SR 331 Experimental Project

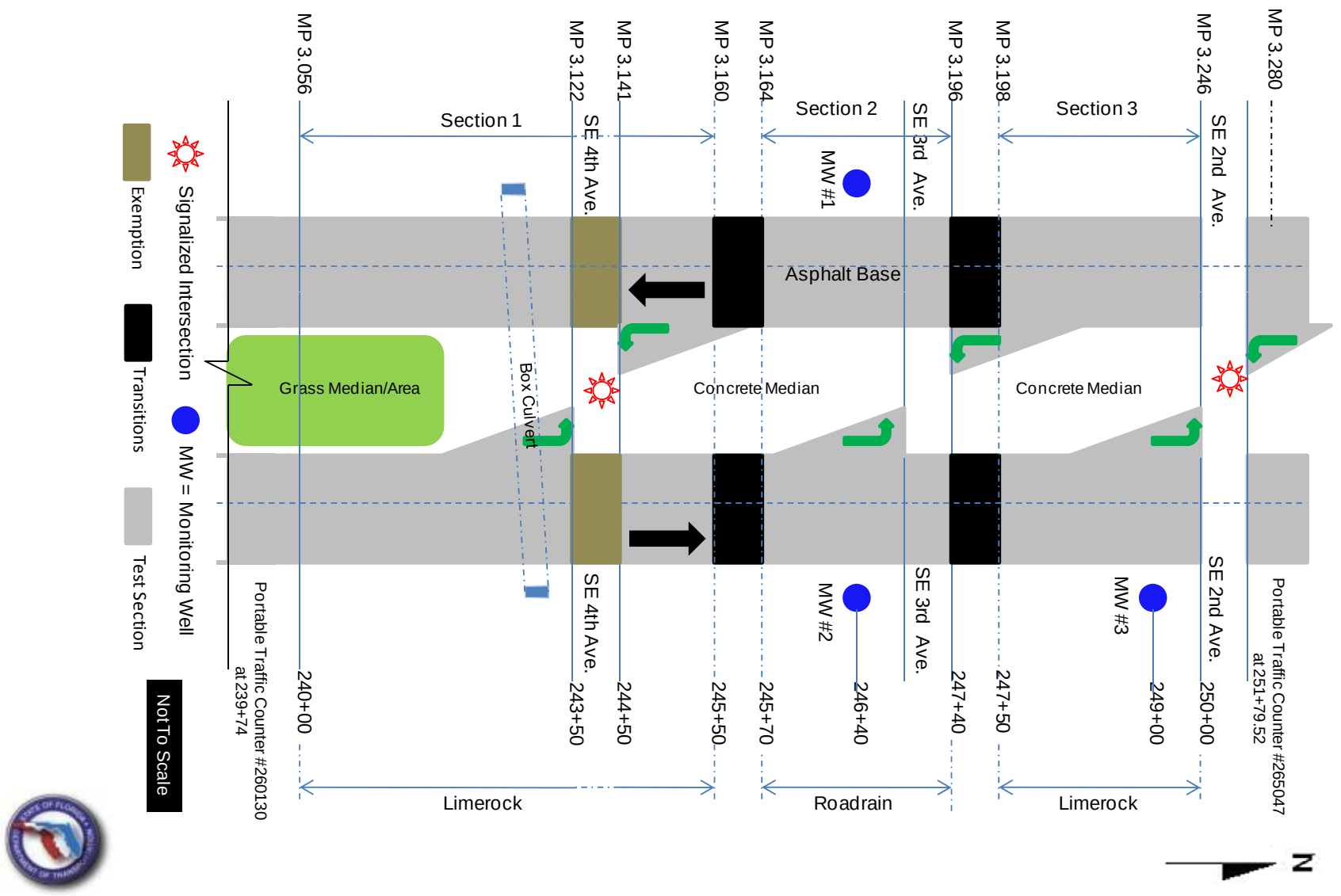
Performance Evaluation of a Geocomposite Drainage Layer and Black Base

October 2010

SR 331 (Alachua County)

- History of elevated water table
- Design and construction implications
  - ✓ Thicker pavement structure required (design resilient modulus reduced if base clearance < 3 ft)
  - ✓ Construction problems and additional costs likely
- Experimental sections constructed in 2005
- Objective
  - ✓ Evaluate the performance of a geocomposite and black base

