Full-Scale Accelerated Pavement Tests
Geogrid Stabilization of Thin Asphalt Pavements

Tensar®

Research Organization

US Army Corps of Engineers
Engineer Research and Development Center

Sections Tested

2 inches (51 mm) HMA over 8 inches (203 mm) base (control)
3 inches (76 mm) HMA over 8 inches (203 mm) base (control)
2 inches (51 mm) HMA over 8 inches (203 mm) base over TX140

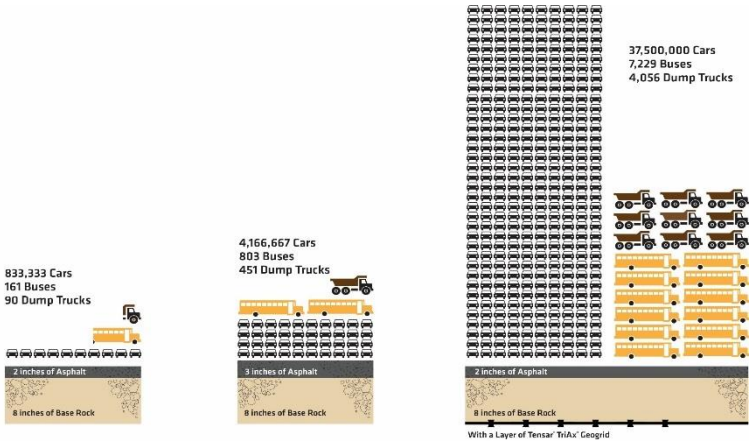
Testing Conducted

Thickness Validation & Material Characterization
Instrumentation of sections
Pavement Characterization (post construction)
HVS-A Traffic testing, FWD analysis
Post trafficking forensics (in-field CBR, rutting of layers,…)

Key Findings

Control sections rutted quicker than the TX140 stabilized section.

Pavement life of the TX140 stabilized section delivered over 18 times the traffic of the control section.



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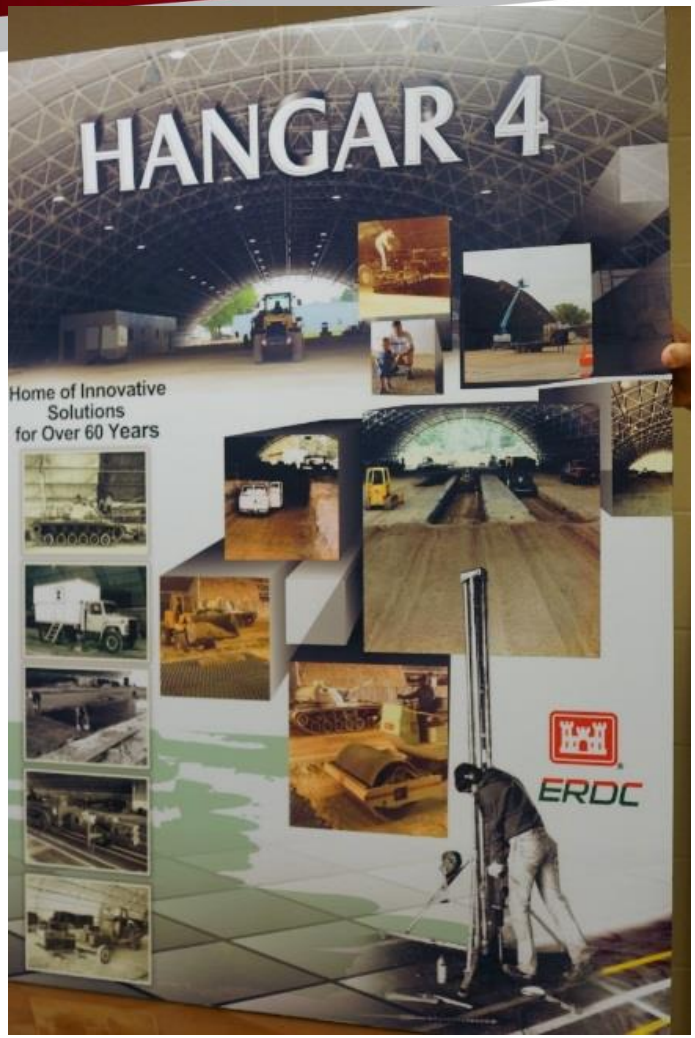

