



I-40 Rock Slides, Haywood County

February 10, 2012

Chief Engineer, Jon Nance



Minor Rock Slide, Feb. 3, 2012





Mountain History

- Formed at least 700 million years ago
- Between 400 – 500 feet tall
- Believed to predate the mountains here **BEFORE** the Appalachians
- Formed from an extremely ancient ocean bed





I-40 from US 276 to Tennessee was constructed in the 1960's





I-40 (October 24, 1968)





First Major Rock slide, 1980





Major Rock slide at Tunnels, 1985





Tunnel Detour Route, 1985





Third Major Rock Slide, 1997





Pigeon River Slope Failure, 2003





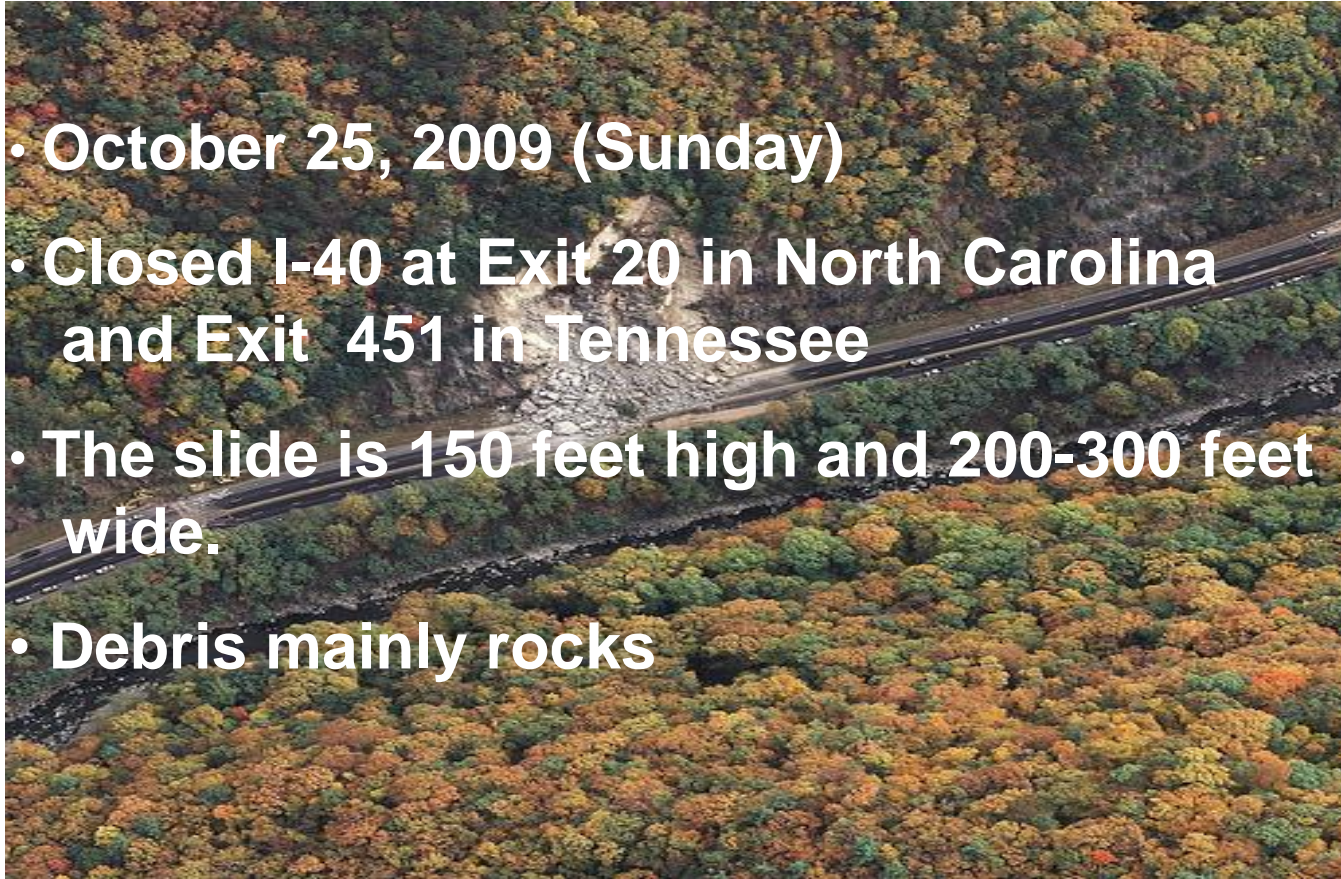
Pigeon River Slope Failure, 2003

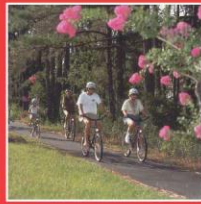