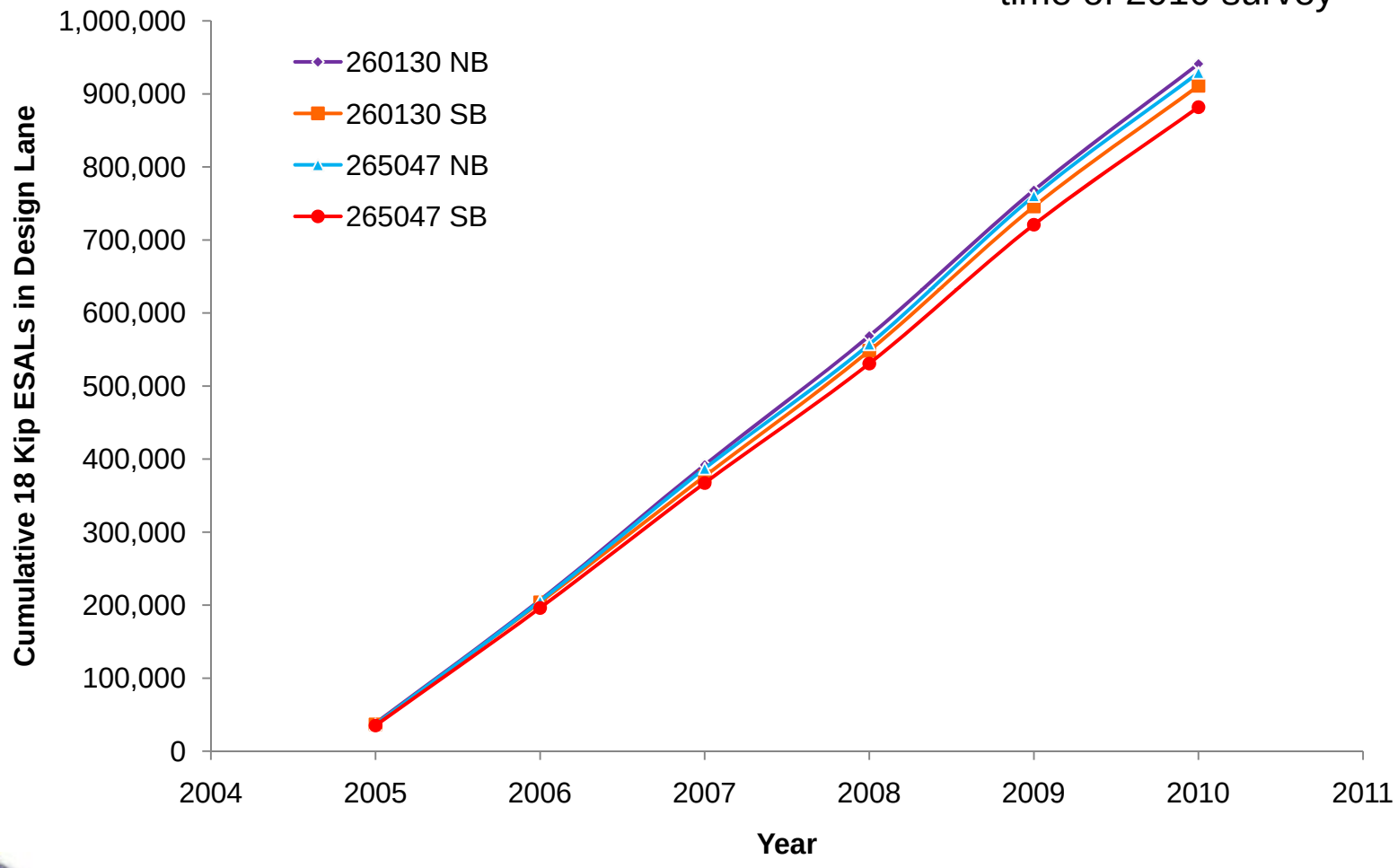
Test Sections



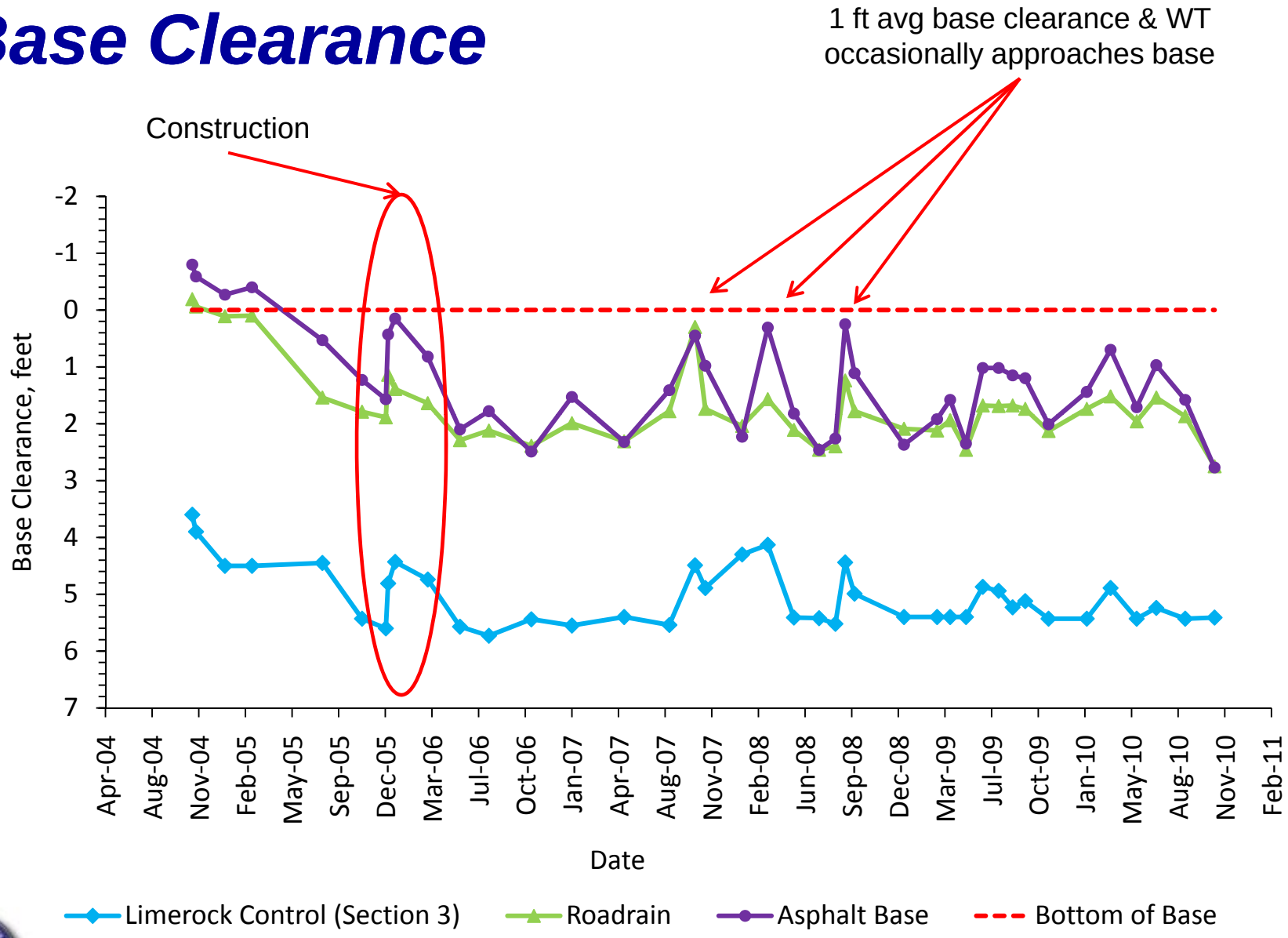
SR 331 (Southbound Passing Lane)

