Maintaining Traffic for Concrete Paving in Michigan

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Michigan Concrete Association
October 11, 2022

Maintaining Traffic for Concrete Paving Projects

- Many different options, combinations
  - One size does NOT fit all
  - Tailor to your project
  - Other items often dictate option (bridge, underground, utilities, ROW, etc.)
- Partnering critical
  - Allow flexibility
  - Allow contractor to propose options
- Safety **must** remain #1 priority

Major Factors…

- **Setting Expectations**
  - Communication
  - Public information programs
  - Social Media
- **Accelerating Construction/Fast Track**
  - Planning and contracting
  - Appropriate concrete mixtures, and construction
  - Curing and temperature management
  - Appropriate opening to traffic criteria – maturity.


Michigan Department of Transportation
newsroom

UPDATED with map...

Grand Rapids- See map & project info below.

Eastbound I-96 is scheduled to close at M-6 this Saturday from 8 a.m. to 1 p.m. Traffic will be detoured to westbound M-6 and then exit at M-37 to take eastbound M-6 back to eastbound I-96.

EB I-96 to WB M-6 then exit at M-37 to re-enter M-6 east to EB I-96

The work is weather dependent.

Sign up for email from MDOT: http://bit.ly/1AuvtY2

Follow MDOT's Grand Region on Twitter at www.twitter.com/MDOT_West

For up-to-date information on this project and others, go to the list of statewide lane closures at: www.michigan.gov/drive.

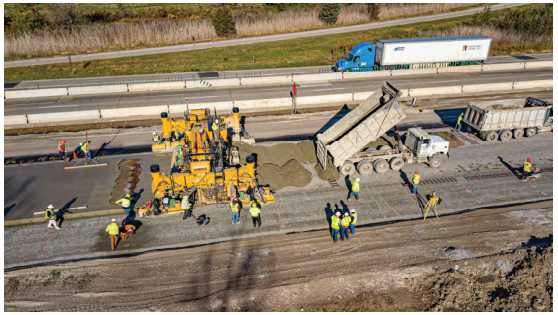
Follow MDOT at www.twitter.com/MichiganDOT or www.facebook.com/MichiganDOT

John Richard Michigan Department of Transportation Communications Representative Grand Region 1420 Front Avenue, NW Grand Rapids, Mi 49504 Cell: 616.262.1565 E-mail: richardj2@michigan.gov

Options Used in Michigan to Manage Traffic for Concrete Paving

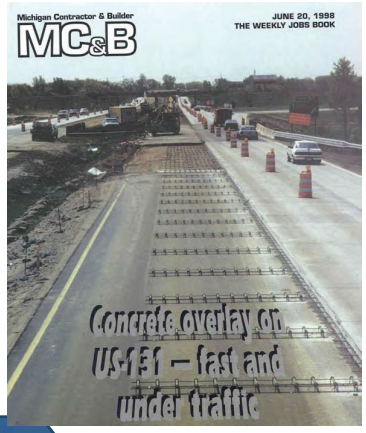
[Strategies are often combined with each other]

- Use of shoulder / lane shift
- Lane closures
- Temporary widening + lane shift
- Crossovers to other side
- Split-merge
- Moveable barrier
- Half closure & detour
- Total closure & detour



Lane Closures only: US-131 Concrete Overlay

- 4.5 miles divided highway
- Concrete Overlay - All Lanes + Shoulders
- Completed in 44 days
- Summer 1998



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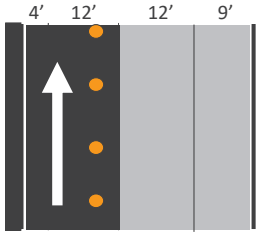
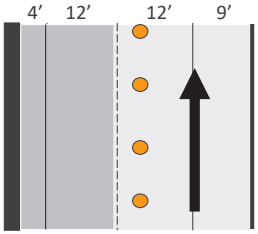