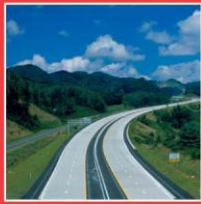




Major Rock Slide, 2009

- October 25, 2009 (Sunday)
- Closed I-40 at Exit 20 in North Carolina and Exit 451 in Tennessee
- The slide is 150 feet high and 200-300 feet wide.
- Debris mainly rocks





I-40 Haywood County

TN / NC

Slide Area @ 2.5mm

Image- 2008 Haywood County NAIP
Drainage -GIS Haywood County

Scale: 1"=400'





Major Rock Slide, 2009





Major Rock Slide, 2009





Major Rock Slide, 2009





Major Rock Slide, 2009





Major Rock Slide, 2009





Major Rock Slide, 2010





Minor Rock Slide, Feb. 3, 2012





Minor Rock Slide, Feb. 3, 2012





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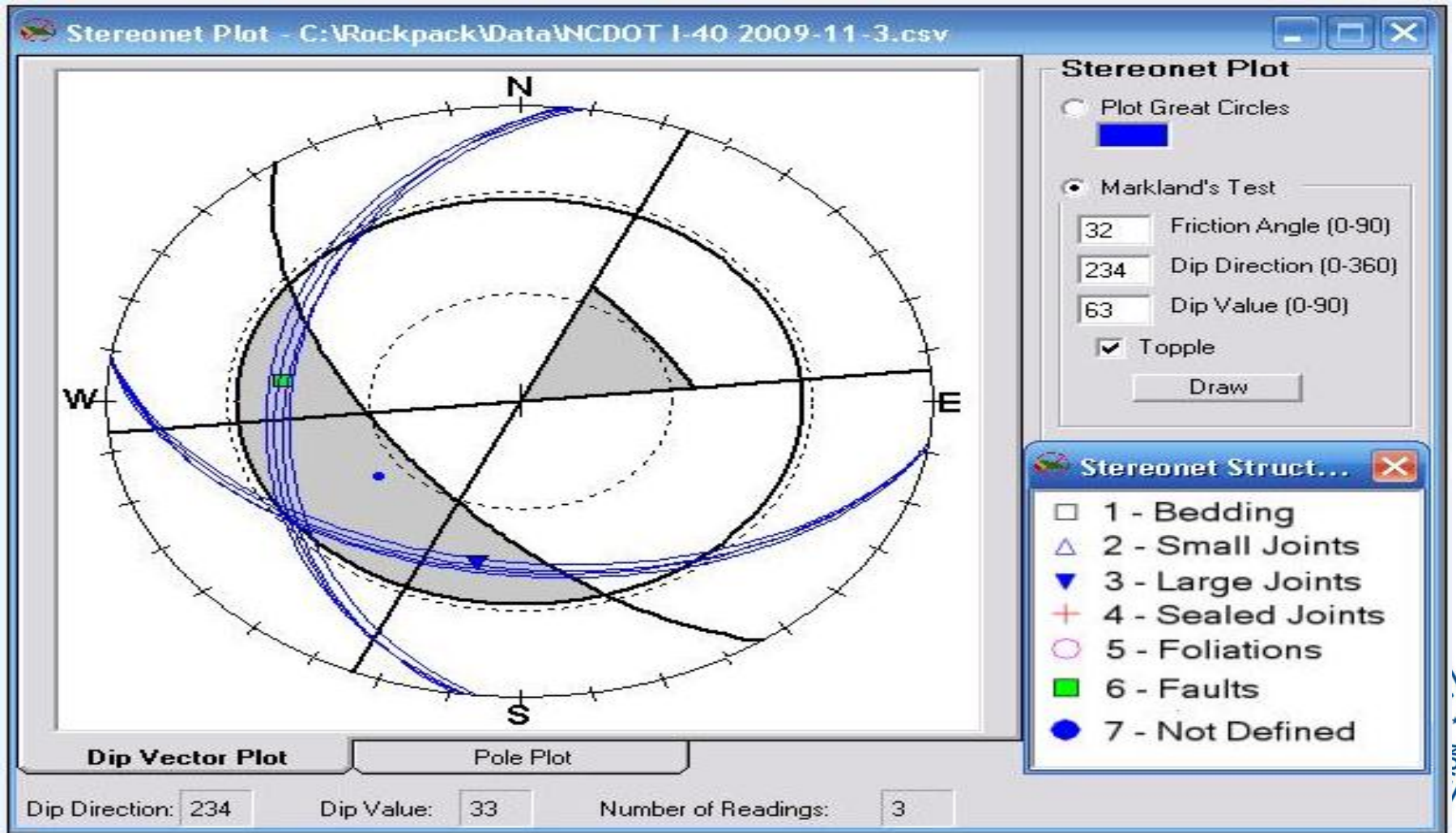


