IHCP and other MOT Considerations
2022 INDOT Bridge Design Conference

February 22, 2022

INDOT Work Zone Safety

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Outline for Today's Presentation

- The Interstate Highway Congestion Policy (IHCP) Exception Process
  - Identify when an IHCP exception is needed
  - Review IHCP Mitigation Tool Box
  - Review IHCP Process
  - Special Considerations and Opportunities
  - Common considerations for bridge only requests
- Work Zone Transition Areas
- Barrier Transitions
- Provide an Opportunity for Questions

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The IHCP Exception Processes
2022 INDOT Bridge Design Conference

February 22, 2022

Written by Jim Poturalski, Senior Director of Engineering and Research
As presented by *Mischa Kachler, Supervisor, Work Zone Safety Section*
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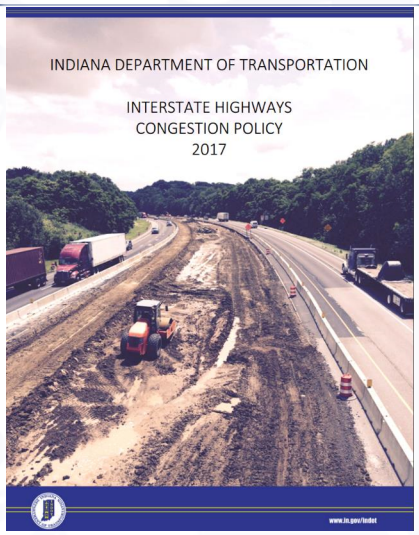
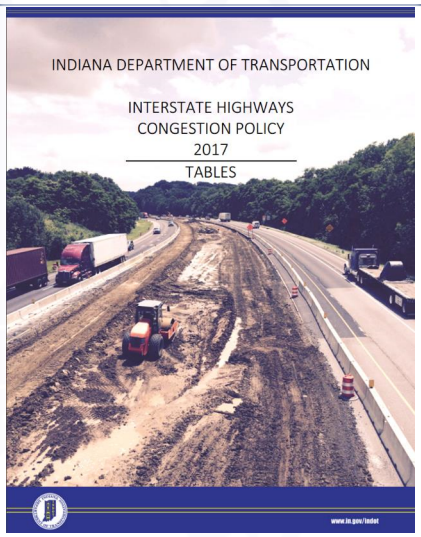
2017 Interstate Highways Congestion Policy (IHCP)





Effective January 6, 2017
Referred to as the “IHCP” or the “Policy”

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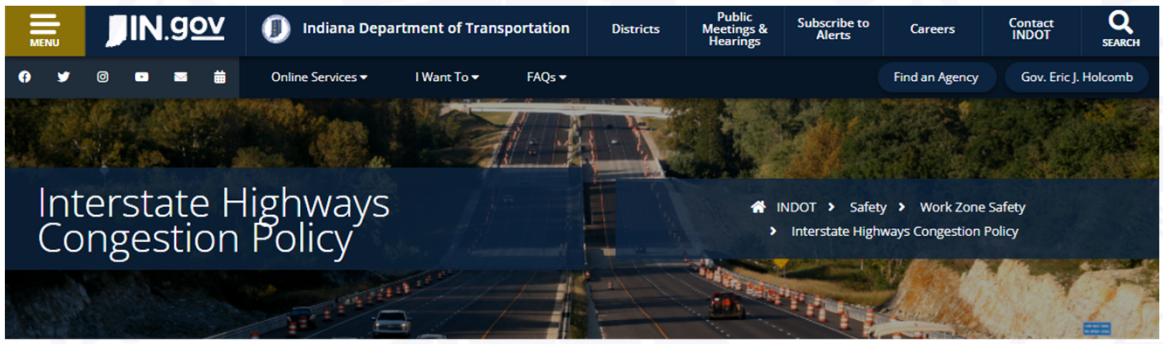
https://www.in.gov/indot/3383.htm



It is INDOT's policy to limit operations which reduce the number of lanes, reduce the width of lanes, or may otherwise cause congestion to occur on an interstate route. The goal of this policy is to ensure that, whenever possible, construction and maintenance activities on interstate facilities are scheduled to maximize safety and efficiency, and to minimize risks to all users and workers in and around work zones.

This policy has been developed pursuant to federal requirements as outlined in 23 CFR 630 Subpart J and Subpart K to reduce congestion caused by temporary operations on interstate routes and to improve safety for motorists and workers through the thoughtful selection of work hours and strategy. Operations covered under this policy include, but are not limited to; construction, maintenance, utility work, data gathering, and facilitating special events.

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Why does the policy exist?

- Policy developed pursuant to federal requirements in 23 CFR 630
  - to "reduce congestion…improve safety for both workers and motorists"
  - by preventing or mitigating queues and back-of-queue crashes
  - "through thoughtful selection of work hours and strategy"
- Purpose of the Policy

  "…to ensure that work zones provide optimal safety for workers and all other users of the work zone. To achieve this goal, work zone restrictions […] shall be scheduled to maximize efficiency by the appropriate selection of work hours [and by implementing] appropriate countermeasures […] to provide the best level of service achievable for motorists…"

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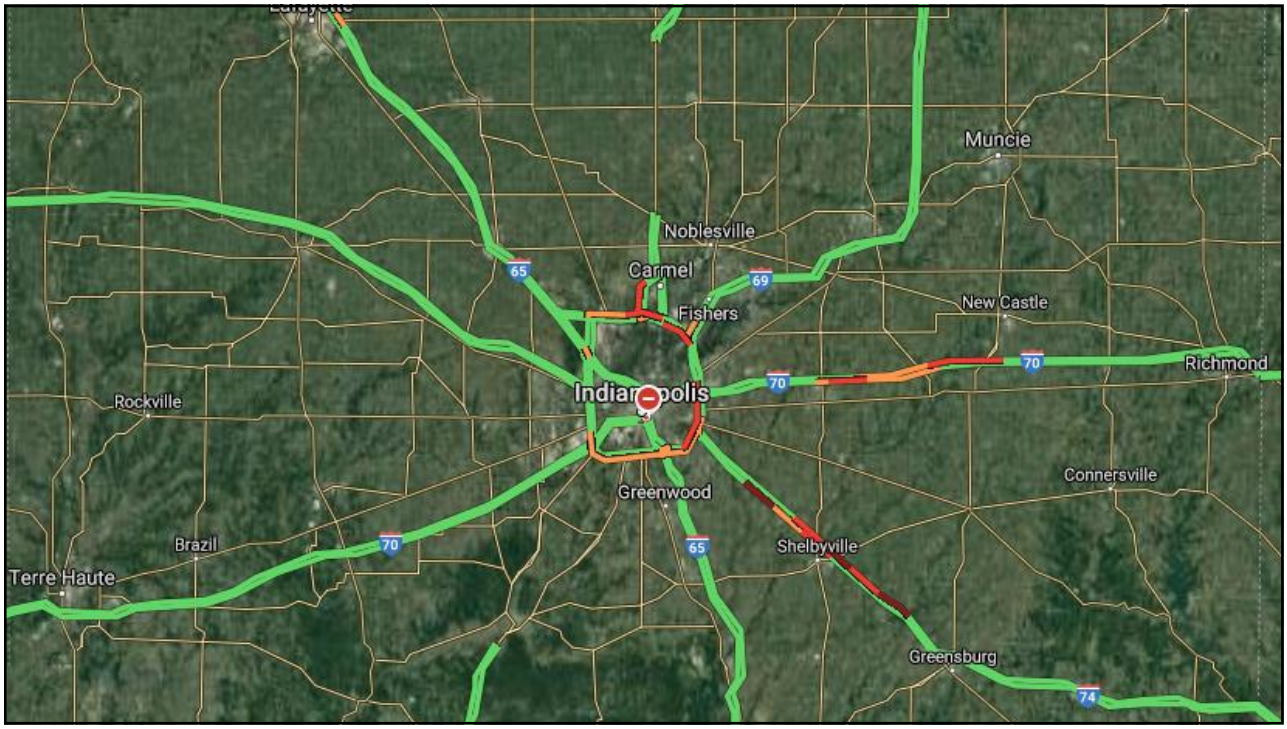
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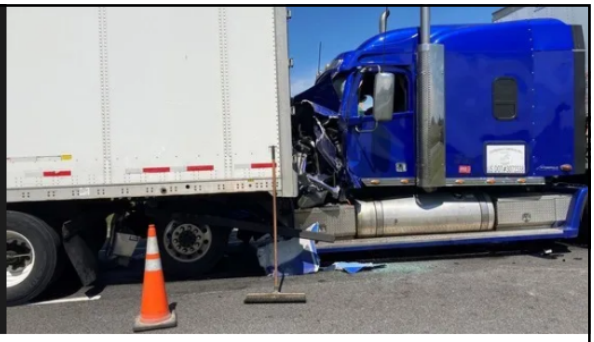
Illinois man dies after three semis crash on I-70

Posted: Sep 4, 2021 / 07:16 AM EDT
Updated: Sep 4, 2021 / 09:38 AM EDT



Illinois man dies after semis crash on I-70

SHARE

HENRY COUNTY, Ind. (WANE) – Troopers from the Indiana State Police Pendleton District responded to a multiple vehicle crash involving three semi tractor-trailers on I-70 near the 124 mile-marker on September 3 before noon.

The preliminary investigation by Master Trooper Barry Bischoff revealed a 2018 Freightliner semi tractor-trailer driven by Radenko Dzamic, 68, of Lyons, Illinois was traveling westbound in the right lane. Traffic in the area was moving slow due to a construction zone.

