



# *Bonded Concrete Overlay of Asphalt – Urban Pavement Rehab Solutions*

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# Design & construction protocols – concrete over asphalt

- Sometimes referred to as “whitetopping”
- Additional descriptive terms:
  - ▶ Conventional, thin, ultra-thin (UTW)
  - ▶ Based on level of bond, load carrying
- Original “whitetopping” was essentially designed as new concrete pavement with no focus on bond
- *Bonded Concrete Overlay of Asphalt (BCOA):*
  - ▶ Measures taken to provide bond
  - ▶ Concrete may or may not contribute significantly to load-carrying capacity but significantly enhances surface durability, thus pavement life
  - ▶ Often an inlay configuration

## References & technical resources

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- CPTech Center, “Guide to Concrete Overlays of Asphalt Parking Lots”, Harrington and Riley, 2012
- CPTech Center, “Guide to Concrete Overlays”, Harrington, et al. 2008
- ACI 325.13R-06, “Concrete Overlays for Pavement Rehabilitation”
- ACPA, “Whitetopping – State of the Practice”, EB210P

# “Conventional whitetopping” example

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**Before**



**After**



*Bone of concrete to asphalt is relatively unimportant when overlay design is essentially that of an independent pavement on an improved subbase.*



# “Conventional whitetopping”

- First documented use, 1926

## Resurfacing An Old Pavement With Concrete

Data supplied through courtesy of Ernest Altekruze, County Superintendent of Roads, Vigo County, Terre Haute, Ind.



South Seventh Street Road, Terre Haute, Ind., showing condition of concrete resurfacing after 8 years' service.

*This pamphlet with the title above was first printed in 1921. Many miles of old base have been resurfaced with concrete since that date. South Seventh Street in Terre Haute is giving the same good service in 1926 that it did in 1921.*

Published by  
**Portland Cement Association**

# Examples of whitetopping (little attention to bond)



## **Benefits – concrete overlay of deteriorated asphalt**

- Saves expense of removing the asphalt, making productive use of the materials (more sustainable!)
- Economical way to enhance pavement capacity for expansion projects or change of traffic level
- Reduction of maintenance expenses accomplished via needed rehab
- Better safety & illumination with less energy
- Aesthetics & curb appeal



# So, what's different about *BCOA*?

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- Typical applications are problem areas of extreme, rapid asphalt surface disruption under heavy traffic (rutting, etc.)
  - ▶ Intersections – most common
- Most projects rely on the existing asphalt pavement structure for most or all of the load-carrying contribution
- Concrete: new, durable wearing surface, ending frequent rehab cycles
- Concrete-to-asphalt bond generally allows for thinner concrete layers than in conventional whitetopping
  - ▶ Close joint spacings are needed to prevent debonding from panel curl & shrinkage
- Synthetic fibers common @ high dosage
- Many projects are designed for fast-track construction & rapid opening to traffic
- Economic justification usually based on less frequent maintenance requirements





# BCOA construction

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- Planning & traffic control
- Milling / inlay prep
- Cleaning of surface for bond
- Traditional placement / finishing
- Rapid joint sawing
- Accelerated curing
- Often: opening to traffic in 24-48 hours, immediate sequencing of adjacent lane placements





# Milling and cleaning – critical for bond



# **Milling and cleaning – critical for bond**

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# Lots of joints to cut





# Immediate, effective curing

Insulated curing blankets may be needed, seasonally



# Projects



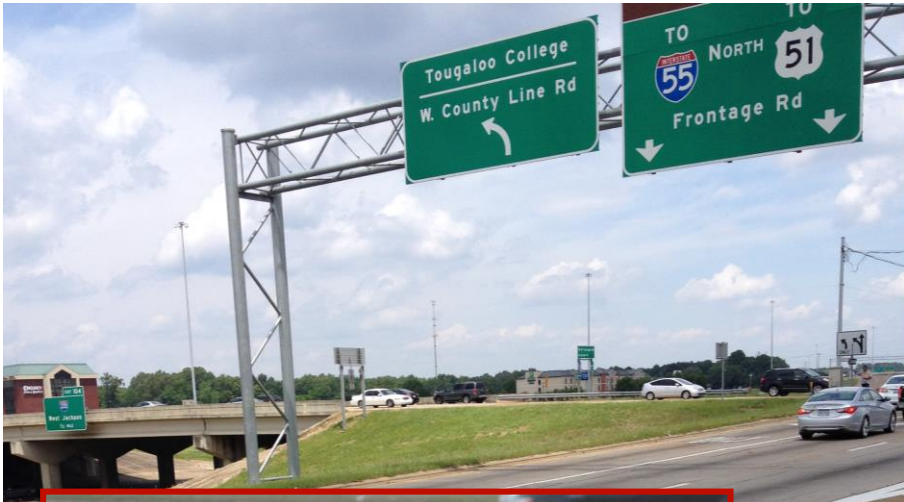
# First project in Mississippi - frontage road intersection, I-55 @ County Line Road, Jackson MS – October, 1996





