Chip Seals for Higher Volume Roads

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TxDOT Statistics

- Maintains 79,500 centerline miles
- 190,000 lane miles
- 460 million daily vehicle miles.
- Maintain and Inspect 49,000 bridges
TxDOT Statistics

Fiscal Year 2007 Budgets:

- Routine Maintenance = $492 mil
- Contracted Maintenance = $434 mil
- Preventive Maintenance = $265 mil
- Rehabilitation = $898 mil
TxDOT Statistics

- 15,000 employees
- 322 thousand road condition hot line calls
- 448 thousand overweight truck permits
- 19.1 million vehicles
- $22 million in transportation research
Seal Coat Statistics

- In FY 2006 TxDOT Seal Coated 16,517 LM
- Assuming each lane averages 12’ wide, that is 116,279,680 SY
- At .45 gallons per SY, that is 52,325,856 gallons of asphalt or emulsion
- At 1 CY per 100 SY, that is 1,162,797 CY of aggregate
Texas Seal Coat Binders

- AC binders include AC-5, 10, 15 with additives such as polymers, tire rubber, CRS-2, 2H and 2P, HFRS-2P.

- Emulsions include RS-1P, CRS-2P, RC-250, 800 and 3000, MC-250, 800, 3000, 2400L.
Seal Coat

A seal coat (chip seal) is generally a single, double or triple application of asphaltic material covered with aggregate.
Seal Coat (chip seal)

- Consists of spraying asphalt material (asphalt cement or emulsified asphalt) followed immediately by a thin aggregate cover.
FY 2000 - FY 2006
Seal Coat Dollars Spent

2000 2001 2002 2003 2004 2005 2006
Fiscal Year

Dollars Spent

100,000,000 120,000,000 140,000,000 160,000,000 180,000,000 200,000,000 220,000,000 240,000,000
Texas Seal Coat
Texas Seal Coat
Trans-Texas Corridor Seal Coats

...TxDOT applies seal coat to existing pavement to extend the life of the pavement and to protect the base material from water intrusion.
Seal Coats

...service life varies depending on traffic volumes, weather, etc.
Seal Coats do not:

- Strengthen the existing pavement
- Increase the load-bearing capacity
- Smooth out rough pavement
- Bridge major cracks (wider than 1/8 inch)
- Eliminate the need for maintenance or reconstruction
In some areas seal coats have been limited to low traffic volume roads.

**Why?**

The standard answers to that question are:

1) vehicle damage, especially broken windshields caused by flying chips;

2) premature failure; and

3) road noise.
Texas Seal Coat
Texas Seal Coat
Embedment

Generally, on low volume roads, the aggregate particles should be approximately 40 to 50% embedded.
Embedment

Generally, on high volume roads, the aggregate particles should be approximately 30 to 40% embedded.
Evaluating Traffic Conditions

- Traffic volume or ADT determines amount of binder needed for aggregate embedment
- Heavy vehicles reduce binder rate
- ADT is calculated using an adjustment factor for heavy vehicles.
Project Selection

- Pick the right road at the right time
- Structurally sound
- In no need of major repair
- Minor surface deficiencies such as cracking, raveling, bleeding and lack of skid resistance
Potential Problems on High ADT Roadways:

- Short term aggregate loss
- Vehicular damage from loose aggregate
- Potential flushing
- Tire noise
- Prolonged traffic control
Causes of short term aggregate loss

- Aggregate not applied quickly enough
- Inadequate binder quantity
- Inadequate aggregate embedment
- Dirty aggregate
Texas Seal Coat
Texas Seal Coat
Texas Seal Coat
New Zealand
New Zealand
International Seals
Montana
Montana
Montana
Best Practices for High Volume Roads:

- Decrease aggregate size
- Reduce excess aggregate
- Use light-weight aggregate
- Use pre-coated aggregate for improved adhesion
- Use polymer modifiers for improved adhesion