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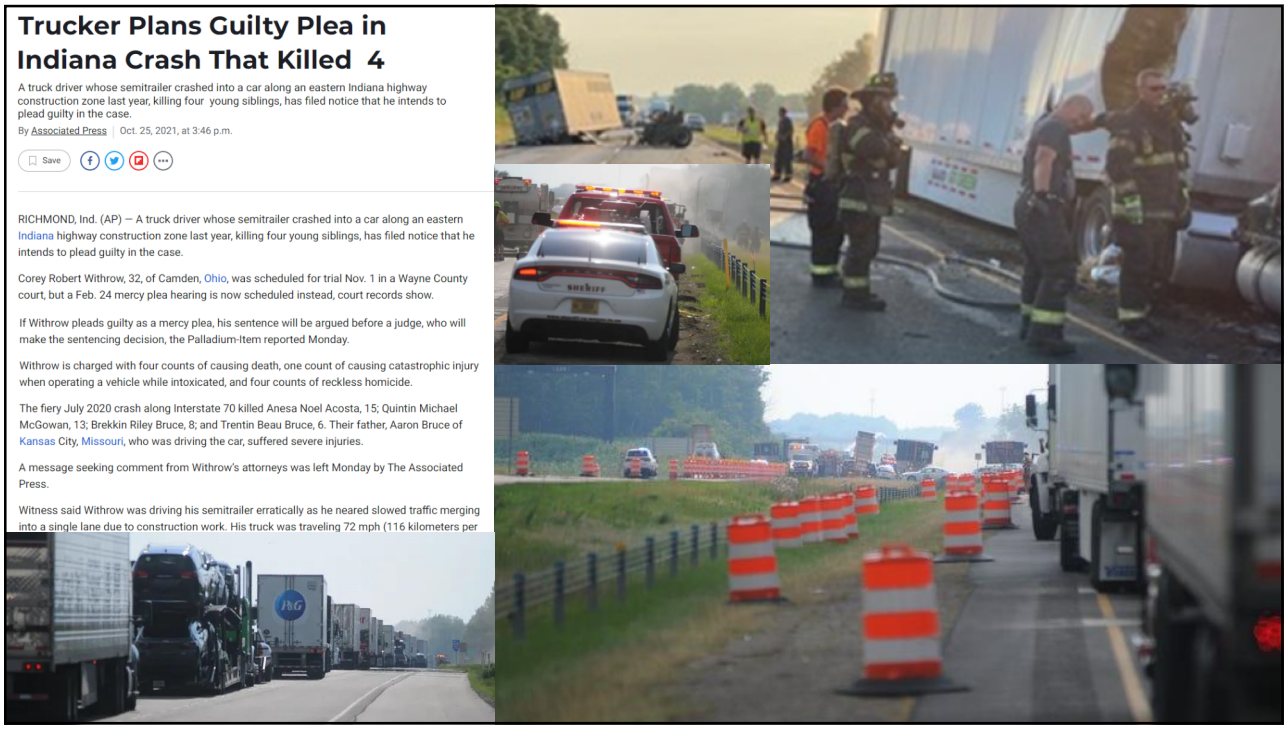

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What does the policy NOT do?

The intent is not to prevent work outside of policy criteria from happening; rather it is to make sure that alternatives have been considered and that the best times have been selected.

The IHCP is not intended to…

- prevent work from being done on the interstate
- artificially add scope or costs to a project

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The Interstate Highway Congestion Policy (IHCP)

Policy allows some lane restrictions to be done without exceptions → "Pre-approved Closures" (see tables in Appendix B)

- Single lane with a minimum width of 11 ft
- typically, nights and weekends
- typically, in rural areas or in urban areas with more than 3 lanes

IMPORTANT NOTES:

- Careful development of an MOT plan (and TMP) still required.
- Lane closures with lane widths below 11 ft still need an exception, regardless if in areas of pre-approval.
- Recommended to evaluate when using 11 ft lanes and 1 ft shoulders.

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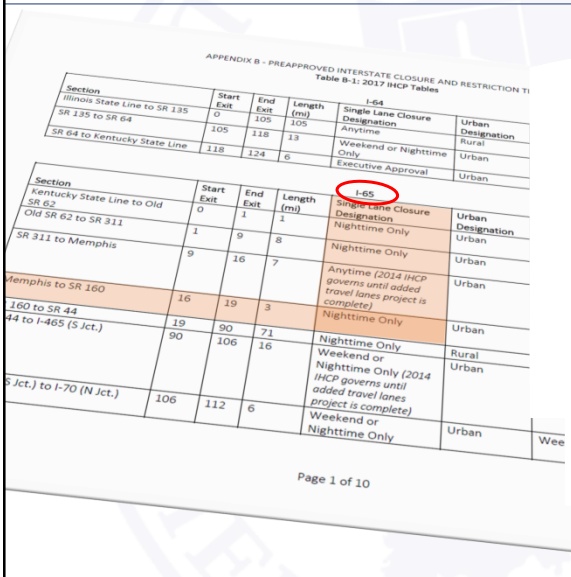
The Interstate Highway Congestion Policy (IHCP)



APPENDIX B - PREAPPROVED INTERSTATE CLOSURE AND RESTRICTION TI

Table B-1: 2017 IHCP Tables

I-64

Section	Start Exit	End Exit	Length (mi)	Single Lane Closure Designation	Urban Designation
Illinois State Line to SR 135	0	105	105	Anytime	Rural
SR 135 to SR 64	105	118	13	Weekend or Nighttime Only	Urban
SR 64 to Kentucky State Line	118	124	6	Executive Approval	Urban

I-65

Section	Start Exit	End Exit	Length (mi)	Single Lane Closure Designation	Urban Designation
Kentucky State Line to Old SR 62	0	1	1	Nighttime Only	Urban
Old SR 62 to SR 311	1	9	8	Nighttime Only	Urban
SR 311 to Memphis	9	16	7	Anytime (2014 IHCP governs until added travel lanes project is complete)	Urban
Memphis to SR 160	16	19	3	Nighttime Only	Urban
160 to SR 44	19	90	71	Nighttime Only	Rural
44 to I-465 (S Jct.)	90	106	16	Weekend or Nighttime Only (2014 IHCP governs until added travel lanes project is complete)	Urban
Jct.) to I-70 (N Jct.)	106	112	6	Weekend or Nighttime Only	Urban

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unless a Policy Exception has been approved as

Each preapproval category and its definition are listed below:

- Anytime: Single lane closures or single lane restrictions any time of day or night in each direction.
- Weekend or Nighttime Only: Single lane closure or single lane restrictions in each direction between Friday 9:00 p.m. through Monday 6:00 a.m. and weekdays 9:00 p.m. to 6:00 a.m.
- Weekday or Nighttime Only: Single lane closure or single lane restriction in each direction from Sunday 9:00 p.m. to Friday 6:00 a.m. Nightly lane closures allowed on Friday and Saturday from 9:00 p.m. to 6:00 a.m.
- Nighttime Only: Single lane closure or single lane restriction in each direction any day of the week from 9:00 p.m. to 6:00 a.m.

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- Executive Approval: Except for conditions designated as an "Emergency" or "Urgent", a Policy Exception approved by the appropriate authority is required before any lane closure or lane restriction takes place in these segments.

TIME DESCRIPTIONS FOR SHOULDER CLOSURE ONLY DESIGNATIONS

Each segment is given a "Shoulder

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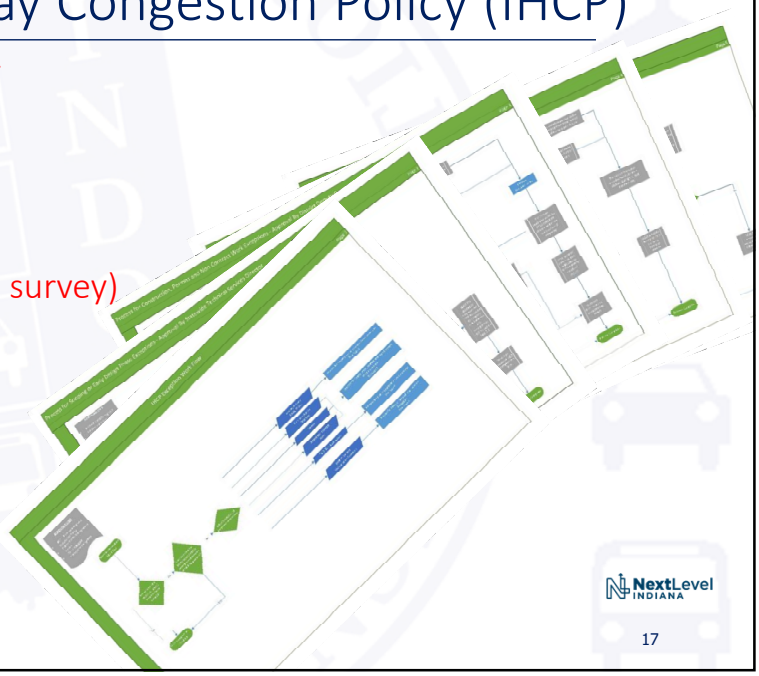
The Interstate Highway Congestion Policy (IHCP)

Policy exceptions are required for

- Construction
- Maintenance
- Permits
- Advance Design Work (geotech, survey)

Flow charts describing the Exception process are available on website. www.in.gov/indot/3383.htm



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When is an IHCP exception needed?