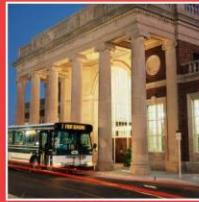
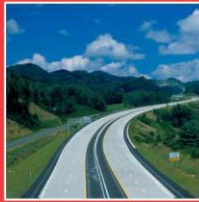


February 3rd, 2012 Rockslide

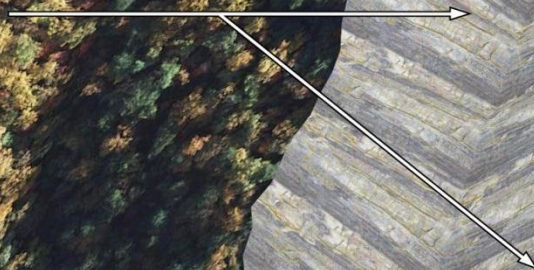
- Occurred around noon, I-40 westbound at Mile Marker 7. This section of interstate was already closed due to the Tennessee rockslide.
- 600 tons of rock fell onto road; some boulders were as big as small cars.
- Crews began hauling rock within 3 hours
- Certified professional climbers from Ameritech Slope Constructors Inc. scaled the mountain and removed additional loose rock.
- **Within 24 hours of starting clean-up efforts, crews had secured all loose rock on the mountainside and removed all rock from the roadway.**
- I-40 West from Exit 20 reopened on Sunday, Feb. 5, at 2:30 a.m.
- The “drape” installed in 2012 helped reduce damage by keeping falling rock close to mountain.