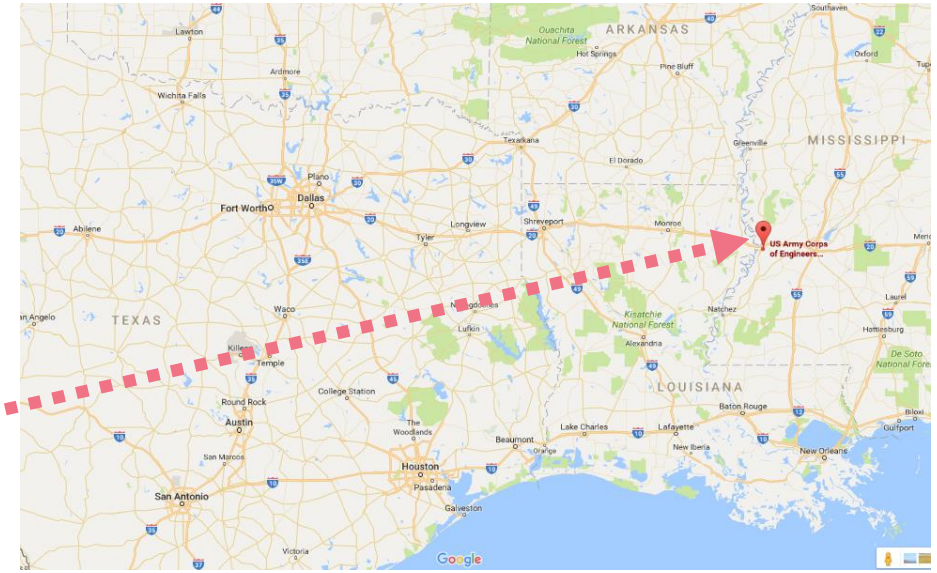

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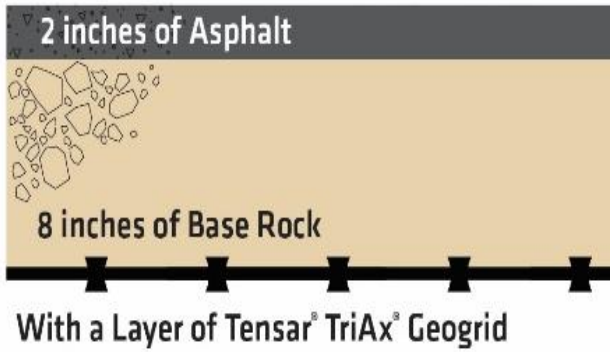
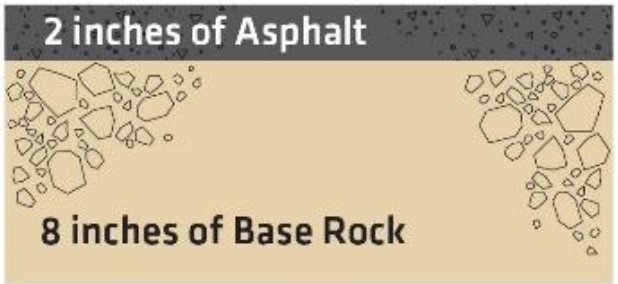
Stabilized with TriAx