An Exception is NOT needed for:

- Incident Response (not covered here)
- Emergency/Urgent Repairs declared by District Deputy Commissioner (not covered here)
- Pre-approved lane and shoulder closures (previously covered)

An Exception is needed when:

- A single lane closure is anticipated outside of pre-approved times
- A closure of multiple lanes is being planned
- A lane width less than 11 ft will exist
- A restriction of lanes over a holiday will exist (not commonly considered)
- A closure of a lane along a segment being utilized as a detour for another interstate
- A full closure of an interstate ramp is expected longer than 10 minutes (includes on ramps and off ramps)
- A rolling slowdown (outside of pre-approved process in IHCP) or 20 minute closures are expected

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Jim's Simple Rule for Interstate Work

AVOID
- Avoid conditions that would require an exception if possible

MINIMIZE
- If conditions will require an exception, minimize the duration of time an exception is needed (minimize number of hours or days a condition is in place that will generate queuing)

MITIGATE
- Determine the best methods that reduce the risk (and increase safety for motorists and workers)

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Mitigation Toolbox

- Incentive/Disincentive options, A+B bidding, Liquidated Damages
- Weekend and Night work when appropriate
- Coordination with other projects – i.e., bundling – do adjacent pavement and bridge work with a single MOT phase – plan is to work in corridors moving forward
- Accelerate work/defer work to allow for a "get in, get out, stay out" approach
- Appropriate use of reduced speed limits
- Directional closure of the interstate
- Ramp closures can be an effective tool to minimize impacts
- Queue Detection and Warning Systems
- Protect-the-Queue trucks
  - Requires approval of approving authority before adding to contract
- Use of moveable wall (addresses directional peaks, day of week and time of day peaks)
  - Requires coordination with central office liaison if being considered

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IHCP Process/Steps

- When to start the IHCP process
  - The IHCP process should be considered in the **project scoping stage** and started such that options can be discussed at preliminary field checks
  - For complicated/impactful MOT schemes, the IHCP process should include meetings **early** in the project
- Timing for submitting the IHCP request
  - The final IHCP exception request should be "**approved**" **prior to stage 3** plan submittals so that all mitigation options, pay items, major cost elements, etc. have been accounted for during these final plan reviews

  (See Design Memos 21-05 and 21-08 for specifics – March 11, 2021)
- **District Traffic staff** are assigned as reviewers and typically should be part of any early meetings to discuss the IHCP exception (especially for the more complex requests)
- Jim Poturalski has been delegated the authorized **approving authority** for all exception requests prior to project letting and as of June 1st also to post letting IHCP exception requests

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Special Considerations

- Interstate to Interstate ramp closures require a **concurrence from FHWA** as part of the IHCP exception approval process.
  - Typically need to identify an interstate detour when a system interstate ramp is closed (in many cases would utilize adjacent interchanges)
- Full or directional closure of interstates require a much more detailed documentation and FHWA approval. This process can take **several months** to develop and some **extra time** for FHWA for their review and approval. (not typical for single interstate bridge projects but may be considered for larger corridor projects or when large number of bridges in a corridor are being worked on within a larger project)
- Exception requests needed **after a contractor is working** require a similar process for approval and should be requested as soon as it becomes known as timing is usually critical for these types of requests
  - Many of these post letting requests can be eliminated if consideration is given for all phases of work or consider likely contingencies that may arise during construction (markings, phase changes, etc.)

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Special Considerations (continued)

Common reasons for new exception requests after letting

- Not accounting for lane or ramp closures associated with **phase 0's** (shoulder strengthening, temporary wall setting, lane markings for lane shifts/crossovers)
- **Phase durations** that don't match the specific requirements in an approved IHCP exception (e.g., exception approved for 7 days and work is now anticipated to last 14 days)
- **Delayed or rescheduled letting** that didn't update an approved exception relative to analyzed work period (e.g., assumed work to be done in spring and work delayed until higher traffic volume months)
- **Contractor requests for change** in MOT plans or phases or approved CRI's (Cost Reduction Incentive requests)
- **Final pavement marking placement** at the end of a contract that cannot be done during cold overnight periods
- **Short term ramp closures** (exceeding 10 minutes) to accommodate paving operations
- Coordination with **adjacent or nearby projects** was not considered

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Some common errors or concerns observed

- Some exception **requests** come in with restrictions that **don't match** the MOT **plans**
  - Need to ensure coordination between exception preparer, designer and PM
- Some items that can **enhance a request and mitigation** include:
  - Reference adjacent or nearby projects that must be coordinated
  - Identify an approved plan to adjust signal timings at intersections that may see significant changes in volume (with a copy of approved exception to INDOT Traffic Management signal staff)
- Some **mitigation** options occasionally **need clarification**, such as:
  - Use of sample mitigation element calling for $2500 Liquidated Damage
  - Use of portable rumble strips or other specific pay items – no longer used on interstates
  - Use of non committed words such as "consider use of …."
- **Mitigation** commitments that **don't match** elements of **CIB** – very critical
- Approved **exception times** that **don't match special provisions** of the project

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Common considerations for bridge only requests

- Short work zones for bridge only work tends to impact capacity less
  - A quarter mile work zone with a lane closure provides greater capacity than a four mile work zone with a similar lane closure
- Hydro demolition of an overhead bridge deck may require lane closures (or 20 minute stoppages) to the interstate below
- Consider work area for equipment with bridge painting contracts
  - Both for work under bridges if needing access from above (shoulder) and for overhead bridges
- Consider best MOT method for overhead beam removal/installation
  - Rolling slowdowns vs 20 minute stoppages vs on/off ramp if at diamond interchange
- Local projects over interstates may still need exceptions if any restrictions will occur on the interstate (lane or shoulder restriction)

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Common considerations for bridge only requests

- Consider cost-effectiveness of temporary structure to carry one direction of travel.
- Consider bridge widening and advance widening if the roadway segment is slated for a future Added Travel Lane upgrade.

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Work Zone Transition Areas

Always Provide an SSD-Based Long. Buffer Space*

* Unless there is a justifiable reason for not doing so

- Often not provided in MOT plans or of insufficient length
- IMUTCD 6C.06 and Table 6C-2

Table 6C-2 Stopping Sight Distance as a Function of Speed	
Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

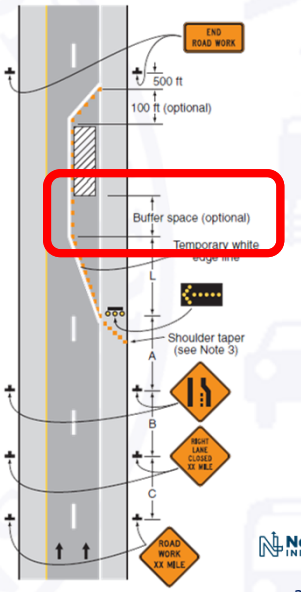
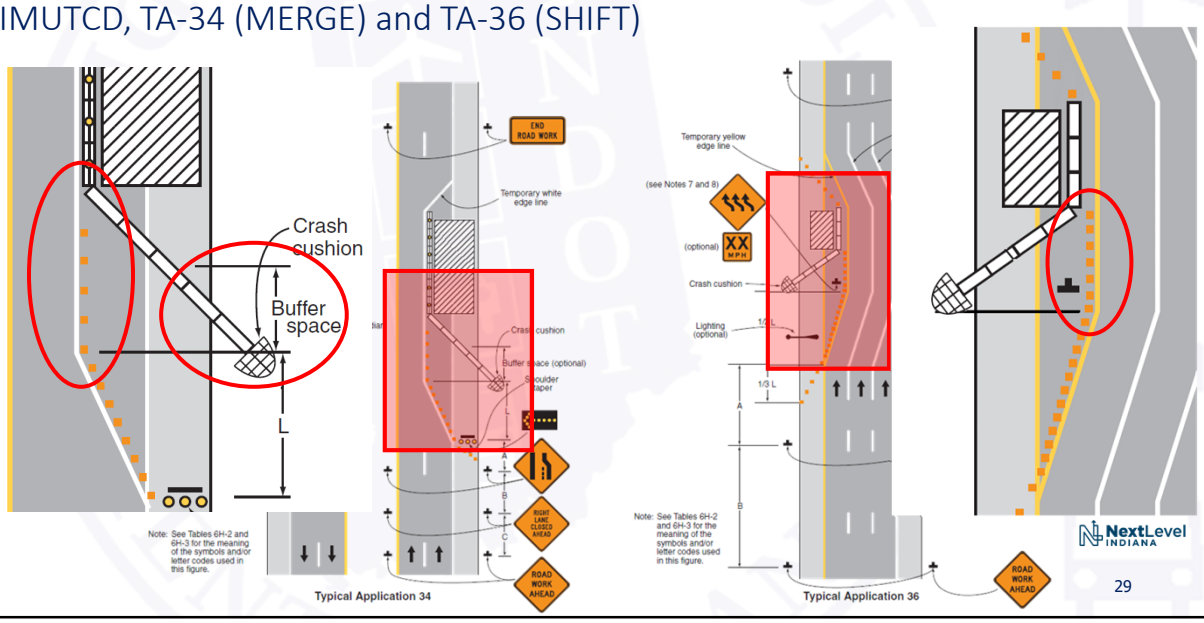


Figure 6H-33. (TA-33)

Delineation at Temporary Traffic Barrier Flares

- IMUTCD, TA-34 (MERGE) and TA-36 (SHIFT)



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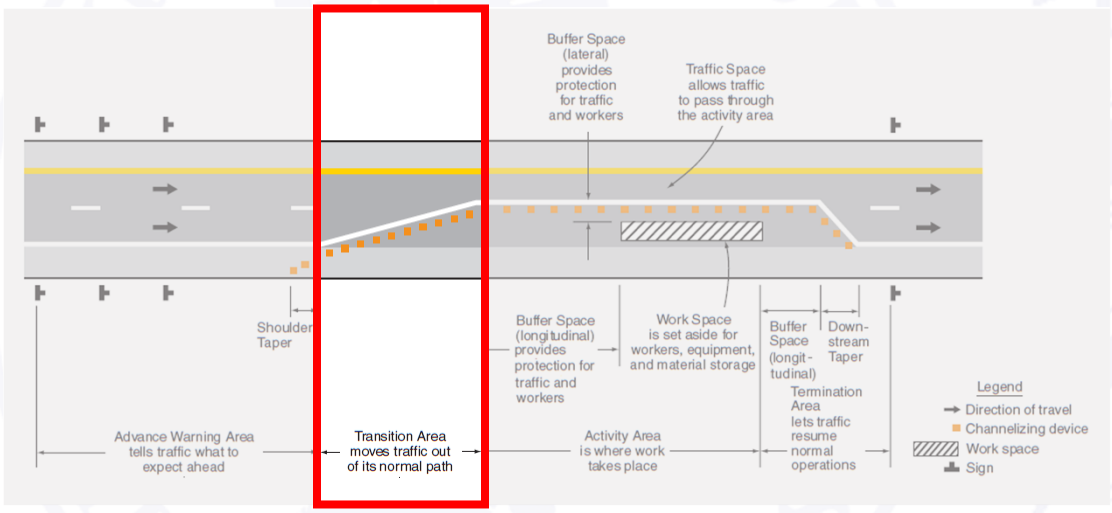
Parts of a Work Zone: Transition Area