ROCK FRACTURE
PLANES



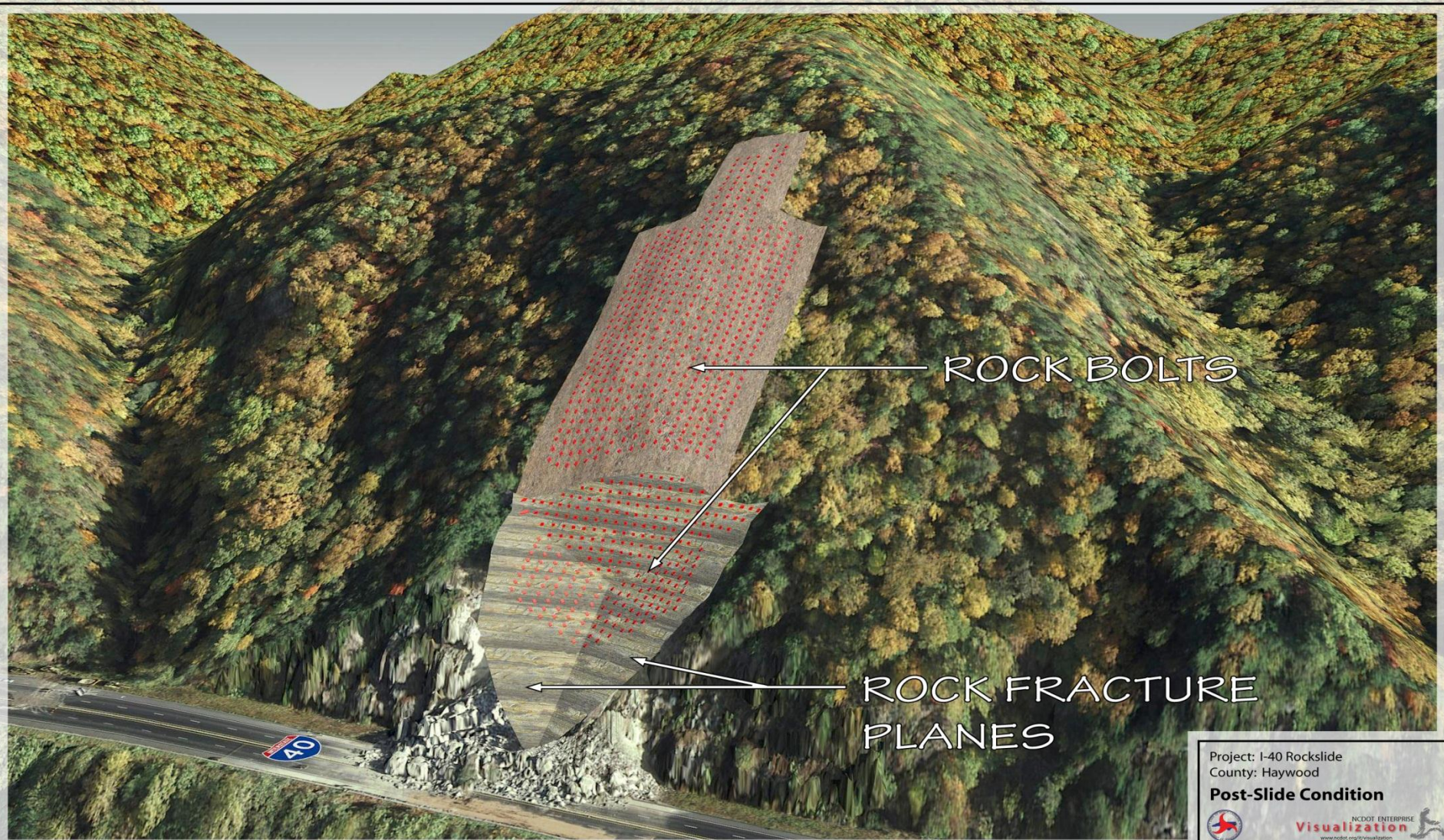
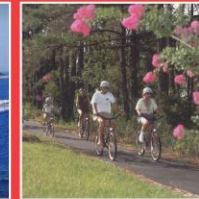
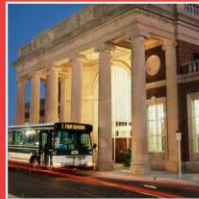
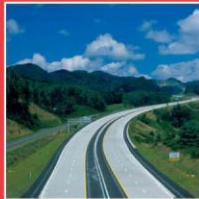
Project: I-40 Rockslide
County: Haywood
Post-Slide Condition