Traffic Data

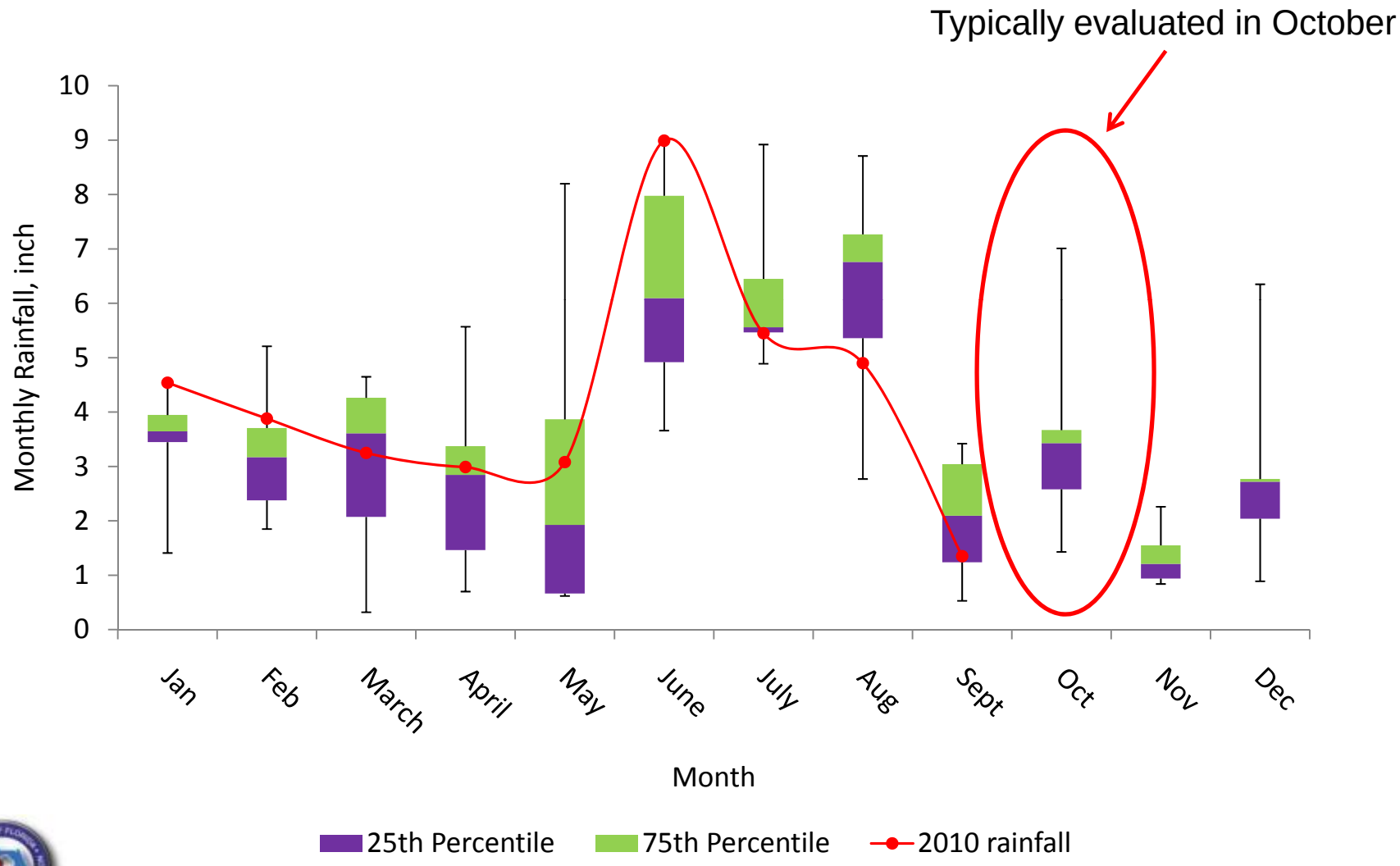
~1 million ESALs projected at time of 2010 survey



