 8 Overpass , Dunnigan 2001



Hwy 20, Williams 2001



Concord Avenue, Brentwood 2002



Mt. House Parkway, Mt. House

2002



Stagecoach Road, Stockton 2004



McHenry Drive, Escalon

2004