Stage I

- Prepare Shoulders
- Place AC Interlayer
- Take Outside Lane & Shoulder
- Pave Concrete Overlay
- Open to Traffic



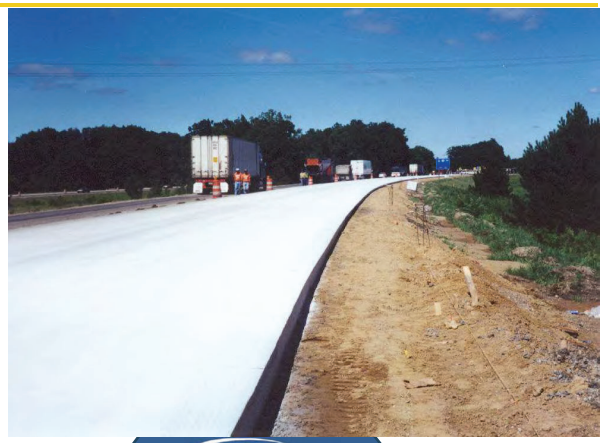
Stage II

- Take Inside Lane & Shoulder
- Pave Concrete Overlay
- Open to Traffic

US-23 Concrete Overlay (1999)

I-69 Overlay (2000)

I-69 Overlay (2000)



Issues to Consider

- Potential interference between traffic & workers & paving equipment
- Construction traffic utilizing the same space as public traffic
  - Batch truck movements in and out of traffic
- Potential traffic rollovers due to soft edge beyond pavement
- Ride quality …. Possibly harder to obtain better numbers
- Conflicts between paving operation and traffic
- Much more time for traffic to get through project (while paving)
- Basic safety concerns

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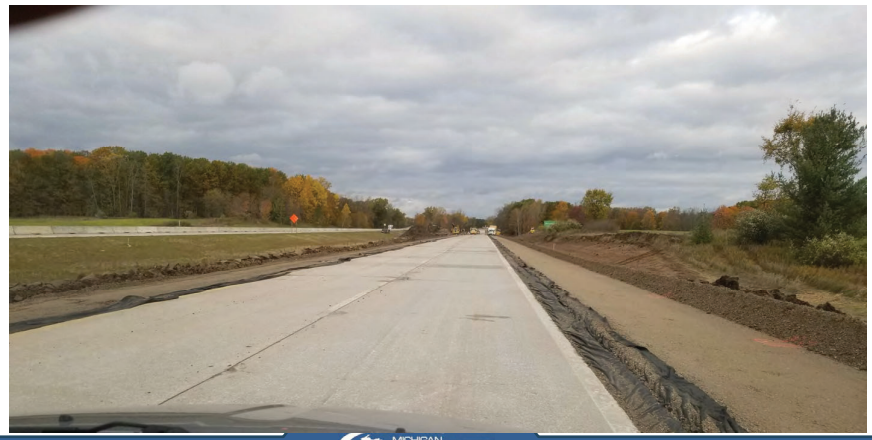
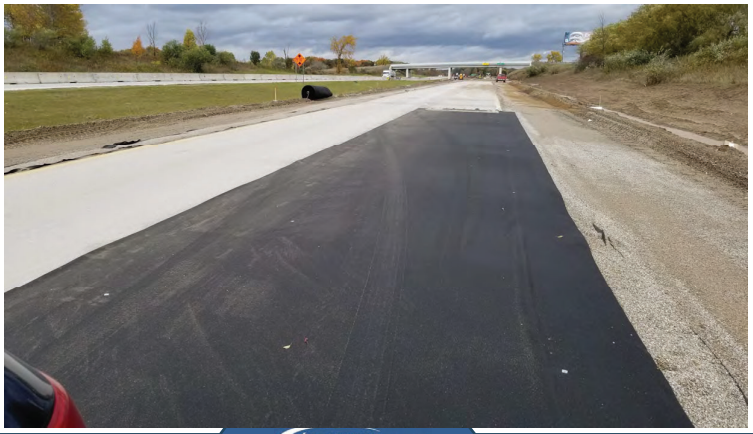
Lane Closures + Crossovers

US-10 Unbonded Concrete Overlay, 2013
Midland / Isabella Co. line east to M-18
Coleman, Mich.

