ROAD DUST MANAGEMENT
A NATIONAL AND INTERNATIONAL PERSPECTIVE

2008 Road Dust Management Practices and Future Needs Conference
November 13-14, 2008
San Antonio, Texas

Michael T. Long
Chair, TRB
Low-Volume Roads Committee
Oregon D.O.T.

TOPICS

- ***Dust in the Abstract***
- ***Dust on a Global Scale***
- ***Dust at the Project or Road Level***
- ***U.S. and International Examples***

Ashes to Ashes, Dust to Dust

Faith, Trust, and a little Pixie Dust

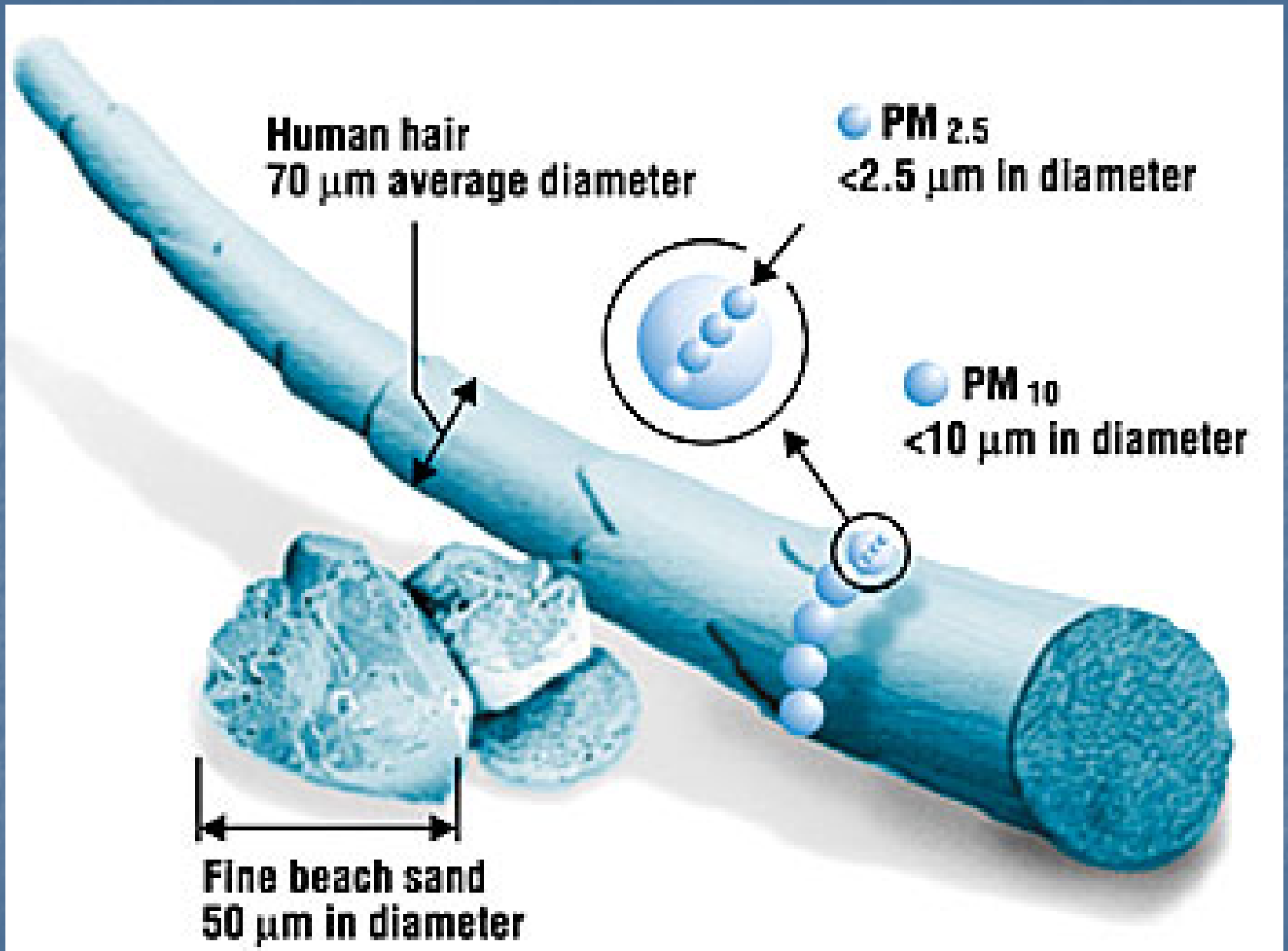


Image courtesy of EPA Office of Research and Development

From a Global Perspective

Dust Storm from the Sahara Desert Blowing toward the Canary Islands and Florida

The Middle East and the Arabian Peninsula


Baja California

Dust Issues in Interplanetary Exploration

Global Climate Change

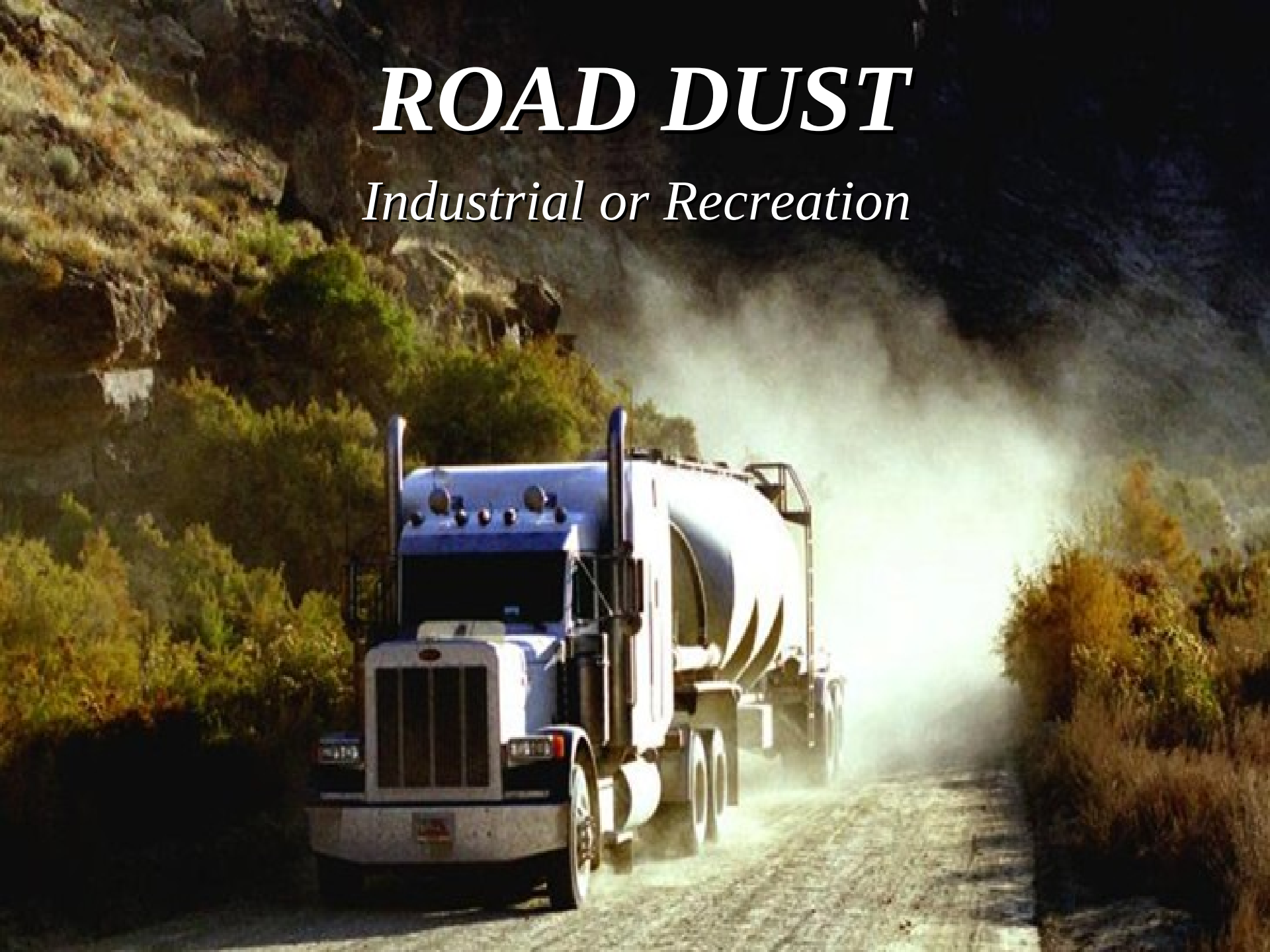

And the great Dust Bowl
of the American mid-west
1931-1939


IF IT'S SILICA, OSHA
DO US
IT'S NOT JUST DUST.