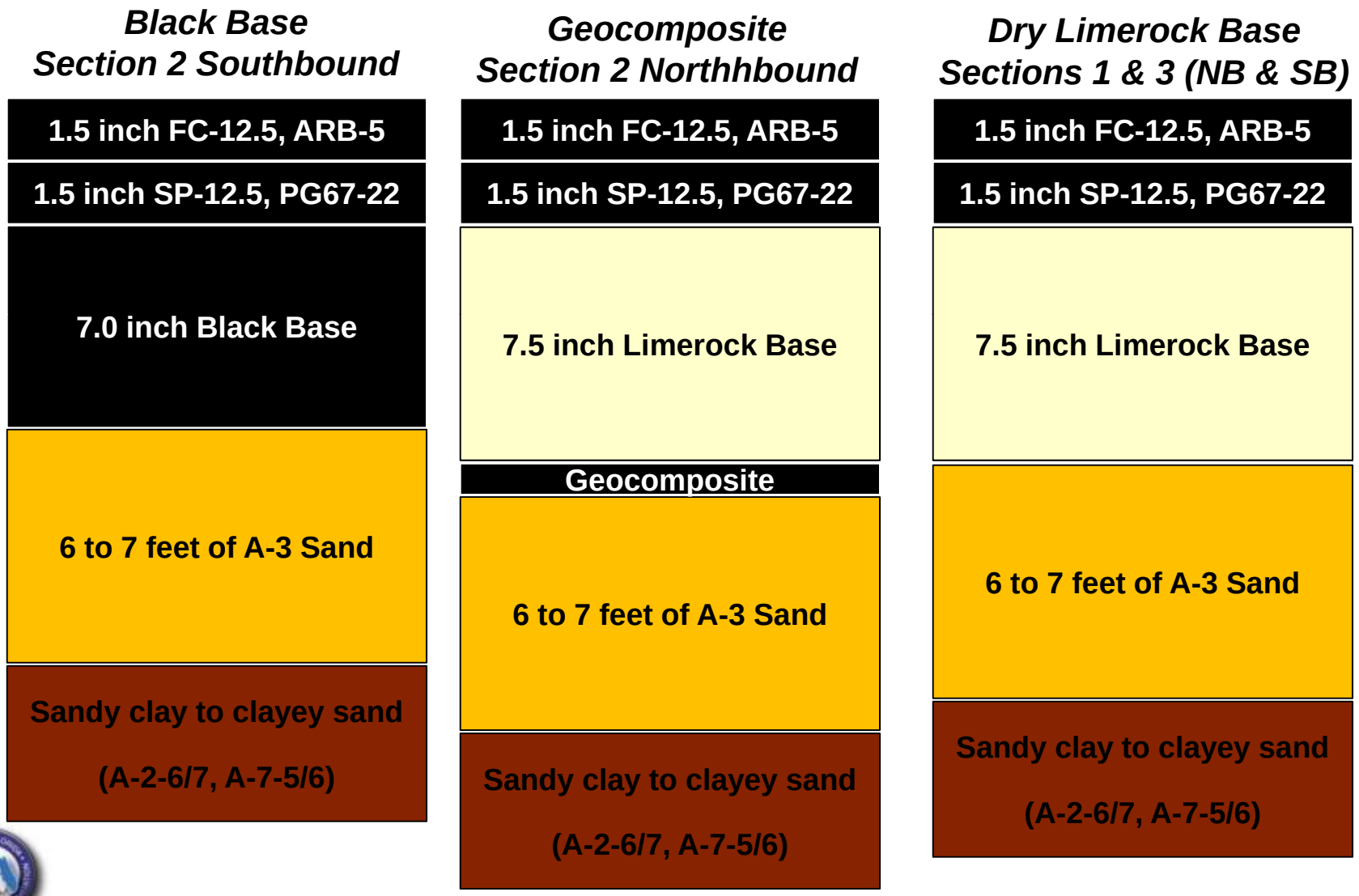
Base Clearance



Rainfall History

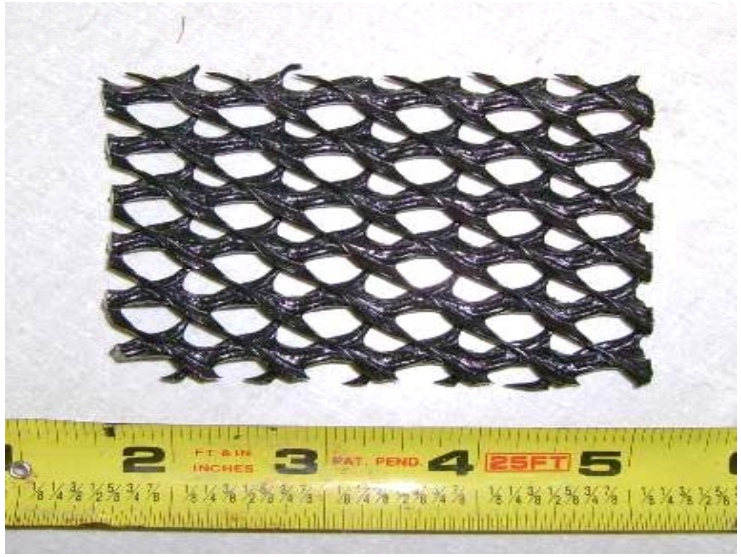


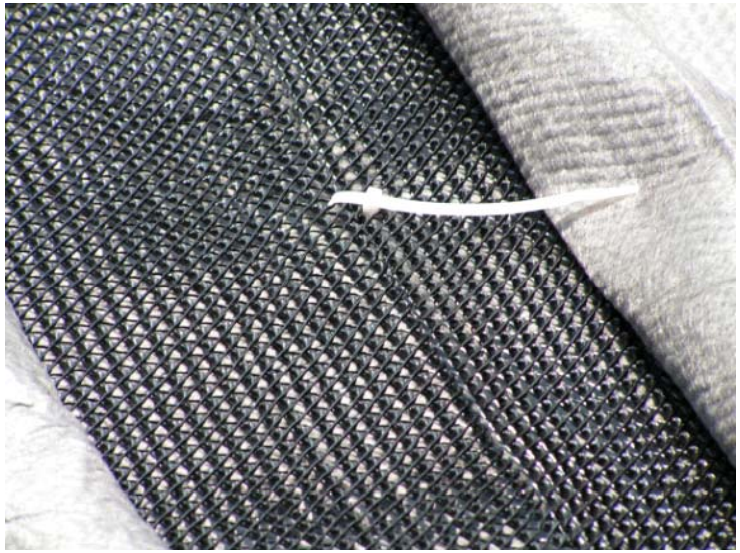
Pavement Sections



Geocomposite

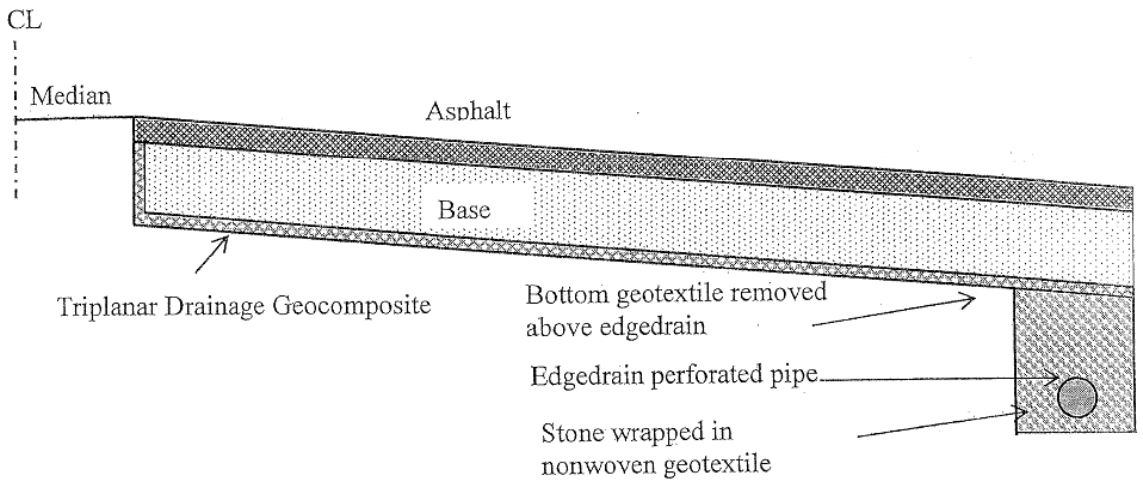
- High density polyethylene core
- Approximately 0.3 inches thick
- Aperture area 0.25 in^2
- Non-woven geotextile laminated to both sides





Technical Special Provision

- No track equipment allowed to travel directly over geocomposite
- A min of 6 inches of base required before heavy construction equipment allowed to travel over geocomposite
- Slope towards a Type II edgedrain (Index 286, Section 440)