Source: MUTCD

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Separate Transitions

- Provide a tangent length between successive tapers:
  → 2L tangent for a merge taper followed by a merge taper. (IMUTCD TA-37)
  → ½L tangent for a merge taper followed by a lane shift. (IMUTCD TA-32)

- Do not combine:
  A merge and lane shift taper.
  Even worse: merge + shift + lane width reduction!
  Even worse: merge + shift + lane width reduction ending at end of TTB flare

- Remember: multi-lane lane shifts require temporary lane markings, regardless how short the duration

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Improve Transitions Into and Within the Work Zone

- Use **longer tapers** into the work zone by using the upstream existing Speed Limit.
- Provide the required **sign spacing** for advance signage.
- Provide **longitudinal Buffer Space** based on SSD.
- Provide additional **lane width** through lane shifts by staggering lane lines for multi-lane shifts – NOT LESS!
- Provide additional **lane width** through cross-overs – NOT LESS!
- Provide sufficient **shoulders** (lateral buffer space).
- **Delineate merge and shift tapers** with construction drums and pavement markings – NOT TEMPORARY TRAFFIC BARRIER (TTB)!
- Provide **longitudinal Buffer Space** after merge tapers – ESPECIALLY BEFORE TTB!

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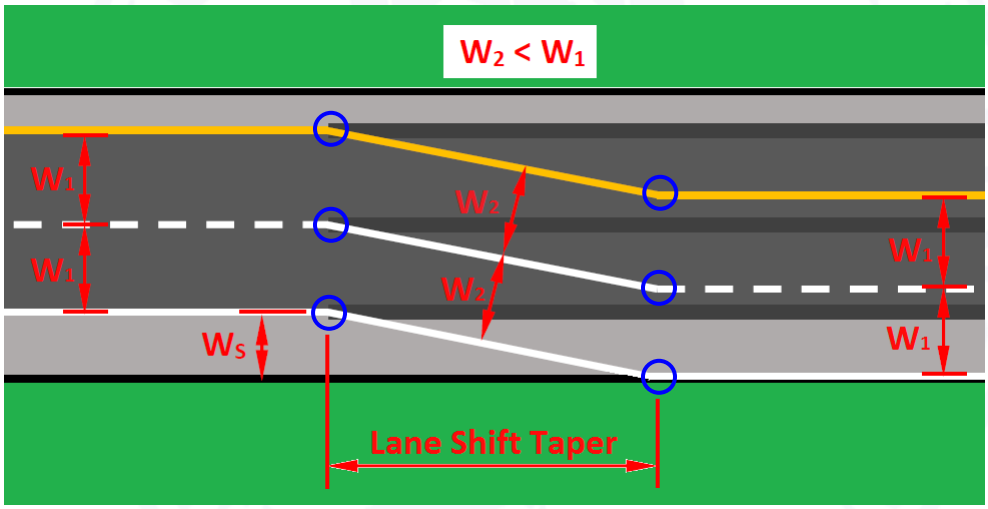
Widen Lanes through Shifts by Staggering the Start

If all lanes start at same station, lane width decreases through shift!



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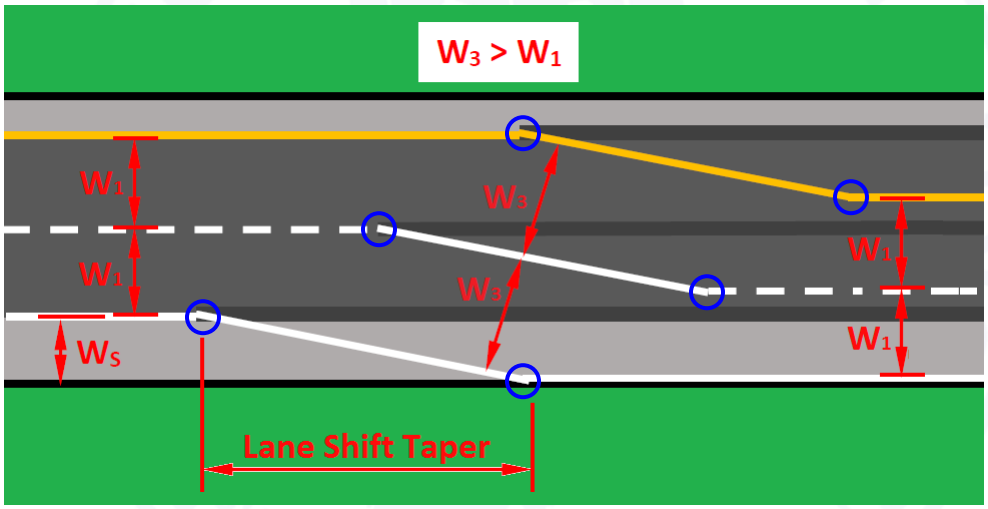
Widen Lanes through Shifts by Staggering the Start

To ensure wider lanes through shifts, stagger the start of the lane shift lines.



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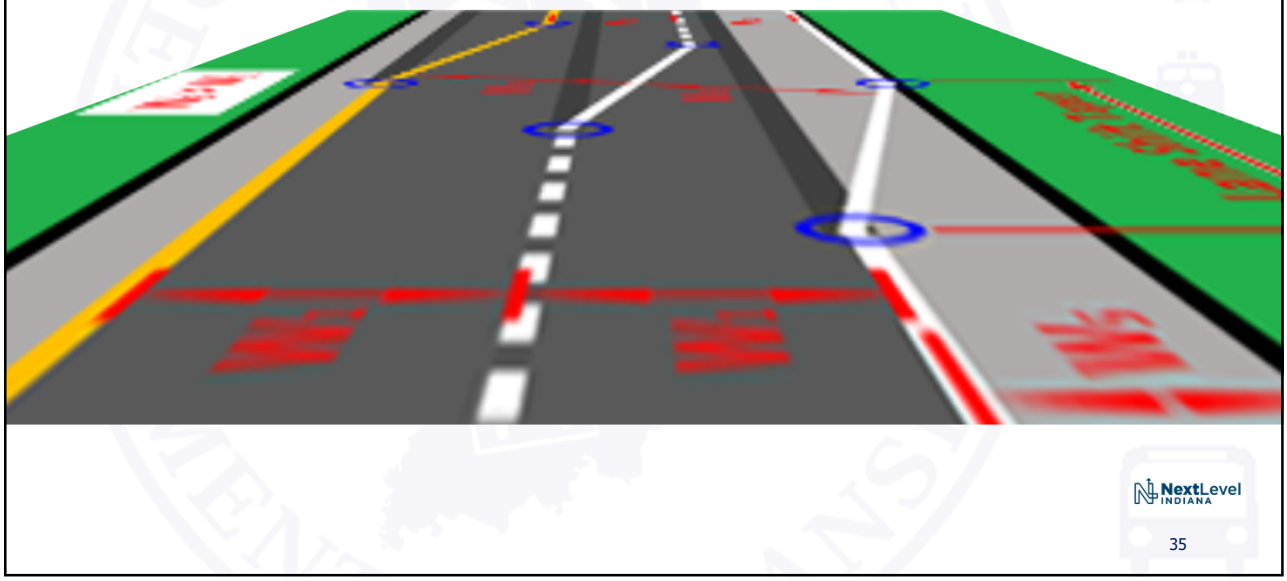
Widen Lanes through Shifts by Staggering the Start



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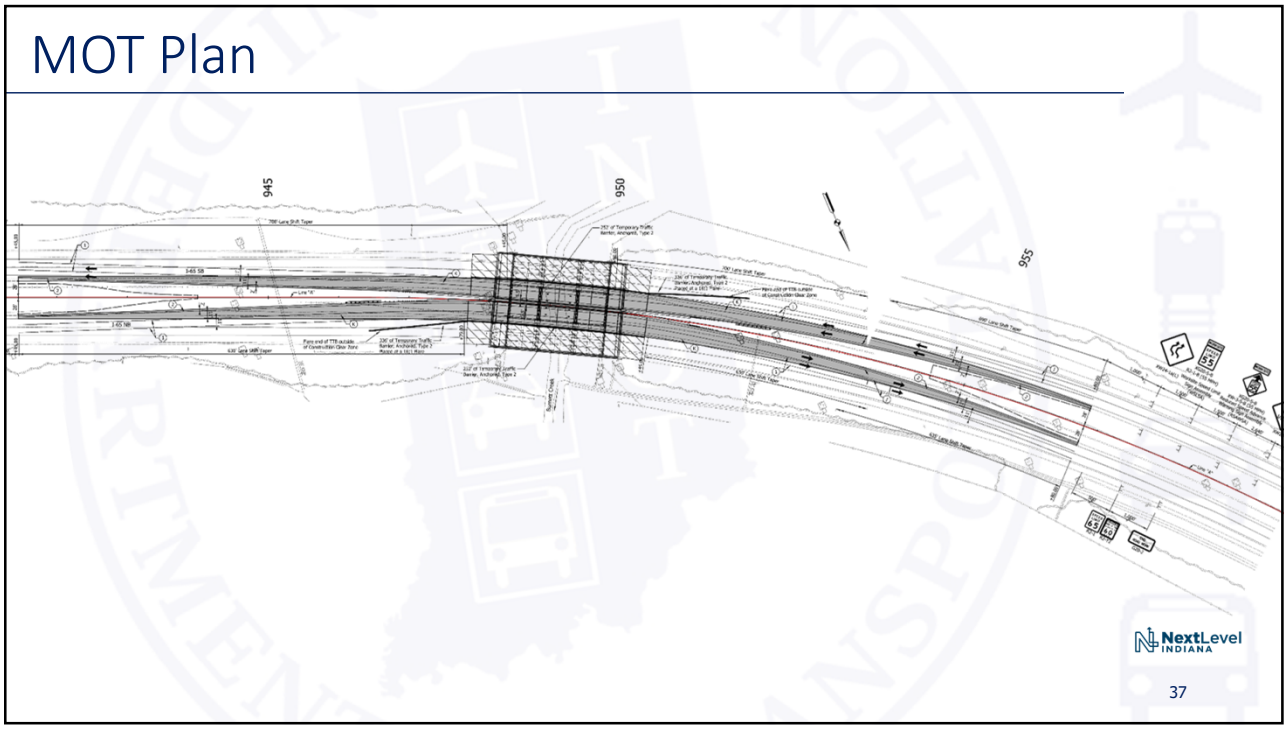
MOT Plan