Lane Closures + Crossovers: US-10, Clare



Lane Closures + Crossovers: US-10, Clare



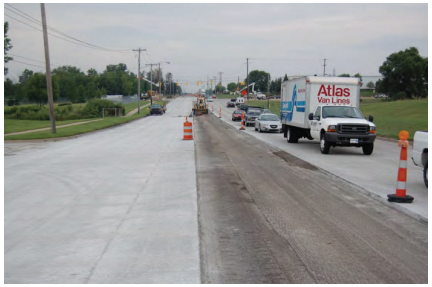
Lane Closures + Crossovers: US-10, Clare

Lane Closures + Crossovers – Urban Arterial

- Patterson Avenue, Kent County, MI
- 5-lane arterial
- 4-inch bonded concrete overlay (whitetopping)
- 1 lane each direction during construction with no left turns allowed
- 3 phases (outer 2 lanes, other outer 2 lanes, then center turn lane)

Lane Closures + Crossovers – Urban Arterial

Lane Closures + Crossovers – Urban Arterial



Quadrants for Intersections

- Lane closures + crossovers
- Typically requires 2 main phases and 2 sub-phases to get all 4 quadrants

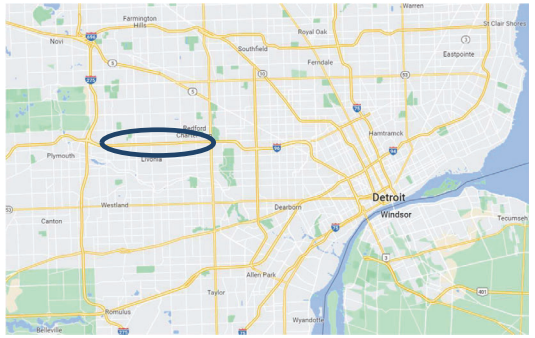
Half Closure + Detour

- I-275 Pavement Replacement, 2016
- 500,000 syds of concrete replaced in one construction season
  - May 2 to August 31
- 200,000 vpd
- Detour routes available

Full Closure + Detour

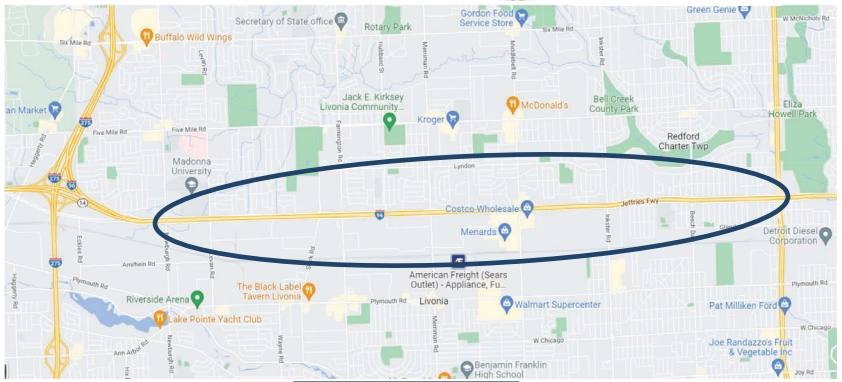
INTERSTATE 96 *fixed*

- 7 miles of below-grade freeway in suburbs of Detroit
- 140,000-163,000 ADT
- 40-year-old concrete/composite
- 7 interchanges, 37 bridges
- 700,000 SY concrete pavement
- $148M in 167 days
- Partnering, multiple innovations
- **Stakeholder Engagement**