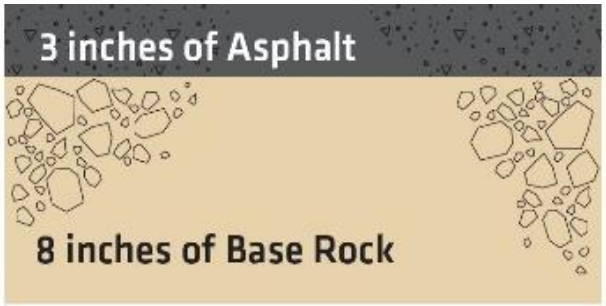


Report Item 1

Control Sections



Report Item 4



Report Item 5

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Test Plan and Section Layout

- Rural Collector Road (15% trucks consistent with a Category III roadway)
- 20 year performance period
- Subgrade CBR 3%
- Change in serviceability of 2.2 – suggested by AASHTO for lower volume roadways

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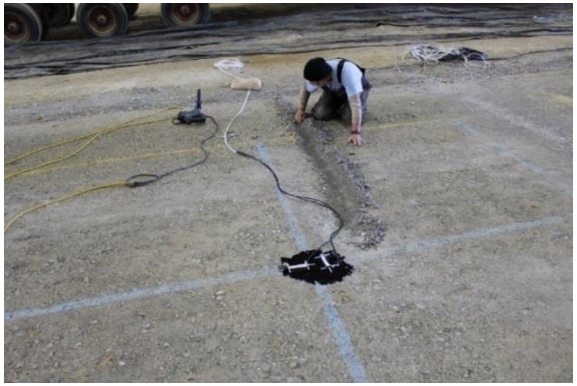

Significant procedures in place to reduce variability in testing (subgrade, base, asphalt, climatic impacts,…). APT testing is much more accurate than most field testing.

Click above to go to:
https://www.youtube.com/watch?v=LIXcj9uqHlU

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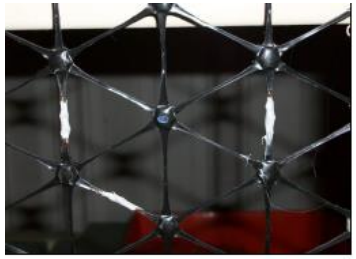
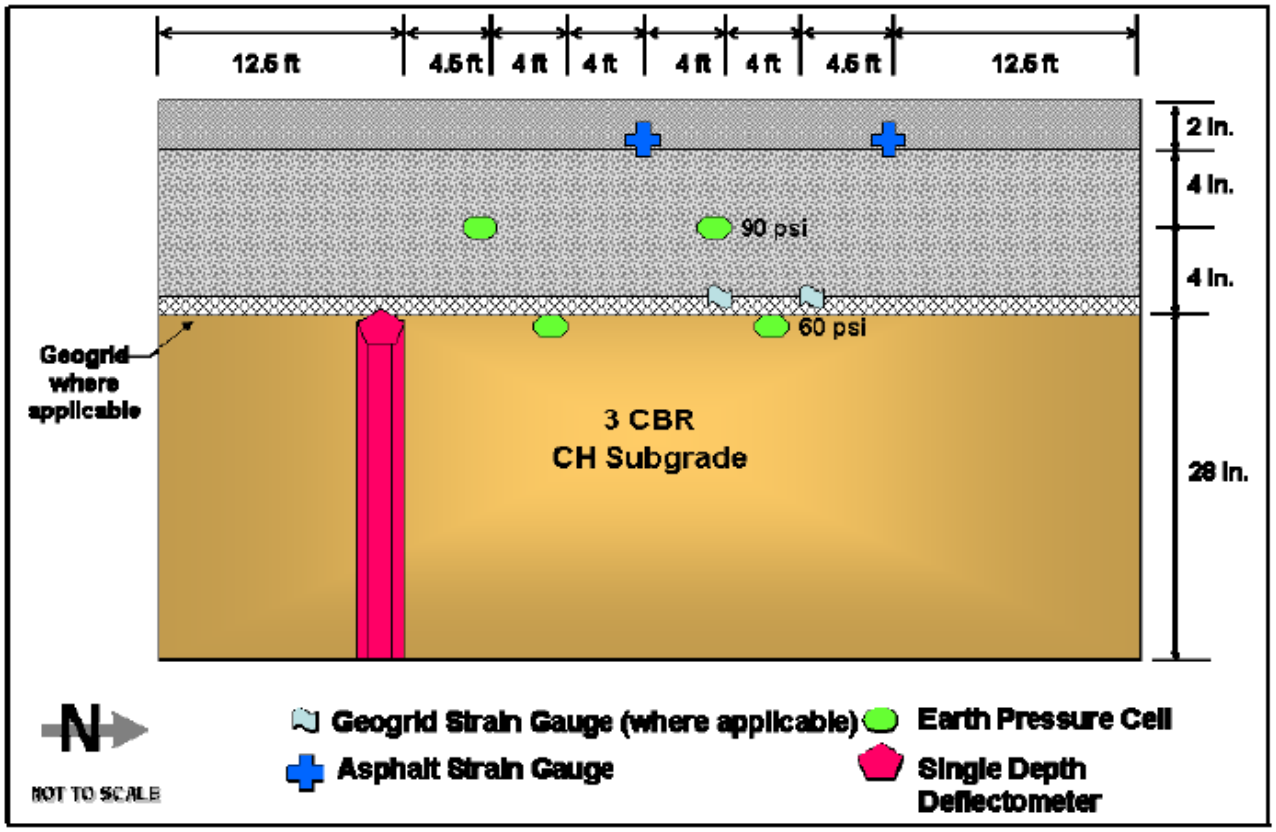
Instrumentation/Dynamic Sensors