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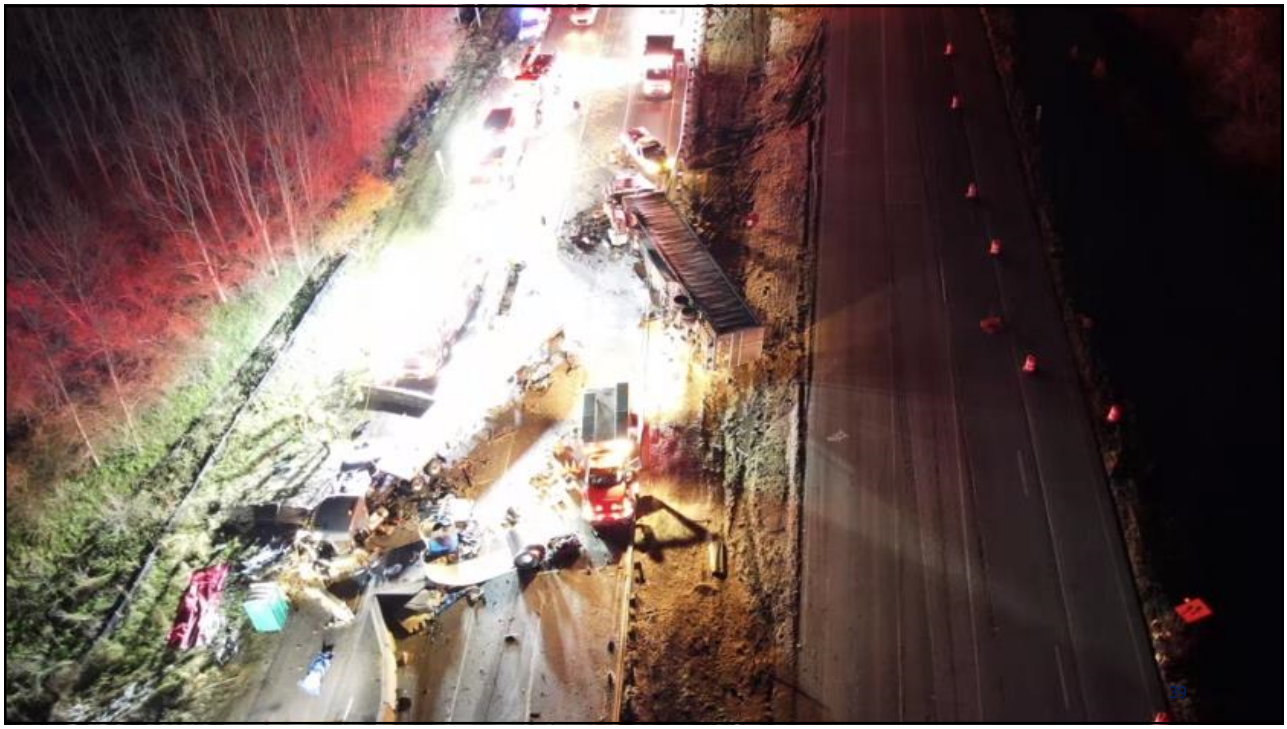

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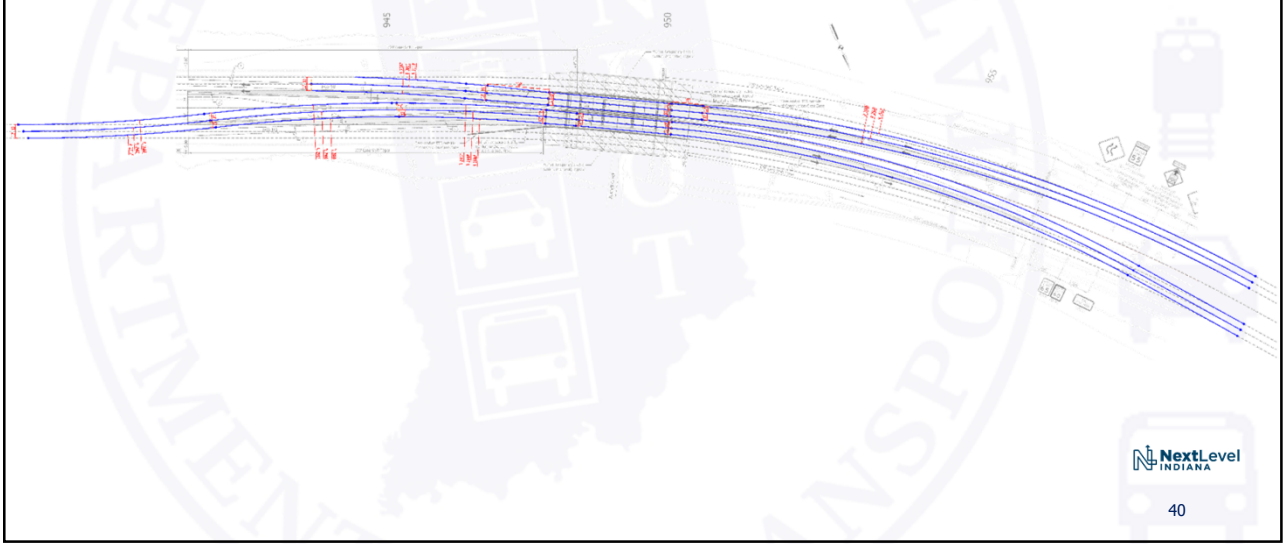
For Consideration



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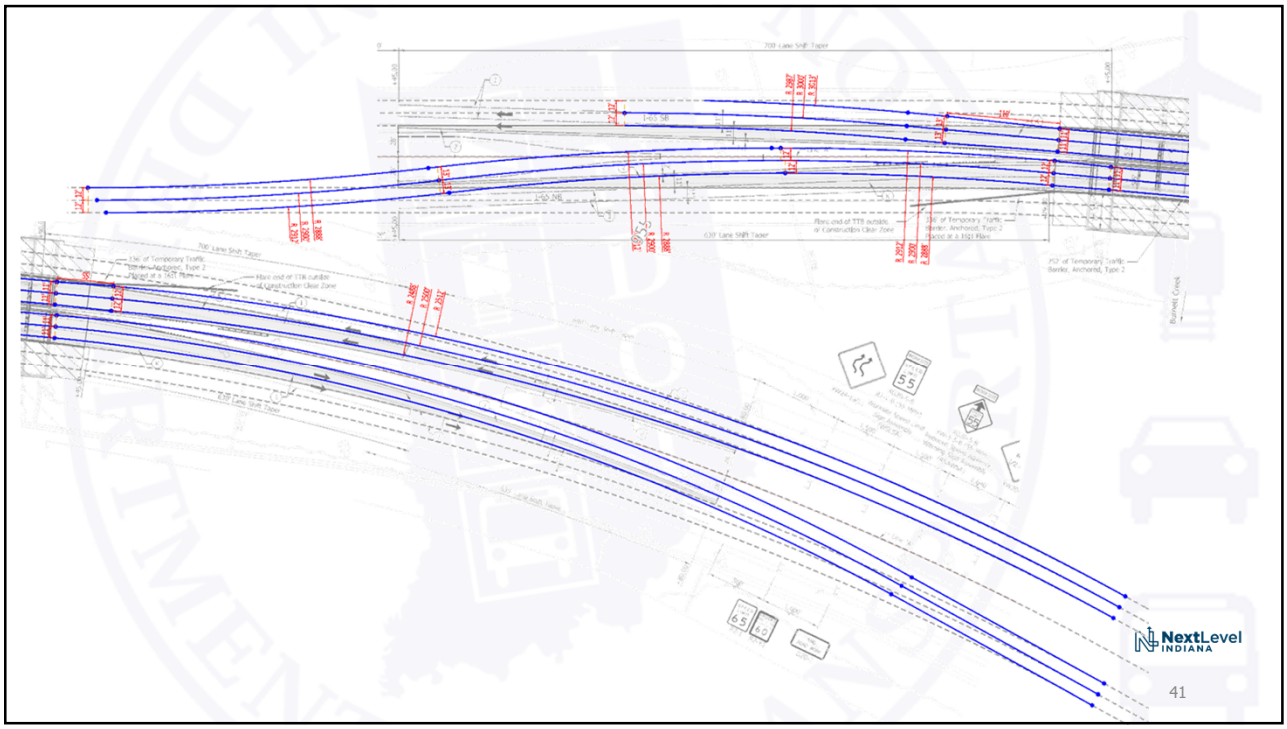