Full Closure + Detour

I-96 fixed



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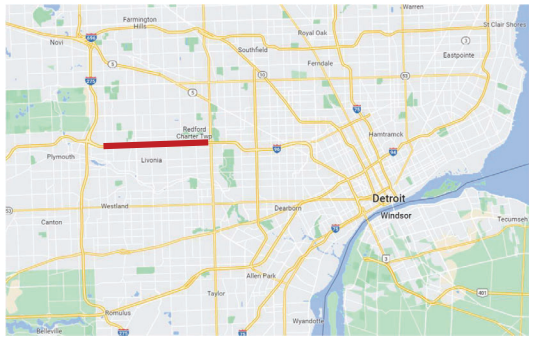
Full Closure + Detour

I-96 fixed

- 700,000 syd of concrete recycled
- 1.2 million cyd of excavation
- 30,000 lin. ft. of conc. sewer pipe
- 850,000 tons of agg. base
- 270,000 cyd of paving concrete
- 78,300 cyd of ready-mix conc.
- 85,000 lin. ft. of barrier wall
- $148M in 167 days (<6 months)



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Full Closure + Detour

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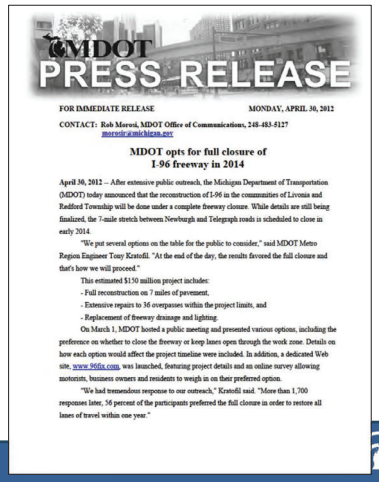


MDOT PRESS RELEASE

FOR IMMEDIATE RELEASE MONDAY, APRIL 30, 2012

CONTACT: Rob Morosi, MDOT Office of Communications, 248-483-5127
morosir@michigan.gov

MDOT opts for full closure of I-96 freeway in 2014

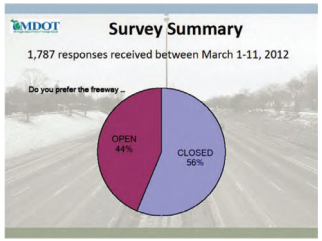
April 30, 2012 -- After extensive public outreach, the Michigan Department of Transportation (MDOT) today announced that the reconstruction of I-96 in the communities of Livonia and Redford Township will be done under a complete freeway closure. While details are still being finalized, the 7-mile stretch between Newburgh and Telegraph roads is scheduled to close in early 2014.

"We put several options on the table for the public to consider," said MDOT Metro Region Engineer Tony Kratofil. "At the end of the day, the results favored the full closure and that's how we will proceed."

This estimated $150 million project includes:
- Full reconstruction on 7 miles of pavement.
- Extensive repairs to 36 overpasses within the project limits, and
- Replacement of freeway drainage and lighting.

On March 1, MDOT hosted a public meeting and presented various options, including the preference on whether to close the freeway or keep lanes open through the work zone. Details on how each option would affect the project timeline were included. In addition, a dedicated Web site, www.96fix.com, was launched, featuring project details and an online survey allowing motorists, business owners and residents to weigh in on their preferred option.

"We had tremendous response to our outreach," Kratofil said. "More than 1,700 responses later, 56 percent of the participants preferred the full closure in order to restore all lanes of travel within one year."