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Visualization

www.ncdot.org/Visualization





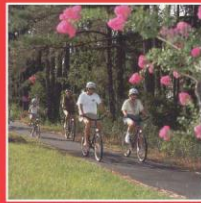
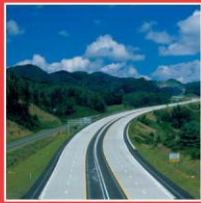
ROCK BOLTS

ROCK FRACTURE
PLANES

Project: I-40 Rockslide
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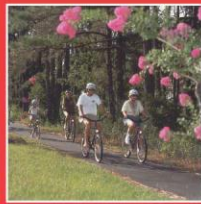
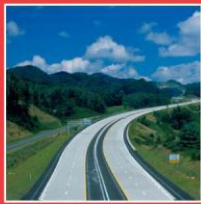


NCDOT ENTERPRISE
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Rock Bolt





Rock Bolts









Communicating with the Public

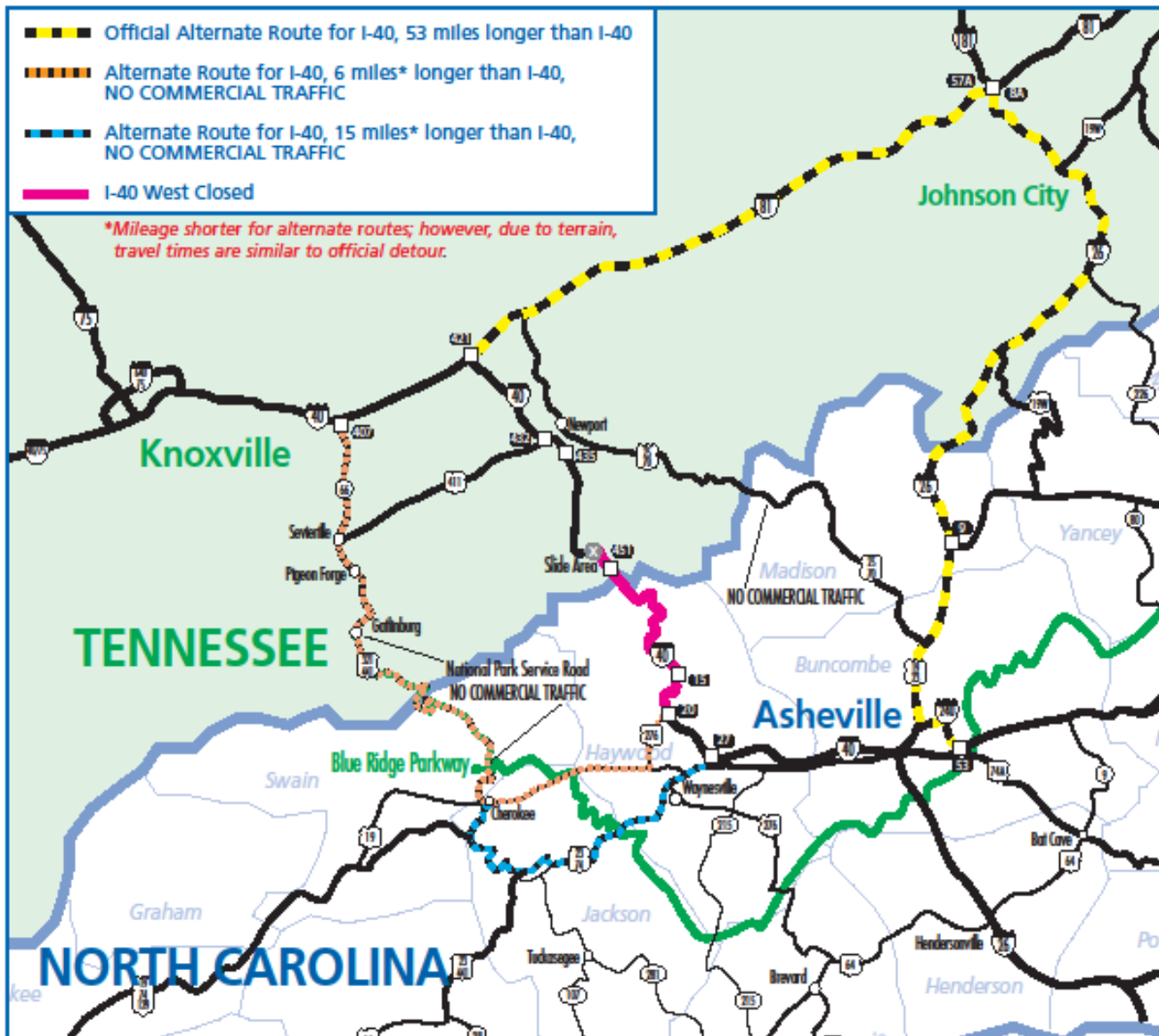
- Webpage – direct link
- Press Releases – Daily M-F while road closed
- Press Conferences – At critical times
- News Media Interviews – TV, Radio, Newspaper
- Twitter and YouTube
- Phone and Email
- 511 Travelers Information
- Overhead Message Boards



