



## Local Roads and Streets - Concrete Overlay Performance Review 2018

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Joslyn Road – Oakland County 2014



Ann Arbor Rd/I94 – Washtenaw County 2014

## Thin Concrete Overlays

### Two Main Types Built in Michigan

- Resurfacing or Whitetopping – on asphalt base, 4 inch or less
- Composite – on concrete base with separator layer. 4, 5 and 6 inches



## Concrete Resurfacing or Whitetopping

- Dozens of projects predominantly located in West Michigan starting in 1996
- Typically 4 inches or less on asphalt base

## Thin Composite Concrete Overlays

- Dozens of projects predominantly located in SE Michigan starting in 1983
- Majority are 4 inches or less, several 5 inches, several 6 inches, on concrete base
- All have 1 inch asphalt separator, except one (Little Mack) has fabric separator

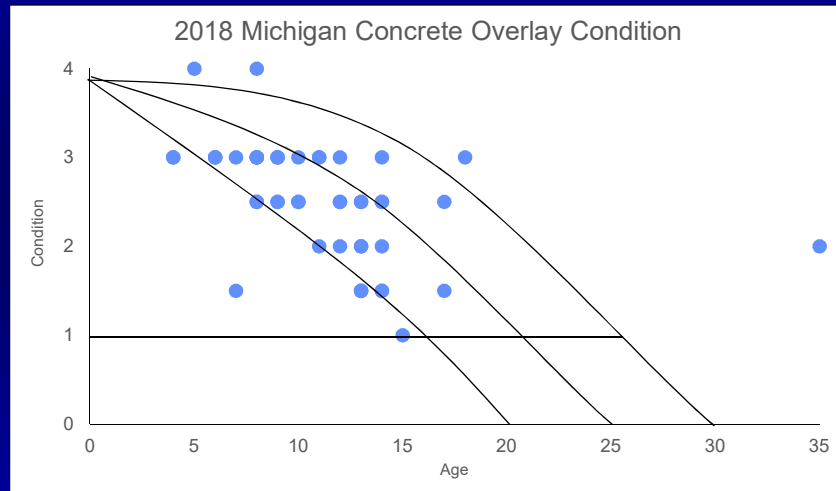


## Thin Concrete Overlays Performance Review 2018

- 48 projects were visited and evaluated by MCA staff.
- Key observations were made:
  - Overall Condition (poor, fair, good, excellent)
  - Overall Ride Quality (poor, fair, good, excellent)
  - Joint Condition
  - Cracks/Corner Cracks
  - Shattered Slabs
  - Shifting Slabs
  - Faulting Slabs
  - Visible Material Related Distress (MRD)



# Overlay Performance



4 = Excellent    3 = Good    2 = Fair    1 = Poor



## Patterson Ave., M-37 to Burton St., Kent County

- 4 in. nominal thickness on 6 in. of HMA
- 4.1 miles long; 4 different construction projects
- 5 lanes (2 ea. way, 1 center turn)
- ~144,000 sq. yds. total
- Built 2006-09
- 9 to 12 years old in 2018



## Patterson Ave., M-37 to Burton St., Kent County

### Key Findings

- Repairs performed in 2016
  - Less than 3% of total original area
  - Added expansion joints; Some blowups / breakup due to shifting slabs from **unsealed joints**



## Patterson Ave., M-37 to Burton St., Kent County

### Key Findings

- No materials-related distress – SCM's!!
  - 3 of 4 projects used optimized aggregate blends along with slag cement; 1 used fly ash



## Zeeb Road, Jackson Rd. to Park Rd. Ann Arbor

- 6 inch nominal thickness, with dowels
- 5 lanes, 3 lanes of overlay, 2 full depth concrete
- Transverse joint spacing 12 ft.
- Sealed joints
- SCMs
- Built 2000 (18 yrs)



## Zeeb Road, Jackson Rd. to Park Rd. Ann Arbor

### Key Findings

- Overall Good condition, good ride.
- Few visible corner cracks and longitudinal cracks on south end
- Some light staining/shadowing visible near cracks.
- 2015 some full depth joint repairs as well as repairs done at intersection of transverse and longitudinal joints.
- Lots of trucks!



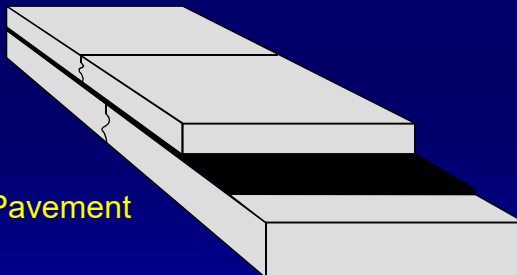
## Zeeb Road, Jackson Rd. to Park Rd. Ann Arbor, 2018



## Thin Concrete Overlay of Existing Concrete Pavements

New Concrete Overlay  
Asphalt Separator Layer

Old Concrete Pavement



## South Blvd., MLK to Opdyke, Pontiac

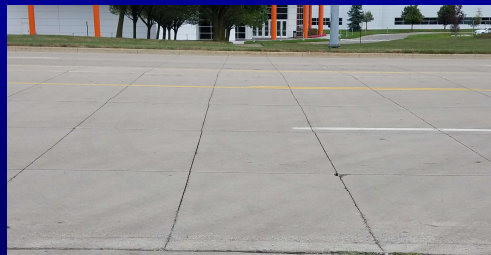
- 4 inch overlay, 1 inch asphalt separator
- 6 ft x 6 ft panels, sealed joints
- P1 Mod, well graded mix
- Slag cement
- Asphalt separator layer placed in fall of 2008, concrete placed in spring of 2009.
- Existing pavement added lanes



## South Blvd., MLK to Opdyke, Pontiac

### Key Findings

- Overall fair to good condition
- Poor to fair ride due to faulting and shifting panels.
- Several areas throughout project shattered slabs are visible
- Several blow ups have occurred on this pavement and full depth repairs done, expansion joint established.
- Visible chipping of joint saw cut in many areas.
- No MRD visible



## South Blvd., MLK to Opdyke, Pontiac



## South Blvd., MLK to Opdyke, Pontiac 2018



## Thin Concrete Overlays Summary Resurfacing (Whitetopping) Projects

- Sealed joints
- Shifting panels
- Expansion joints at wide thermal cracks
- Cracking due to thin section
- No MRD visible with SCMs



## Thin Concrete Overlays Summary Composite Projects

- Expansion joints needed in overlay where original pavement has an expansion joint or where there is visible movement in original pavement.
- SCMs are key to addressing MRD issues due to ASR or freeze thaw durability.
- Full depth repairs may be needed in existing concrete that is in poor condition or has base/subgrade issues.



## Thin Concrete Overlays Summary Composite Projects, Cont.

- Shifting of slabs is more prevalent in the thinner, < 4 inch composite sections.
- Little shifting is visible in the 4 inch composite with fabric, but only one project to-date.
- Sealed joints seem to be performing better, less raveling, better ride.
- Fibers assist with keeping cracked panels in tact.
- > 5 inch overlays overall performance good to excellent.