- **It CAN be done!**
- Allowed for accelerated timeline
- Significant taxpayer savings

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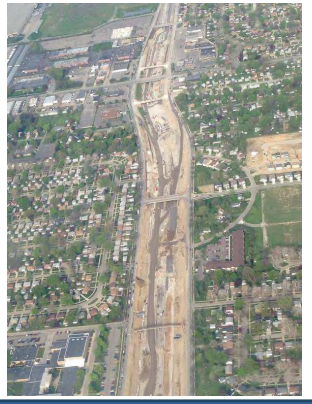
Full Closure + Detour

I-96 fixed



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Full Closure + Detour

Full Closure + Detour

Apr 7, 2014

Sep 21, 2014

Full Closure + Detour for Concrete Intersections

- Typically numerous alternate routes exist for detour options
- Can allow for fast pavement replacement projects
- For full reconstructs, utilities often drive schedule

Summary

- Michigan has demonstrated a number of different Maintenance-of-Traffic (MOT) schemes for concrete paving projects
- The specific one chosen for a particular project will depend on a number of factors, including:
  - Facility type / classification
  - Traffic level / ability to reduce # of lanes during construction
  - Available detour routes and/or ROW restrictions for temporary widening
  - Type of concrete paving (overlay, replacement, full reconstruct)
  - Other items of work in the contract

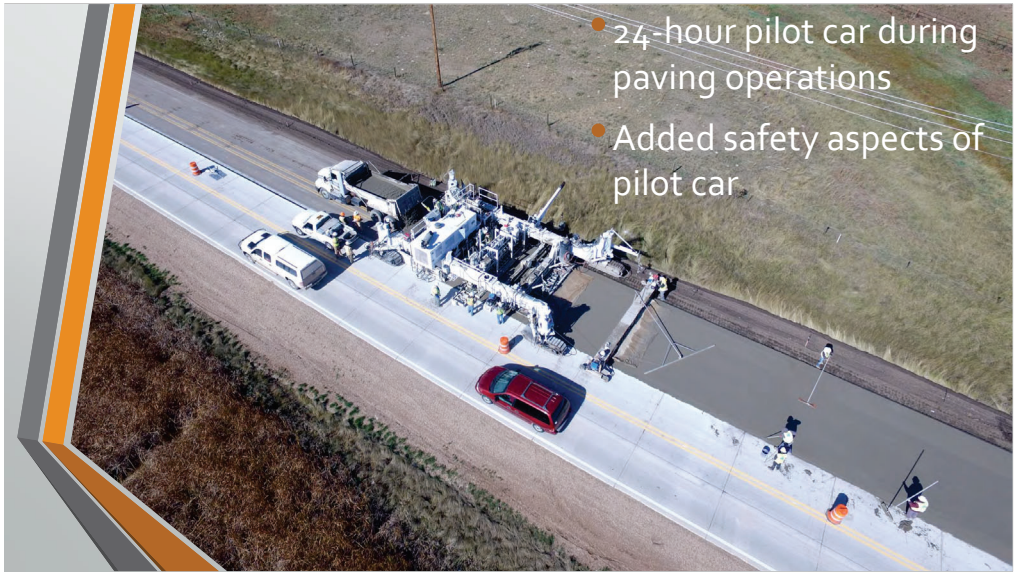
The concrete pavement solution for all 2 lane road applications

Matt Fonte
Fonte and Company
Consulting

The journey of 4 projects

- US 385 near Idalia, CO – 7" concrete on FDR
- CO Hwy 13 north of Craig, CO – 6" concrete overlay
- US 287 corridor from Oklahoma to I-70 in Limon, CO
- US 50 Fowler, CO to Manzanola, CO - 6" concrete overlay and 8" reconstruct

- 7" concrete
- Full Depth Reclamation (FDR) with out cement treatment
- Day time lane closures during FDR process
- Dust control while traffic is on the FDR
- Road elevation vs. additional embankment



- 24-hour pilot car during paving operations
- Added safety aspects of pilot car

- Narrow shoulder / narrow paving passes
- Paver tack pad line

Colorado State Highway 13

A picture-perfect project

- Northwest corner of Colorado
- Alternate bid project 6" asphalt vs. 6" concrete
- Concrete first cost low with out a LCCA adjustment
- Project average IRI in the 40's