Mining

Agriculture

Airfields


ROAD DUST
Industrial or Recreation

Rural or Residential

It’s Still a Problem

EARLY ROAD DUST MANAGEMENT ATTEMPTS

1909 July 25 New York Times, New York, New York Lenox, MA – "Mrs. William Pollock has caught the fancy for dustless roads from the experiments carried on by the Lenox and Stockbridge authorities, and at her own expense has oiled a mile of highway on Holmes Road, fronting her Holmesdale property, setting an example for the rest of the rich property owners. The experiments carried on by the Lenox village association in sprinkling highways with calcide has proved a failure in Lenox and has been abandoned. This new movement for dustless roads is largely due to the increased number of automobile tourists and the wearing of the surface of the highways by the travel and suction caused by the heavy motors.

Palliatives & Stabilizers

Deep Mixing

U.S. State and Local Issues

Missouri
Geotextiles

Freeman & Bowders, 2007

Photos courtesy John Bowders

Reduces Subgrade PM 10 Migration

50% – 75% Reduction
in this study

Freeman & Bowders, 2007
Photo courtesy John Bowders

Virginia

- **The D.O.T. manages over 18,000 miles of unpaved roads**
- **Philosophy is based on the South African Model of "minimizing aggregate loss"**
- **Comprehensive Road Management Program Which includes deep mixing of soil stabilizers**

Bill Bushman, Anderson & Associates

"And the more dust that leaves your road surface the less road surface that remains. As dust departs, aggregates and other fines loosen, leading to surface woes and costly replacement with new gravel."

Better Roads Magazine

Kansas

FUNDING ISSUES

But the unpaved roads that generate dust exist primarily because the rural jurisdictions in which they occur never could afford to pave them in the first place. These road departments may be unable to generate the funds needed to control dust."

Road Management and Engineering Journal

Kansas

COST SHARE SOLUTION

Since 1989 most counties have adopted a plan whereby the county provides the contracting service and shares part of the cost.

Cost to home owners Range from 1/3 to almost full cost

- ***Pottawatomie County: Magnesium Chloride in 1999 @ 30cents/LF***
- ***Miami County 2007 MgCl $1.50/LF; $5/LF for asphalt oil***
- ***Coffey County 2007 90cents/LF for MgCl***

Oregon

NO COST-SHARE

Entire cost and contracting for dust control is born by the resident

2002 Coos County dust abatement policy:

AND IT FURTHER APPEARING to the BOARD that it would not be fiscally possible or desirable to make free dust control to all County residents, but recognizes the importance of dust control, and as such is prepared to allow persons to treat sections of County Roads with a product to control dust, at their own cost, subject to the policies stated herein below.