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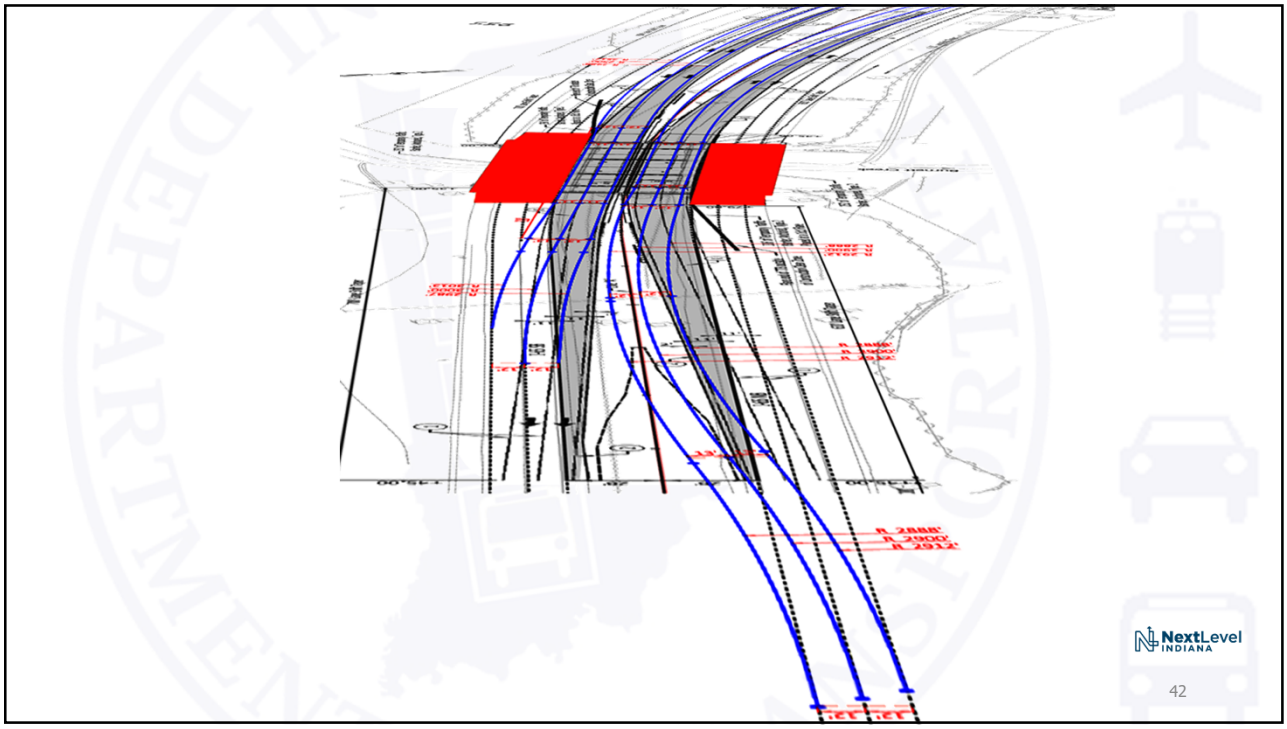

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Recommendations made to address SB direction:

- No changes across the bridge (due to existing construction underway)
- Extends the tangent section that currently exists across the structure at least 100 ft upstream and downstream of the structure.
  → Goal: have trucks aligned in lane prior to bridge and have trajectory across the bridge be a straight line for the driver.
- Provides single radius transitions from the existing lanes to extended tangent section.
  → Goal: provide an easier curve for the motorist to navigate than a spiral curve.
- The downstream curve can be as large and comfortable as the pre-construction curve. Upstream, though, the radius will likely be smaller than the current radius in play at the work zone.
  → Goal is to align traffic on a straight trajectory across the bridge prior to the bridge and to get truck trailers (closer to being) in line with the tractor.
- The radius change may be mitigated by the recommendations made in the prior email: address the speeding; inform the motorist of the curve; delineate the curve well, especially the point of compound curvature where the radius of the pre-construction curve becomes the tighter temporary curve. Also, note that our existing cross over standards (E 801-TCCO-01 → -03), which are for speeds up to 55 MPH require an outside edge line radius of 1,345 ft. I was able to fit a 2,012 ft outside edge line radius upstream and 3,000 ft downstream.

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Recommendations made (cont.):

- Provides 12 ft lane width along the entire length of curve.
  → Goal: make it easier for trucks and other vehicles to stay in their lanes.
- Places lane width reduction and widening transitions along the tangent between the curves and off the bridge.
  → Goal: reduce driver anxiety by separating tasks and also making the narrowing down of the lanes easier.
- Relocate/realign the TCB beyond the bridge to follow the lane width transitions and to provide 2 ft of clearance where the 12 ft lane end and begin, upstream and downstream of the bridge, respectively.
  → Goal: provide room for the realignment and greater lane width through the curves.
- The TCB upstream will need to be shortened and the attenuator relocated.
  → This is due to the realignment of the TCB and to maintain construction access.
- Delineate the outside edge of the curve on the approach to the bridge beginning at the point of compound curvature. This can be accomplished with construction drums and chevrons (W1-8L).
  → Goal: (chevrons) highlight the change of the radius of the compound curve is tightening and (construction drums) to delineate the right edge line along the transition and then the TCB.

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Barrier Transitions

Katherine Smutzer, Work Zone Safety Engineer

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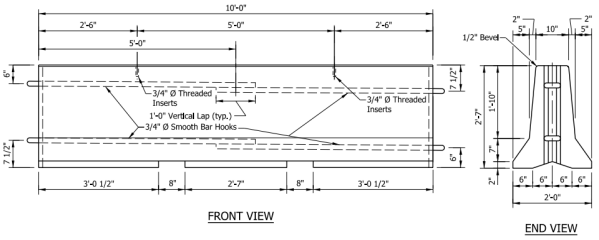
Barrier Transitions

- INDOT Temporary Traffic Barrier is Different than other State DOT Temporary Traffic Barrier.
  - 10 ft segment lengths, rather than 12 ft
  - 31 in. height rather than 32 in.
  - Less Reinforcement
  - Anchored Barrier is only anchored on the work zone side of the barrier. (Good)



- INDOT has just entered into an agreement with a testing facility to test INDOT Temporary Traffic Barrier in the following configurations:
  - Free-Standing
  - Anchorage into Bituminous
  - Transition between Free-Standing and Anchored Barrier.

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Barrier Transitions



- INDOT does not have a crash tested barrier transition between temporary traffic barrier and w-beam guardrail or between temporary traffic barrier and permanent concrete barrier (median or bridge railing).
- Future Testing Request May Include
  - Transitions between Temporary Traffic Barrier and W-Beam Guardrail
  - Transitions between Temporary Traffic Barrier and Permanent Median Barrier and Permanent Bridge Rail

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Barrier Transitions

- Standards for other State DOT temporary traffic barrier transitions should not be used with INDOT temporary traffic barrier.
- These transitions are being tested but not with INDOT Temporary Traffic Barrier

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Barrier Transitions

- Incorrect Transition between TTB and W-Beam Guardrail.
- Incorrect Placement of Type II Temporary Traffic Barrier. The last 40 ft or more will gate and allow a vehicle to get behind the w-beam guardrail. The TTB blunt end is a hazard.

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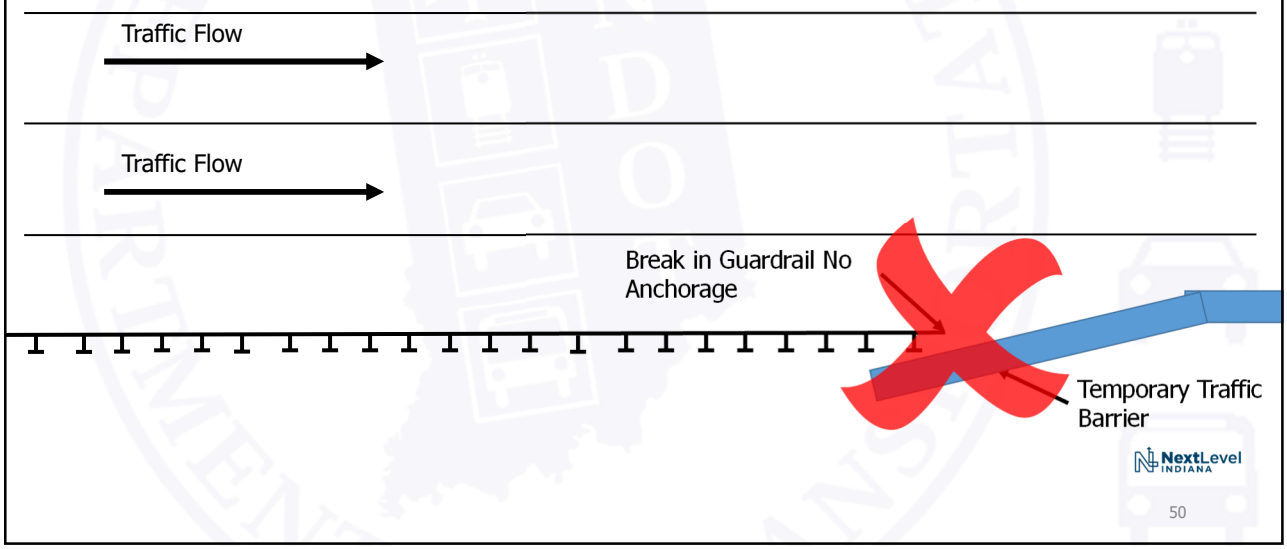
Barrier Transitions

