CONSTRUCTION WORK ZONE MANAGEMENT

Stories, Lessons Learned, and the Future

NOVEMBER 17, 2017
WORK ZONE SAFETY

Understanding the Human Factor

CAPTAIN MIKE HANSON
Minnesota State Highway Patrol
SIMILARITIES?
THE REALITY

Work Zones are DANGEROUS

2011 – 2015

41 Fatalities
39 Fatal Crashes
60 Serious Injury Crashes
THE DANGER IS REAL
THE RESULTS ARE TRAGIC
HOW CAN WE PREVENT THIS?
If you can **ANTICIPATE**

**YOU CAN PREVENT**

- Planning and communication
- Clearly defined path—effective channeling
- Tight barriers
- Leave nothing to chance
- Simple and no options
THE BEST LAID PLANS...
AND THE BEST IMPLEMENTATION...
CAN BE LOST IN A SPLIT SECOND
ENFORCEMENT PARTNERSHIPS

- Invite enforcement to the table early in the planning process
  - Use our experience and understanding of the area and typical traffic patterns/behaviors

- Safety of the work zone is paramount
  - Your crew, the public, the officers

- Enforcement challenges
  - Ability to safely work the zone
  - Legal considerations (signing, speed limits, etc.)
ADVANCED WARNING AREA
TRAFFIC IS STOPPED
WHY
She got a text from her daughter.

She picked up her phone from the dash and read the text.

She had earlier sent her children a text that said she would pick them up after 2:00 PM. She received in response, “Okay.”

She tried to replace her phone on her dash but she accidentally dropped it. She looked down and was reaching for her phone.

She rear-ended the Fit. She could not recall if she braked before the crash.
OUR BIGGEST CHALLENGE:

DISTRACTION
YIKES!
YES - THIS IS AN ACTUAL PHOTO
DON’T BE THAT GUY!
REMEMBER THE GOOD OLD DAYS?
CAN TECHNOLOGY SAVE US FROM OURSELVES?
THE PERFECT WORK ZONE 😊
WORK ZONE MANAGEMENT
The Local Perspective

CHAD MILLNER
City of Edina
WORK ZONE MANAGEMENT
Local Perspective

AGENDA

Temporary Work Zones
Roles and Responsibilities
Communications
Resident Expectations
Impact of Other Agencies

THANK GOD IT'S FRIDAY
"Engineers shall hold paramount the safety, health and welfare of the public."

Even the BEST-LAIĐ PLANS sometimes go WRONG
WORK ZONE MANAGEMENT
Local Perspective

WORK ZONES (TEMPORARY OR DAILY)

Most Local Projects

- Street Reconstruction with Utilities
- Street Maintenance
- Standalone Utility
- Various Spot Repairs
- Sidewalks
- Work Zones last minutes to hours depending on operations

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Local Perspective

Even the BEST-LAIDED PLANS sometimes go WRONG

- Lunch Time Distraction
- Car Removed
- Concrete Re-Finished
- Aesthetic Issues
- Structurally Sound
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Local Perspective

WORK ZONES
Temporary/Moving

- Communicate Prior
- Proper Personnel to Direct Traffic
  - General Traffic
  - Driveway Access
- Proper Signage/Traffic Control

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WORK ZONES
Temporary / Moving

- Proper Signage/ Traffic Control
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WORK ZONES

- No open trenches overnight
- 6-inch watermain installation
- Barrels and cones
- Just finished
- Access from a driveway
- Thru barrels and over cones

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- Material Storage
  - Drivers and Kids

- Pipe Secured
  - Temporary Playground
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WORK ZONES

- Distracted drivers
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Local Perspective

ROLES AND RESPONSIBILITIES

- Everyone
  - Contractor – accurate schedules / work zone layouts
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Local Perspective

ROLES AND RESPONSIBILITIES

- Everyone
  - **Project Manager** – review management plans
  - **Inspector** – ensure what was discussed is done
  - **Fire/EMS** – notifications / call list
  - **School Districts** – busing operations notifications
  - **Residents/Public** – Inform of issues

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ROLES AND RESPONSIBILITIES

- Everyone
  - Police – situation specific
    - Moving signs
    - Not obeying flaggers
    - Driving on sidewalks / lawns
    - Creating unsafe situations
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Local Perspective

Even the BEST-LAID PLANS sometimes go WRONG
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Local Perspective

COMMUNICATIONS

- Military Adage – *Proper Prior Planning Prevents Poor Performance*
  - Street Reconstruction – 5 years out as a map on website
  - 2-3 years neighborhood meetings
  - 1-year detailed neighborhood meeting
  - 6-months Public Hearing with City Council
  - 1-month contract award

NOW it’s time for
WORK ZONE MANAGEMENT
WORK ZONE MANAGEMENT
Local Perspective

COMMUNICATIONS

NOW it’s time for WORK ZONE MANAGEMENT

- Letter to residents to outline communication plan
- Meet and greet with contractor and inspector
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Local Perspective

COMMUNICATIONS

- Meet and greet with contractor and inspector

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Local Perspective

COMMUNICATIONS

- Website
- City extras
  - Weekly email notification system
- Door hangers / knock on doors
  - Utilities, driveway access, paving
- Social media – limited response
  - Twitter

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Local Perspective

COMMUNICATIONS
WORK ZONE MANAGEMENT
Local Perspective

COMMUNICATIONS
WORK ZONE MANAGEMENT
Local Perspective

RESIDENT EXPECTATIONS

- Spectrum of Expectations
  - To the minute schedule
  - 2-days without water – no big deal
  - I asked them to move 5 minutes ago and they haven’t
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COMMUNICATIONS/EXPECTATIONS

- Hennepin County Courts
  - Rear-view mirror
  - Hit traffic control sign
  - $300 repair

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IMPACTS OF OTHER AGENCIES

- Private Utilities
- County
- MnDOT
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Local Perspective

IMPACTS OF OTHER AGENCIES
- Private Utilities
- County
- MnDOT

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Local Perspective

IMPACTS OF OTHER AGENCIES

- Private Contractors
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Local Perspective

IMPACTS OF OTHER AGENCIES
“Engineers shall hold paramount the safety, health and welfare of the public.”