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Heavy Vehicle Simulator (HVS-A). Capable of applying loads between 10,000 and 100,000 lbs.

Uniformly distributed traffic load with typical wander introduced.

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Falling Weight Deflectometer

- Tests performed pre-traffic, during trafficking and post trafficking
- Impulse Stiffness Modulus (ISM) values were calculated to determine if the base was stress weakening or hardening.

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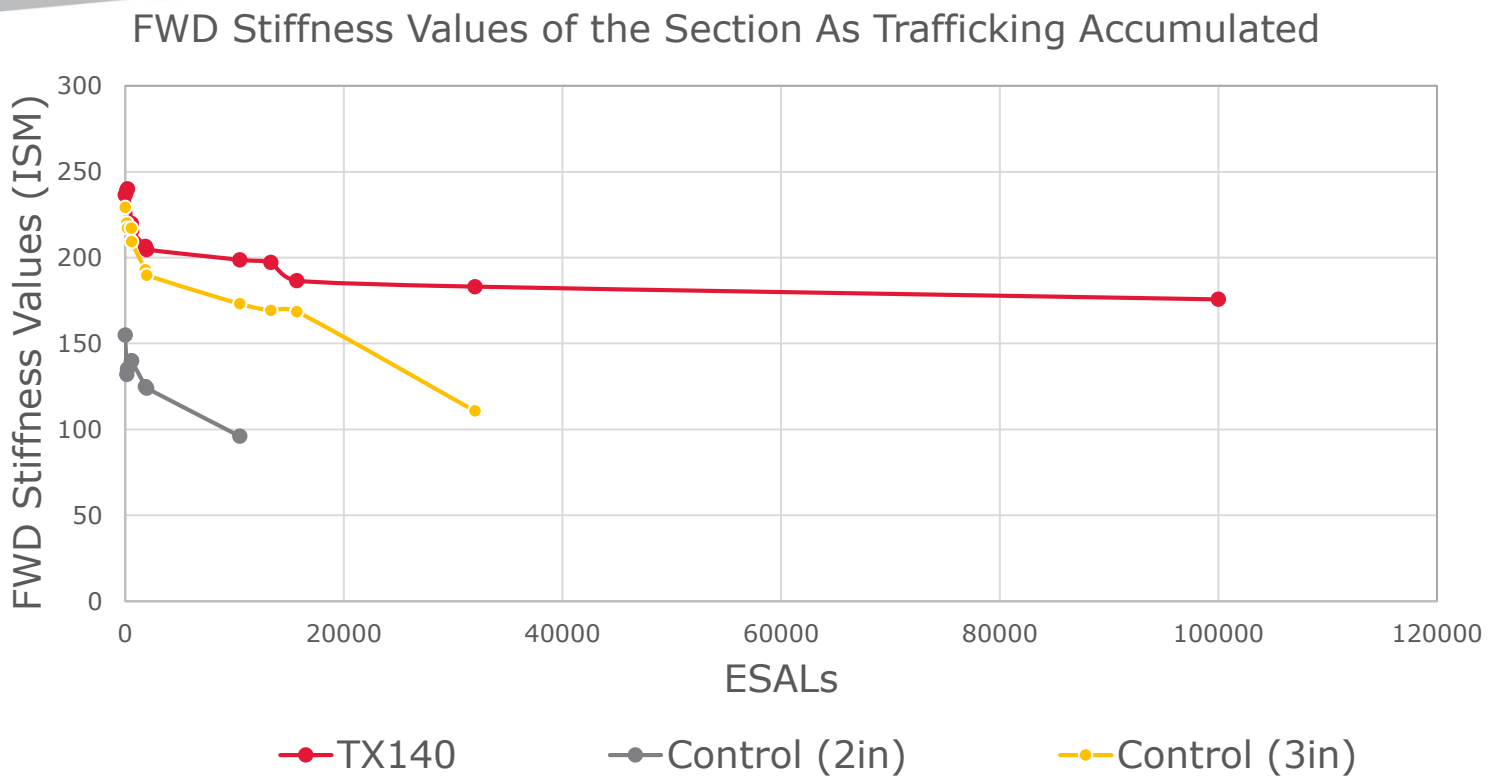