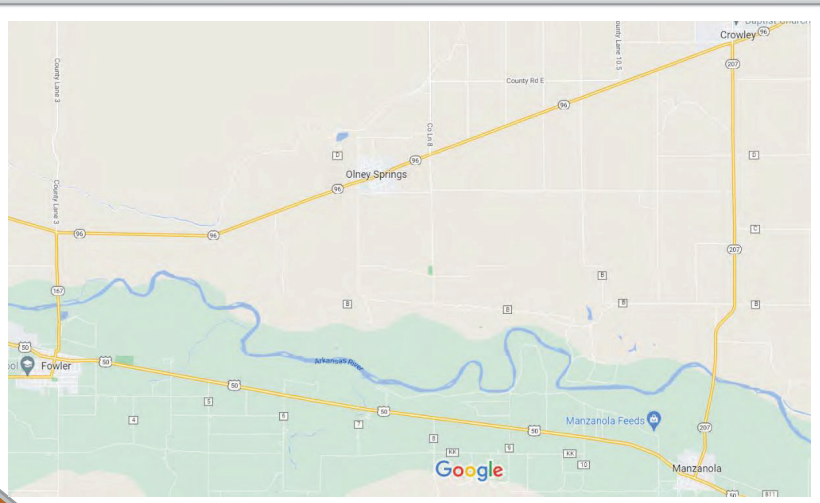
- Milling was at the contractor's option
- Cost of milling vs. Cost of concrete overrun
- Daily lane closures during milling operations
- Using millings for shouldering without "chunks"
- Correcting cross slope with millings
- Have a good milling plan before you start

- Paving operations under 24-hour pilot car
- Production controlling factors
- Millings cross overs at intersections between phases
- Optimized gradations and pavement smoothness

- US 287 "The port to the plains corridor"
- Major truck route through Colorado
- The bulk of the corridor is concrete
- South half of the corridor is 9" to 12" concrete overlays
- Currently CDOT is adding passing lanes throughout the southern corridor

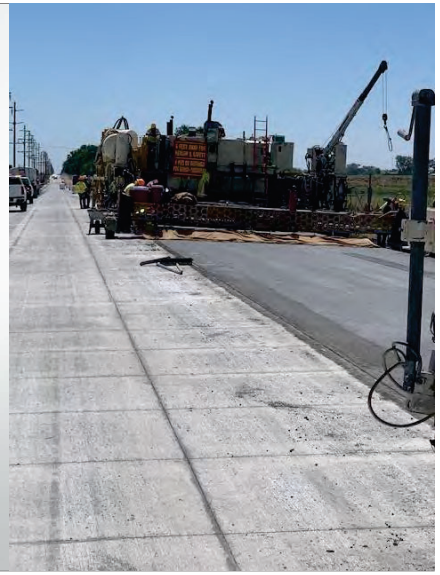
- Traffic speeds during construction
- Temporary rumble strips
- Flashing radar speed signs
- Setting performance requirements for traffic Q's
- Local traffic will find a way around your construction

- US 50 Fowler to Manzanola
- 6" concrete overlay and 8" reconstruct
- Project was completed 2 months ahead of schedule
- Full closure of the road and detour traffic
- Average IRI in the 50's



- Develop a milling plan
- Core possible thin area before you start
- Milling under the bars
- Not milling full width
- Outgoing project managers
- Face to Face communication with your neighbors

- This project was completed in a matter of months
- This project was completed 2 months early
- This project would have been completed even earlier but was held up waiting on guard rail material (COVID?)



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Summary

- A good project team both agency and contractor can make or break a project, not perfect but willing to work together.
- The communication of the project team and the public is crucial.
- Get the traveling publics attention and get them slowed down before the work zone.
- The concrete industry is capable of paving to a specified grade, maintaining a safe cross slope.

Summary

- Concrete pavements impact traffic 3 to 4 times less over their life span of 30, 40, 50+ years
- Don't limit closure length but instead set performance criteria on wait times.
- Concrete is a viable option for all 2 lane road applications.
- Concrete is the less expensive, smoother, longer lasting pavement option.

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Thank You

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