International Issues

Nigeria

USE OF LOCAL MATERIALS

Nigeria

OIL PALM TREE

Nigeria

PALM OIL PRODUCTS

Nigeria

PALM OIL PRODUCTS

Nigeria

Residual by- product is the palm kernel shells

Nigeria

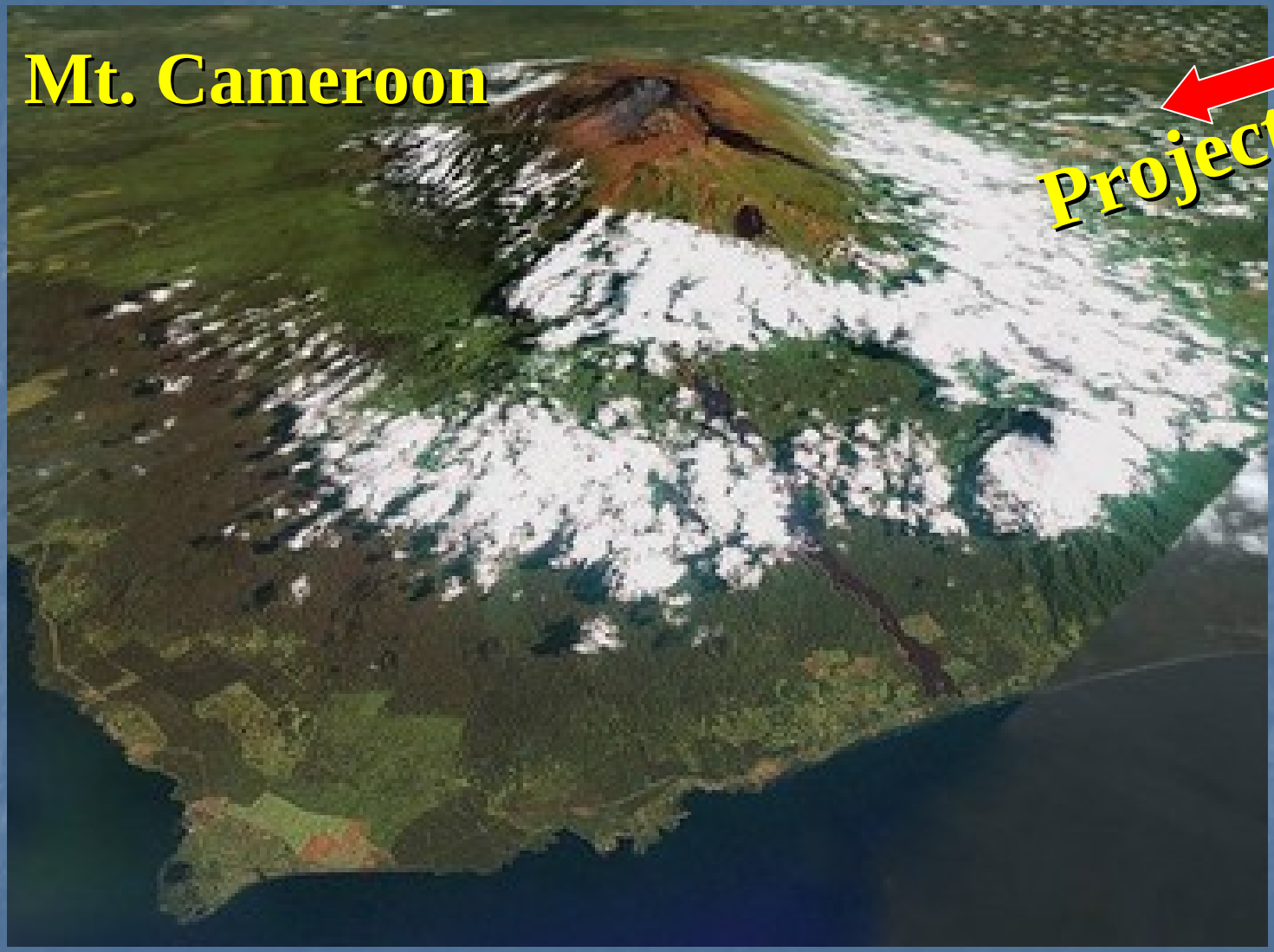
Palm kernel shells were placed on an unpaved section of the Minna-Saukankahuta Road :

- **5 test sections 30mm deep 5 meters long**
- **5 day test showed that dust generation volume decreased up to 75%.**
- **No long-term tests have been completed to determine durability or longevity.**