*"This is evidence that the geogrid reinforcement (TriAx TX140) **not only provided enhanced stiffness** to the aggregate base during construction, **it also maintained the stiffness of the aggregate base** throughout trafficking to the levels tested in this study. "*

--Corps of Engineers pg. 37

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Control

TX Stabilized

Rutting

- Measured at 5 locations along each test item
- Measurements taken at selected trafficking intervals
- Rutting occurred quicker in the unstabilized sections.

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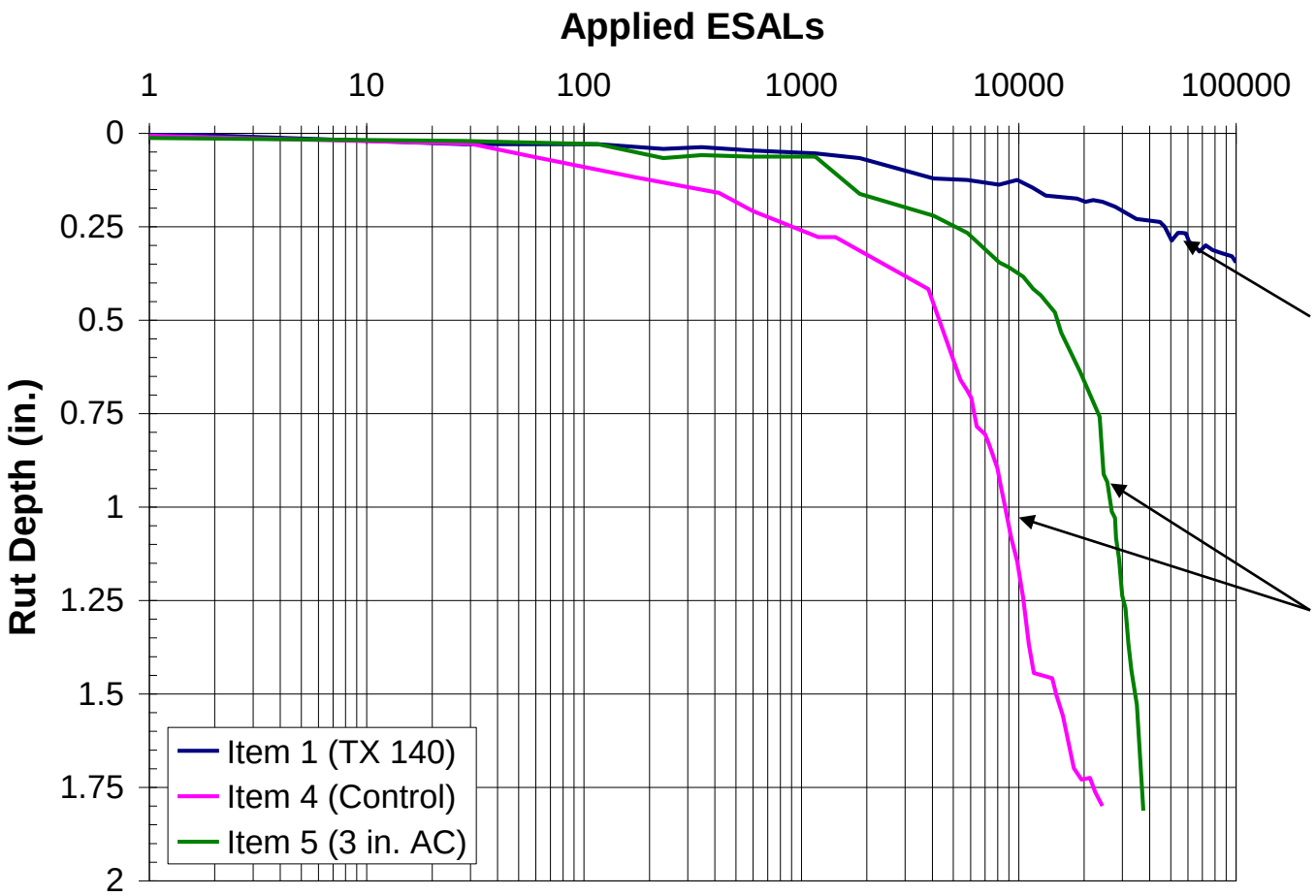

Rutting increases much slower with TriAx

Rutting increases rapidly

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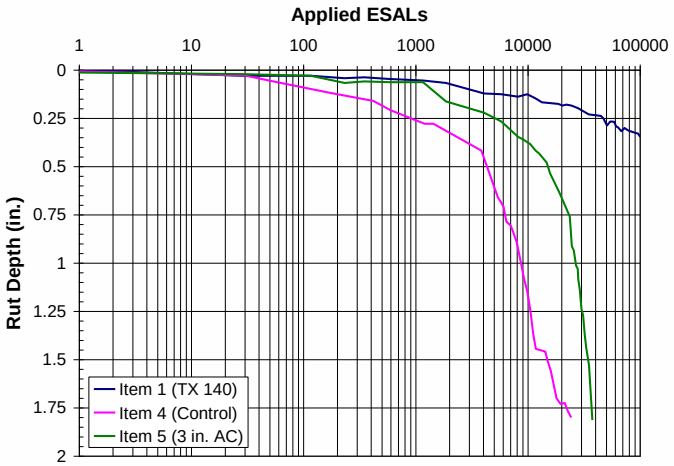
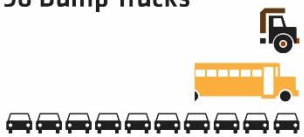
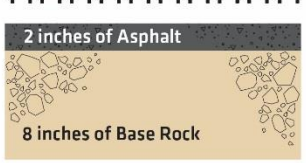
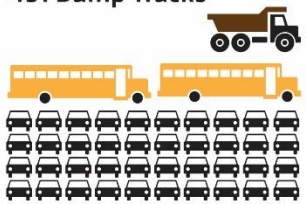