Geocomposite Placement

Elevated Water Table During Construction

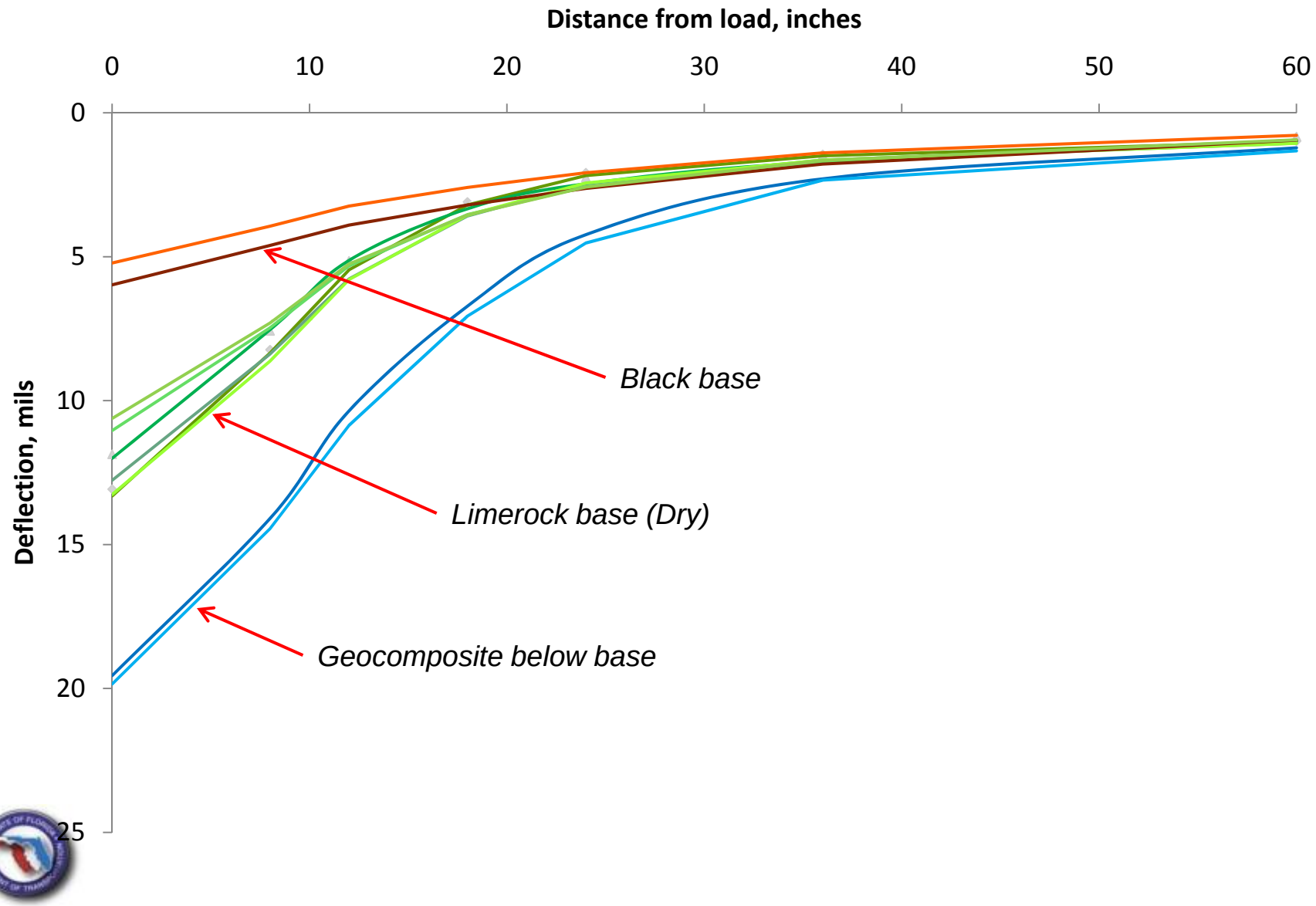
Pavement Performance

- Surveyed annually during October since 2005
- Performance measured in terms of
  - ✓ Ride
  - ✓ Rut
  - ✓ Deflection
  - ✓ Crack

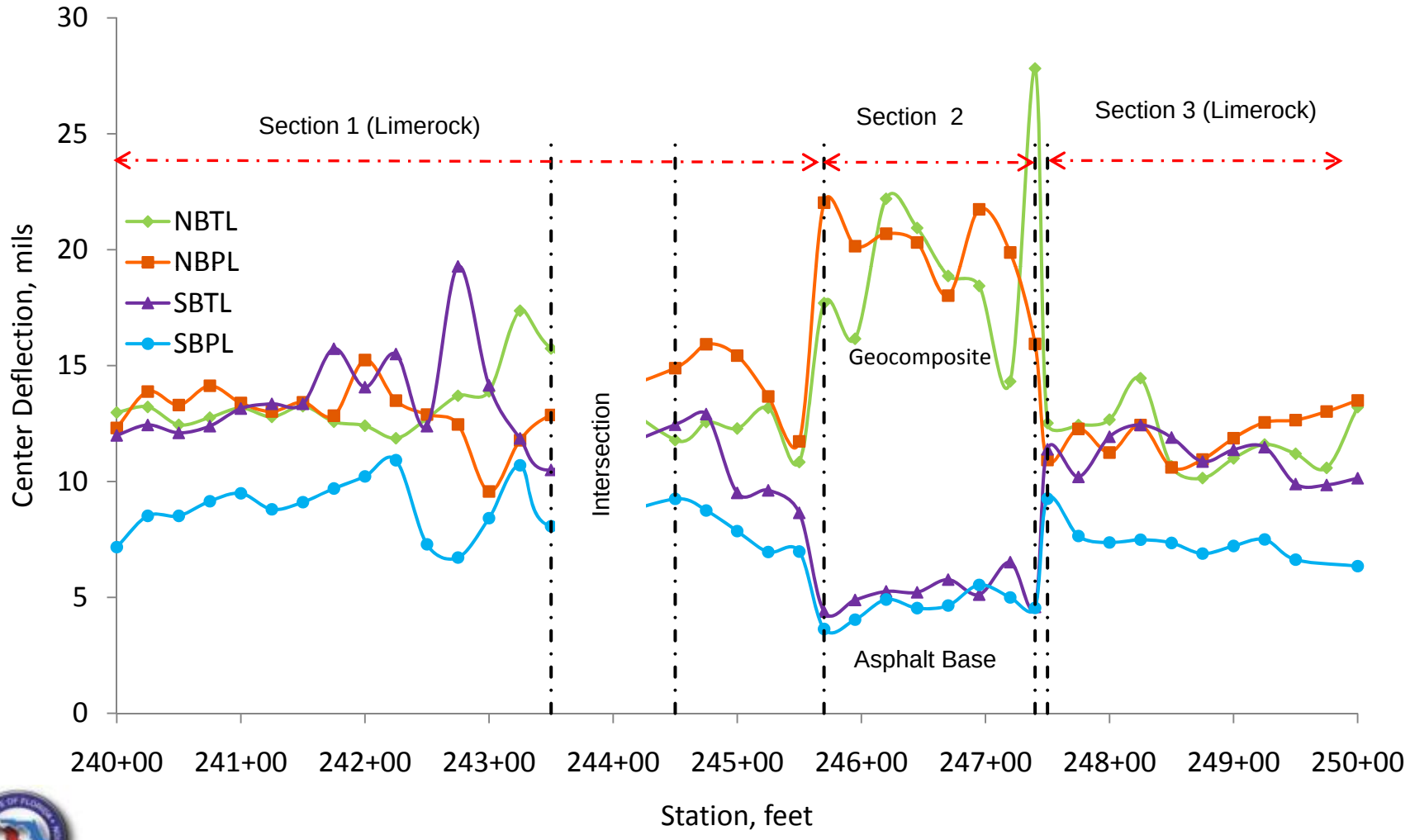
2010 Ride and Rut Measurements

- Ride quality is still good
  - ✓ Section 2 NBTL (Geocomposite) has a ride of 3.9
  - ✓ All other sections > 4.0
- Rut depth is acceptable and not significant between sections
  - ✓ The limerock control and black base have similar rut depths of 0.11 inch
  - ✓ The geocomposite section has a rut depth of 0.14 inch