Cameroon

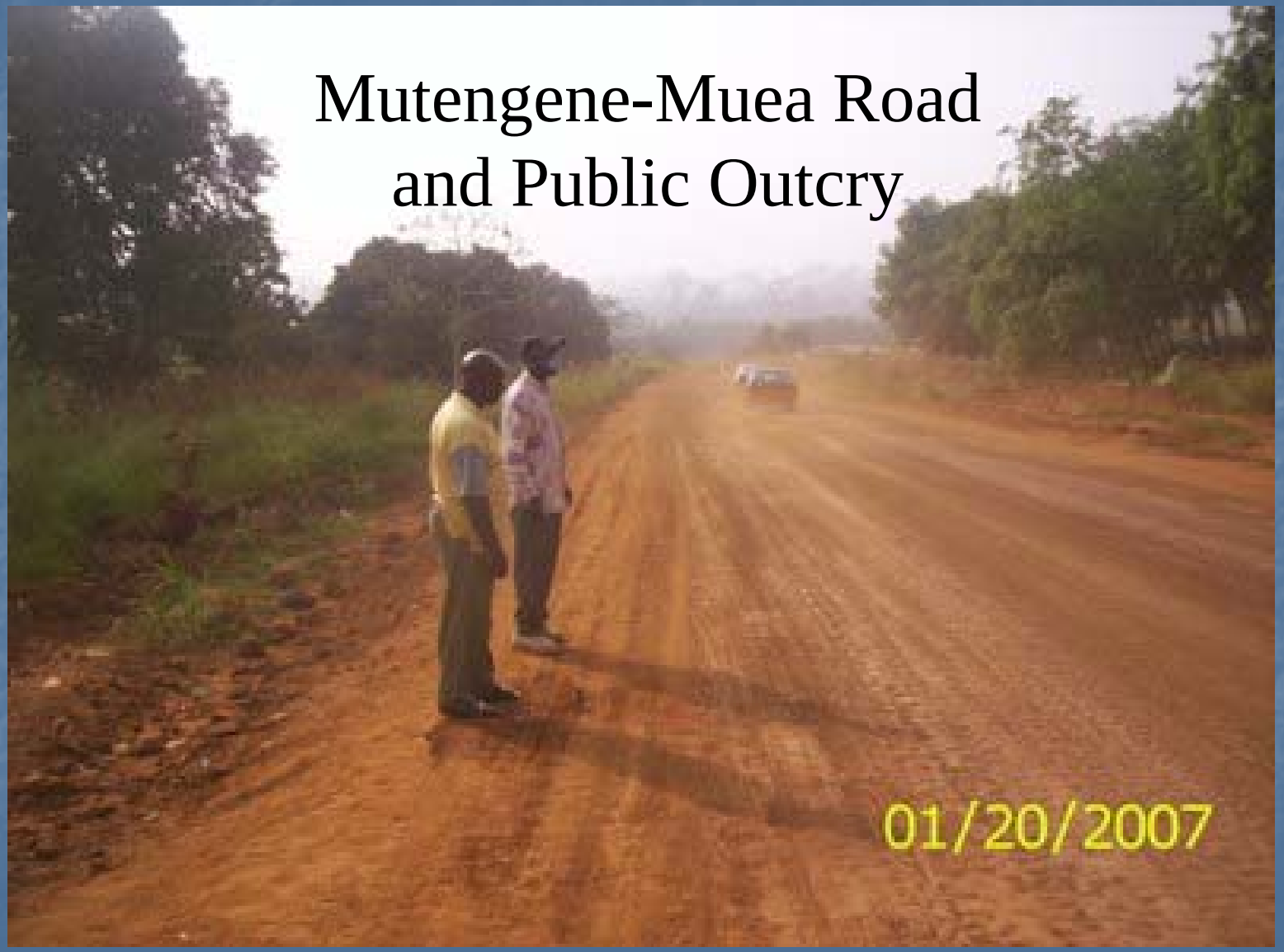
MANAGING COMMMUNITY AFFAIRS

Cameroon




Lava flow from the 2000 eruption

Cameroon



Cameroon

"We are suffering a lot from the dust caused by the road construction. The workers go about their job without watering the road. Dust gets into our houses…It has given us chronic cough. For that matter the locals said they mobilized at one moment and blocked the road to compel the road builders to start watering the road." Anthony Akari, resident of Bomaka

Cameroon

"Graded a few yeas ago, the stretch of road after Long Street toward Bishop Rogan College is another dust blower. The locals in a bid to slow down speeding vehicles that churn up the dust have arranged stones on the road. Thus, motorists are forced to slow down and dodge around them" Anthony Akari, resident of Bomaka

Cameroon

South Africa

South Africa

PUBLIC ROADS

Model of "minimizing aggregate loss" with a comprehensive Road Management Program which includes design and maintenance, deep mixing of soil stabilizers, and standardized evaluation on non-standard products for selection purposes.

South Africa

MINING

74% of surface mining accidents include dust as a significant cause.

- **Developed a Comprehensive Strategy**
  - **Criteria for water-based applications**
  - **Economic evaluation for method for chemical dust palliative selection and cost effectiveness to rejuvenate wearing surfaces.**

Thompson and Visser, 2007

NW Australia

Bauxite Surface Mining

Photo courtesy of Tim Blumfield,
Griffiths University, Brisbane, Australia

Photo courtesy of Tim Blumfield
Griffiths University, Brisbane, Australia

Photo courtesy of Tim Blumfield
Griffiths University, Brisbane, Australia

Photo courtesy of Tim Blumfield

Photo courtesy of Tim Blumfield
Griffiths University, Brisbane, Australia

SUMMARY

"…what's needed is a comprehensive approach to road improvement (design along with preservation of fines and surface smoothness)

…Environmental performance…it would seem to me that a standardized set of criterion should be promoted by TRB and developed by ASTM that all users and suppliers could look to as a comparative gauge of environmental performance."

Melvin Main, Midwest Industrial Supply

Highest and Best Use

Is always a matter of perspective