- Original Configuration as shown in the previous photo



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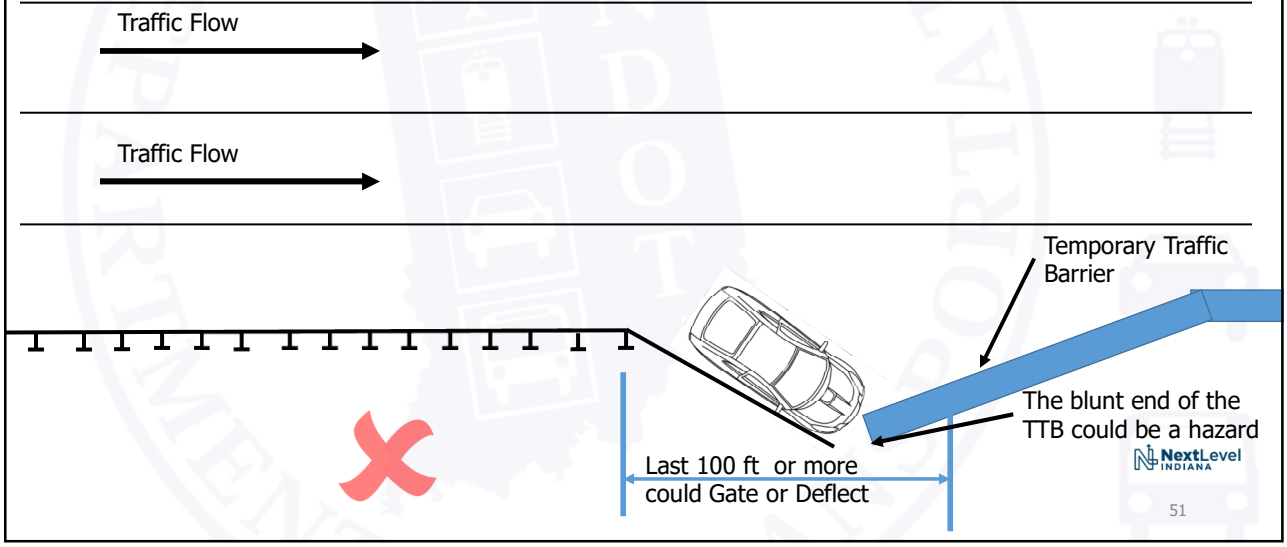
Barrier Transitions

- Possible Gating or Deflection of W-Beam Guardrail Exposing the Blunt End or the TTB



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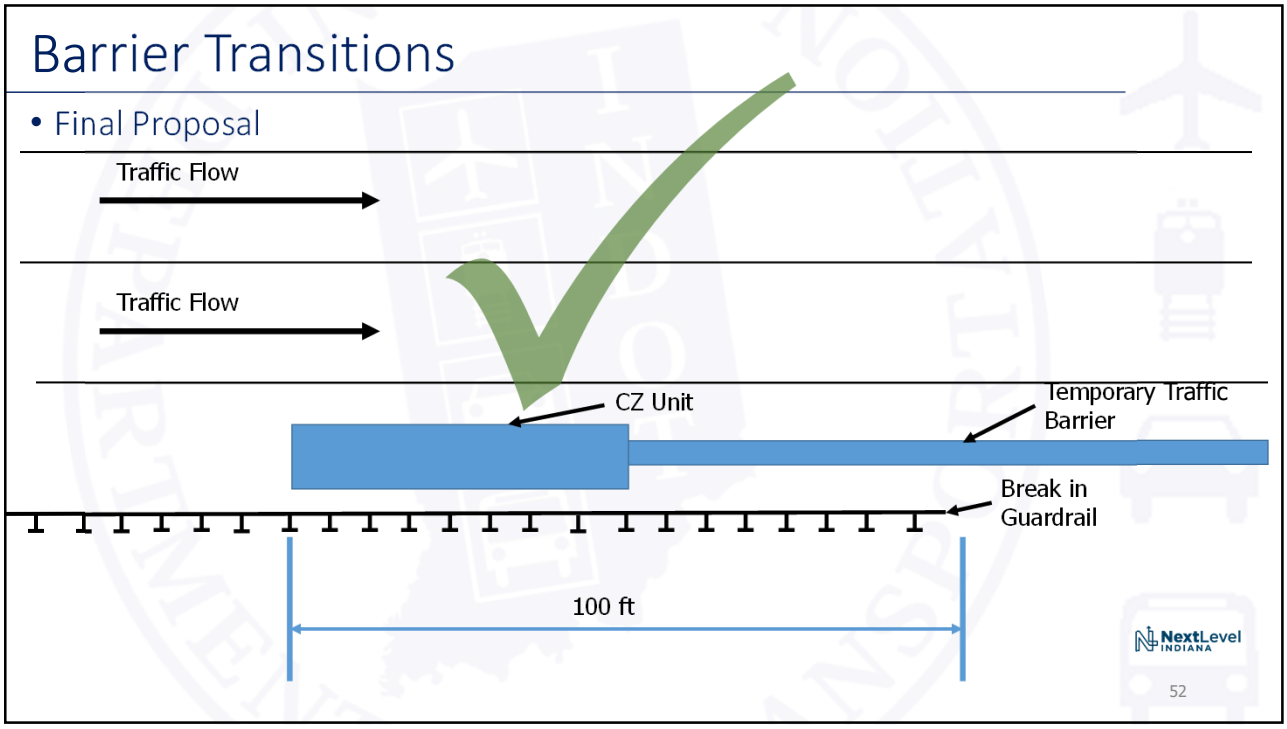
Barrier Transitions

- Final Proposal



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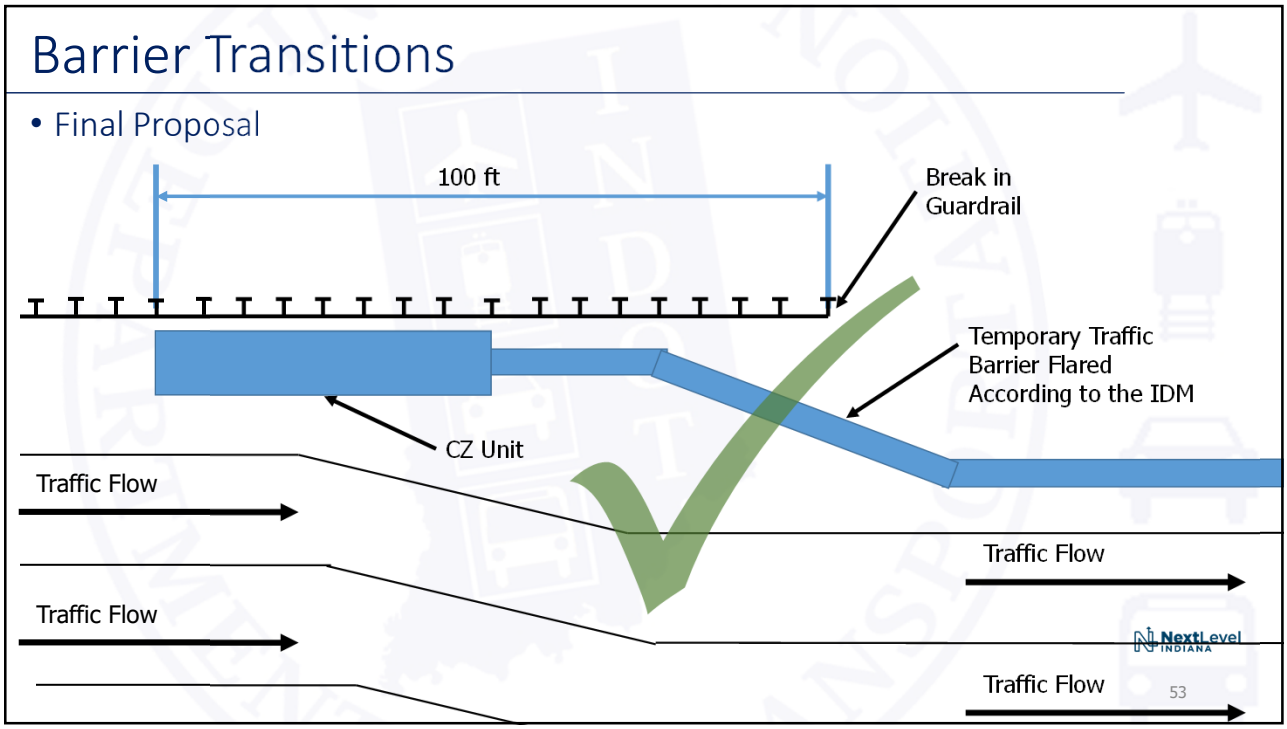
Barrier Transitions
• Final Proposal
100 ft
Break in Guardrail
Temporary Traffic Barrier Flared According to the IDM
CZ Unit
Traffic Flow
Traffic Flow
Traffic Flow
Traffic Flow
NextLevel INDIANA
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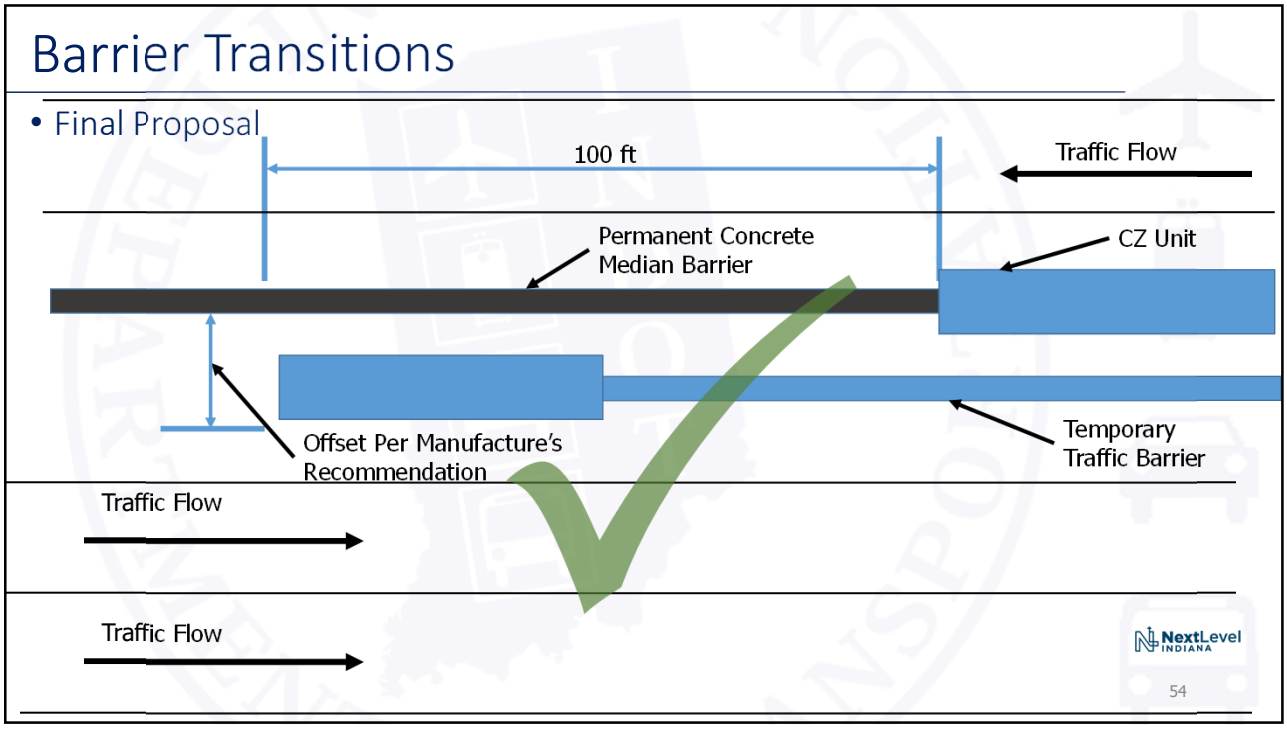
Barrier Transitions
• Final Proposal
100 ft
Traffic Flow
Permanent Concrete Median Barrier
CZ Unit
Offset Per Manufacture's Recommendation
Temporary Traffic Barrier
Traffic Flow
Traffic Flow
NextLevel INDIANA
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Barrier Transitions