2010 Average Deflection Basins

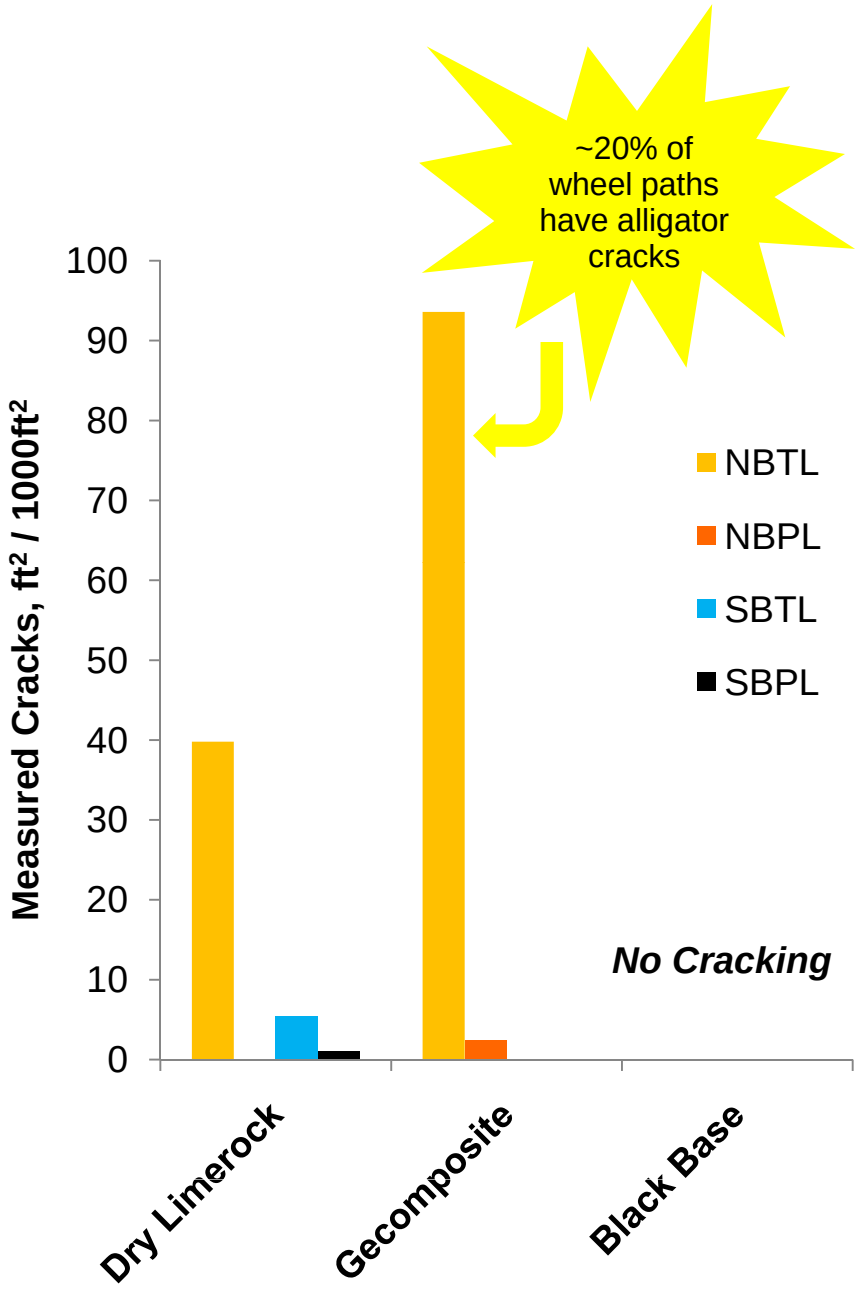


2010 Center Deflections



2010 Crack Survey

- The first crack was observed in the geocomposite section 3 years after construction
- The first crack was observed in the dry limerock section 4 years after construction
- No cracks have been observed in the black base section



Geocomposite Travel Lane

Pumping from cracks observed

Alligator cracks in wheel paths

Testing Summary

- Experimental sections are 5 years old
- Approximately 1 million ESALs have been applied
- The water table has penetrated the base occasionally over the 5 years of monitoring
- Annual monitoring will continue until further notice