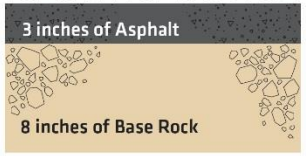
833,333 Cars
161 Buses
90 Dump Trucks



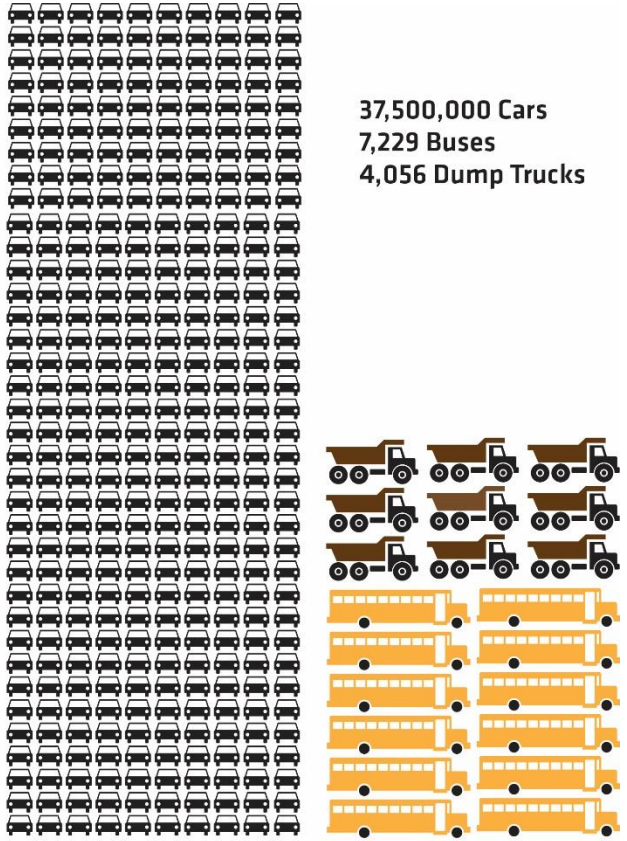


4,166,667 Cars
803 Buses
451 Dump Trucks





37,500,000 Cars
7,229 Buses
4,056 Dump Trucks



With a Layer of Tensar® TriAx® Geogrid

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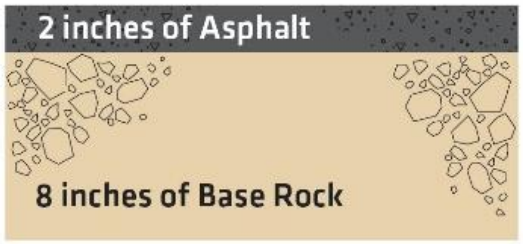
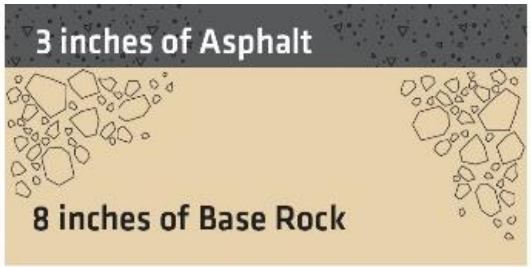
Summary of Testing

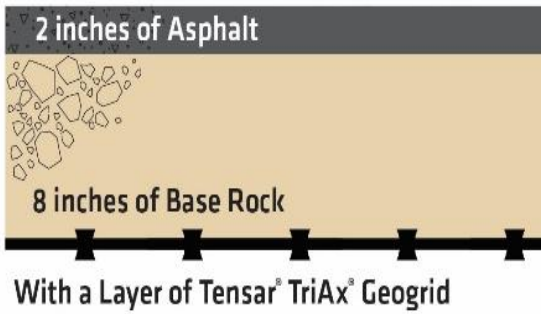
- Tensar TriAx stabilized base can significantly improve the performance of a pavement by maintaining stiffness of a pavement section and reducing rutting at the surface.
- At rutting levels of 0.25-0.5 inches, sections stabilized with Tensar TriAx provided over 18 times that of the control, and over 7 times that of adding an extra inch of asphalt.



5,400 passes



12,640 passes



100,000+ passes