*Projects*

# County Line Rd @ 20 years





**Projects**

**Other MDOT projects**



**Collinsville**



**Hattiesburg**



**Newton**



**Carthage**



**Macon**



# US 78 Intersections at Memphis





# South Pittsburg, TN

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*Projects*

# Main Street – Jasper, TN

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# Savannah, TN

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*General aviation  
airport runway*



# New Orleans French Quarter BCOA



CITY OF NEW ORLEANS

- Cooperative Endeavor Agreement between the City and Convention Center – \$6.5 million
  - ▶ Downtown Infrastructure Improvement Project
- City Council approval of budget - June, 2013

Project and Scope of Work		Project Cost Estimate
Intersection of Julia St. / Convention Center Blvd.	Intersection enhancement; decorative plaza	<b>\$3,851,000</b>
Julia St.	Convention Center to Loyola - White topping	
Iberville St.	North Rampart to North Peters- White topping and drainage point repairs	
Regional Planning Commission/City Match \$2.5 million investment	S. Peters (Calliope to Canal) Baronne (Canal to Calliope)	
French Quarter Lighting	Dauphine/Canal/Decatur/Dumaine	\$1,000,000
Drainage	Limited point repairs to improve drainage– French Quarter and Central Business District	\$500,000
Signage / Striping	Street signs and striping cross walks	\$100,000
Sanitation	Improvements to sanitation services to be used over a 2-year period including new bins and enhanced operations	\$1,000,000
<b>TOTAL INVESTMENT</b>		<b>\$6,451,000</b>



# Iberville & Julia streets – conditions prior

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## Projects

# Iberville & Julia streets – construction





*Projects*

# Iberville & Julia streets

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# US 78 EB weigh station at Olive Branch, MS, 1999

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# US 78 EB weigh station at Olive Branch, MS

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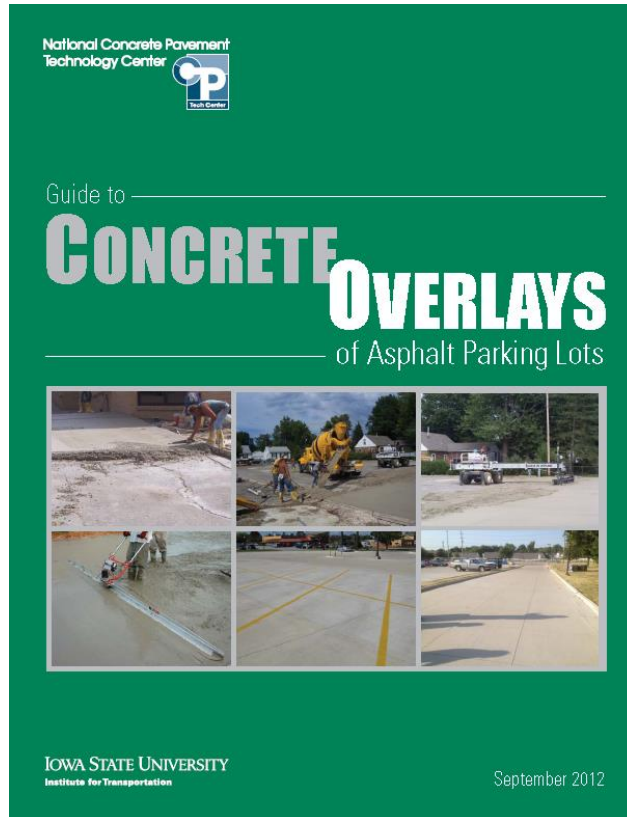


# US 78 EB weigh station at Olive Branch, MS





# Parking lot overlay guide for designers and contractors



- How to evaluate existing asphalt
- Determining overlay thickness based on 3 different zones.
  - ▶ Car parking area
  - ▶ Access roads
  - ▶ Heavy duty truck Lanes
- Surface preparation
- Placement procedures and tools
- Joint layout guidelines
- Supplemental information for determining use fibers and dowels

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***Questions?***



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