I-40 WEST ROCKSLIDE DETOUR INFO

-  Official Alternate Route for I-40, 53 miles longer than I-40
-  Alternate Route for I-40, 6 miles* longer than I-40, NO COMMERCIAL TRAFFIC
-  Alternate Route for I-40, 15 miles* longer than I-40, NO COMMERCIAL TRAFFIC
-  I-40 West Closed

**Mileage shorter for alternate routes; however, due to terrain, travel times are similar to official detour.*




Interstate Travelers: Follow detour around rockslide near Tennessee border.

Caution for GPS Users: Out-of-date GPS information could make you miss detour, delaying your trip.

Winter Weather Advisory: Check ahead if traveling on Blue Ridge Parkway or U.S. 441 in Great Smoky Mountains National Park. Sections of those highways often are closed during winter.

- Blue Ridge Parkway call (828) 298-0398
- Great Smoky Mountains National Park (865) 436-1200.

 Plan ahead by visiting the NCDOT Traveler Information Management System Web site at www.ncdot.gov/traffictrav/ave/ or calling 511, the state's free travel information line.



How are we going to fix this?





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I-40 West in North Carolina Mountains Now Open to Traffic after Rockslides



RALEIGH — The N.C. Department of Transportation reopened I-40 West from Exit 20 to the Tennessee state line to traffic on Sunday, Feb. 5, at 2:30 a.m. The road had been closed since Jan. 31...

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NCDOT Putting Recovery Funds to Work



Transportation Reform



Organizational Performance Dashboard



Setting Government Straight

News Releases and Updates

- [TRAFFIC ADVISORY FOR I-40 IN WESTERN NORTH CAROLINA MAY 16](#) (5/14/2010)
- [NCDOT AWARDS CONTRACT TO STABILIZE SITES NEAR I-40 ROCKSLIDE](#) (5/4/2010)
- [NCDOT, LOCAL PARTNERS CELEBRATE REOPENING OF INTERSTATE 40 IN HAYWOOD COUNTY](#) (4/27/2010)
- [INTERSTATE 40 IN WESTERN NORTH CAROLINA OPENED SUNDAY, APRIL 25, AT 6 P.M.](#) (4/25/2010)

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Photos

Photos from the [Flickr page](#).

I40_RockSlide Updates From Twitter



5/26/2010: i40_RockSlide: Shorter rolling road blocks while helicopter flies should relieve congestion.

Follow  [I40_RockSlide](#) for up to the minute alerts.





Drill rig on the mountainside

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Video

A look at the reopening of Interstate 40 at 6 PM on April 25, 2010. The road had been closed near the North Carolina/Tennessee border since Oct. 25, 2009 because of a rockslide.





Future Monitoring of the Slide

- Four Roctest Bor-ex Extensimeters
- Two Vibrating Wire Piezometers
- Two bar anchors instrumented with 5 vibrating wire strain gauges
- Two Tuff Tilt 801 tiltmeters (+/- 3 degrees) for the face
- All wired to a datalogger with cell phone access