Even the BEST-LAI organ sometimes go WRONG
CONSTRUCTION TRAFFIC IMPACTS

STEVE BARRETT
Resident Engineer / MnDOT Metro District
MnDOT CONSTRUCTION’S ROLE

PLANNING

- Preliminary Staging/MOT Planning

DESIGN

- Coordination Meetings
- Special Provisions
  - Time and Traffic
  - Night Work
  - Contractor’s Schedule Submission
MnDOT CONSTRUCTION’S ROLE

DURING CONSTRUCTION

- Inspect/Adjust MOT
  - Signs, barriers, striping, message boards, RTMC
  - Extra work, unanticipated conditions
- Coordination (MnDOT Traffic/RTMC, transit, city/county, emergency services, etc.)
- Coordinate with events and other projects
- Order signs, message boards, 511mn website updates
- Assist PR staff w/ website content, news releases, open houses, etc.
WORK ZONE SAFETY

- Workers
- Motorists
- Bikes/Pedestrians
TRADITIONAL CPR
CASE STUDY (2013):
SP 0285-65:
I-694 between I-94 and I-35W

Concrete and Bridge Rehab
MOT: CPR REHAB ON 3 LANES

- Maintain 2 lanes during the day, 1 lane at night (always provide a one-lane work zone buffer during working hours)
- Limited weekend full closures
  - Areas with less than 3 lanes
  - 35W/694 Interchange
- Utilize 24-hour WZ speed limit and extraordinary State Patrol enforcement
CASE STUDY (2015):
SP 2789-136 (I-394):

Concrete Pavement Rehabilitation
CONSIDERATIONS

- Traffic Control Options
  - Keep traffic where it is, work on one lane at a time, use nighttime lane closures for working room – dismissed (large traffic impact, inefficient working conditions, safety concerns)
  - Full directional closures (weekends)
  - Full directional closures (extended periods)

- Constructability Reviews With Potential Bidders
  - Extended duration full closure alternative selected

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CONTRACT PROVISIONS

- Two long term (13 days WB, 11 days EB) closures of I-394
- Specific dates in contract for the closures
  - Begin 10 PM Friday June 19 & Friday July 10
  - Incentive/Disincentive: $30,000/day
  - Specific dates allow for notification, coordination, maximum control for the owner
CONTRACT AWARD

- **One Bidder** - PCI Roads
- **Engineers Estimate** - $10.6 million
- **PCI Bid Amount** - $12.9 million (22% over)
- MnDOT paid a premium for demanding a lot from its contractor

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IMPROVEMENTS AND POSITIVE RESULTS ON I-394

- Work zone much safer
- Daylight working conditions
- Still had night operations – milling, grinding, bituminous shoulders, striping, etc.
- Traffic impacts seemed better than expected (PR efforts paid off)

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PAVEMENT REHAB OPTIONS

- Concrete CPR vs Bit Overlay
  - Service life
  - Design “tails” from grade raise
    - Barrier, bridge clearance, drainage
  - Construction time required
RESULT: ONE SEASON PROJECT

- MOT driven by both bridge and roadway work
- Bituminous overlay north of TH 55 (weekend full closures)
- Concrete CPR on ramps and south of TH 55 (including Lowry Tunnel)
  - Cross traffic over and utilize 4 lanes through one half of the tunnel
  - 70 day max duration to complete both sides
- Repair/rehab of 50 bridges
- All work prohibited Memorial Day, July Fourth, Labor Day 3-day weekends
- A+B, direct incentives, and $800k Locked Incentive Date (LID) provisions

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EVOLUTION OF MOT STRATEGY FOR MnDOT METRO CONCRETE PAVEMENT REPAIR PROJECTS

- Remove traffic completely if possible
  - Improves safety, efficiency, quality
- Strive for daylight working conditions
- Utilize well-conceived incentive clauses
- Reduce speeds, add extra enforcement
- Communicate using signs, media, email, etc.
TOWARD ZERO DEATHS

SUSAN YOUNGS
TZD Regional Coordinator - Metro
VISION

To reduce fatalities and serious injuries on Minnesota’s roads to zero
MINNESOTA’S TRAFFIC-RELATED DEATHS
1995-2003
TZD CORNERSTONE

FOUR “E” APPROACH:
 Enforcement
 Engineering
 Education & Outreach
 Emergency Medical & Trauma Services
 EVERYONE ELSE!
  (Legislators, Judicial, Media)
TZD HARD HAT STICKER STATEWIDE DISTRIBUTION PLAN

HANG UP!
Lives At Stake. Orange Cones. No Phones.
AVAILABLE RESOURCES

This work zone crash happened as the motorists were believed to be texting and driving. Three MnDOT employees were standing right where the cars ended up. Luckily they were able to get out of the way. (Drivers were not hurt in crash either.)
PEDAL KART & DRUNK GOGGLES
SEAT BELTS

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NEW TECHNOLOGIES
AUTOMATED VEHICLES
SMARTPHONE ALTERS
Work Zone Ahead

SLOW DOWN
STOPPED TRAFFIC
AUTOMATED FLAGGERS
WEARABLE DETECTION VESTS
HERE AN APP... THERE AN APP... EVERYWHERE AN APP...
QUESTIONS?

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