- Incorrect Barrier Transition between TTB and W-Beam Guardrail OS End Treatments.

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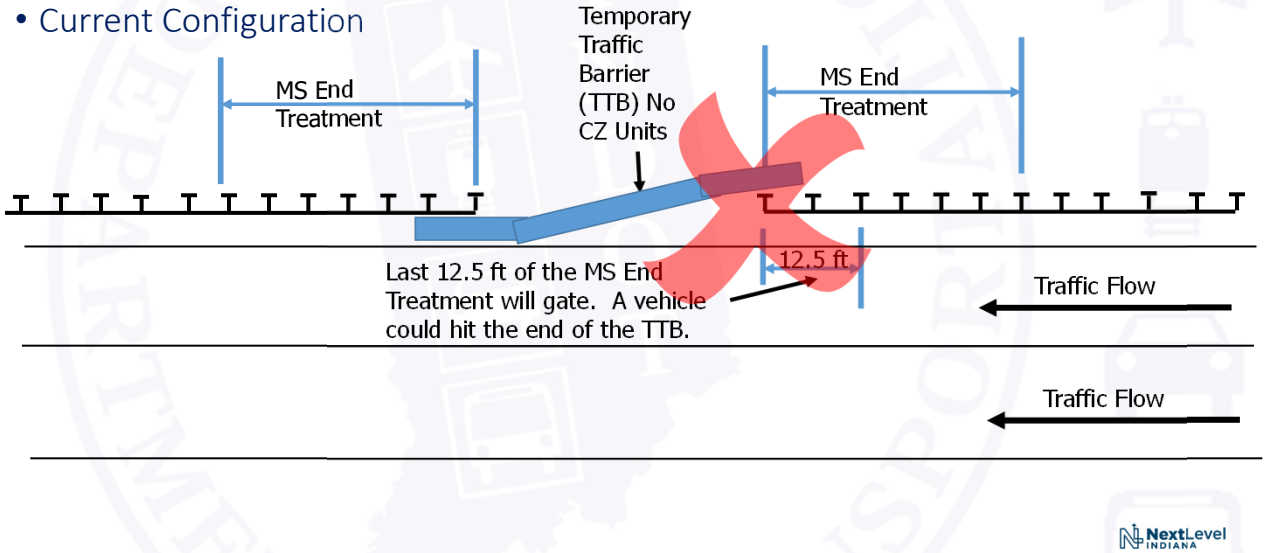
Barrier Transitions

- Current Configuration



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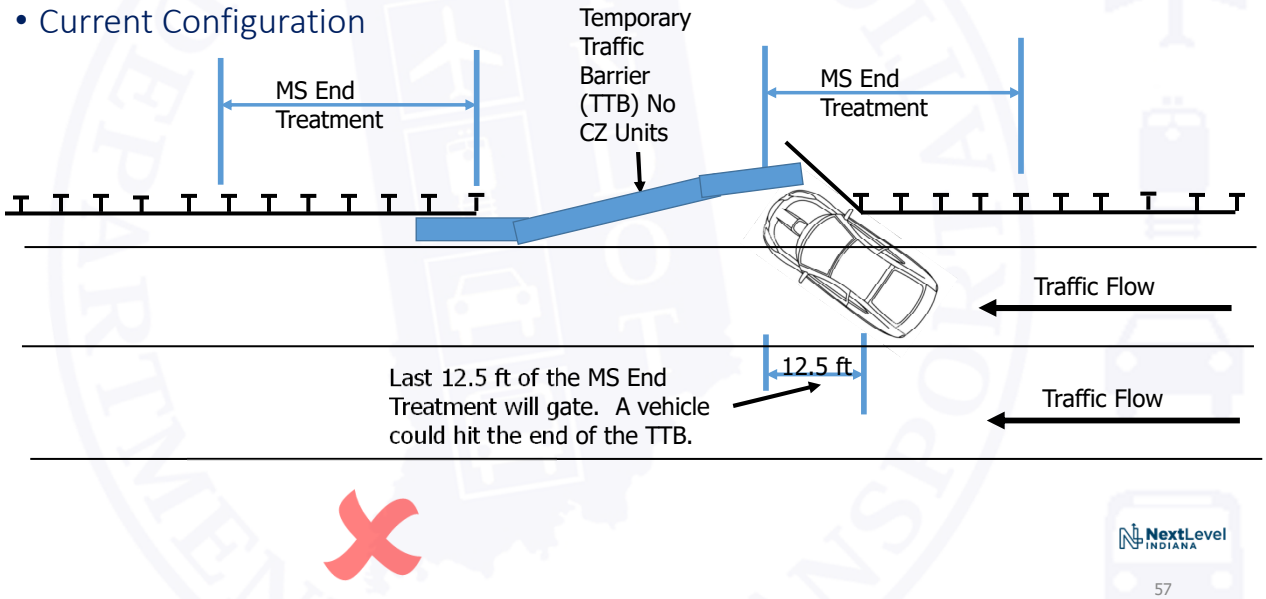
Barrier Transitions

- Current Configuration



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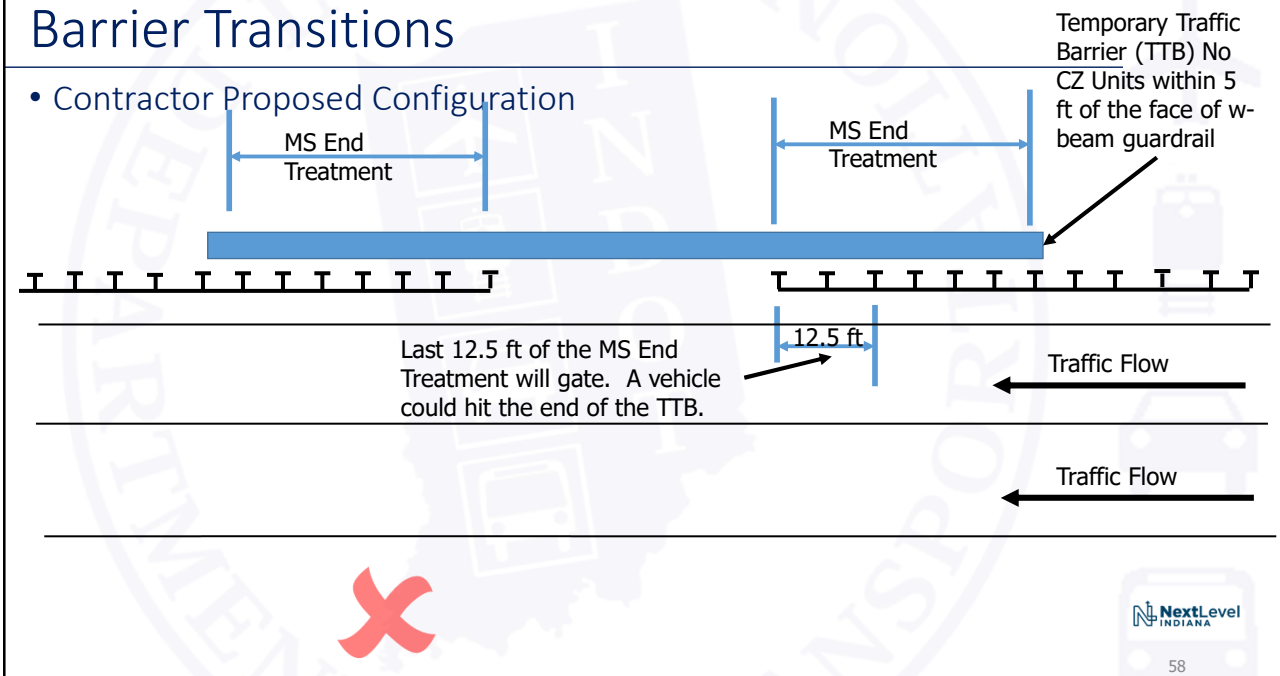
Barrier Transitions

- Contractor Proposed Configuration



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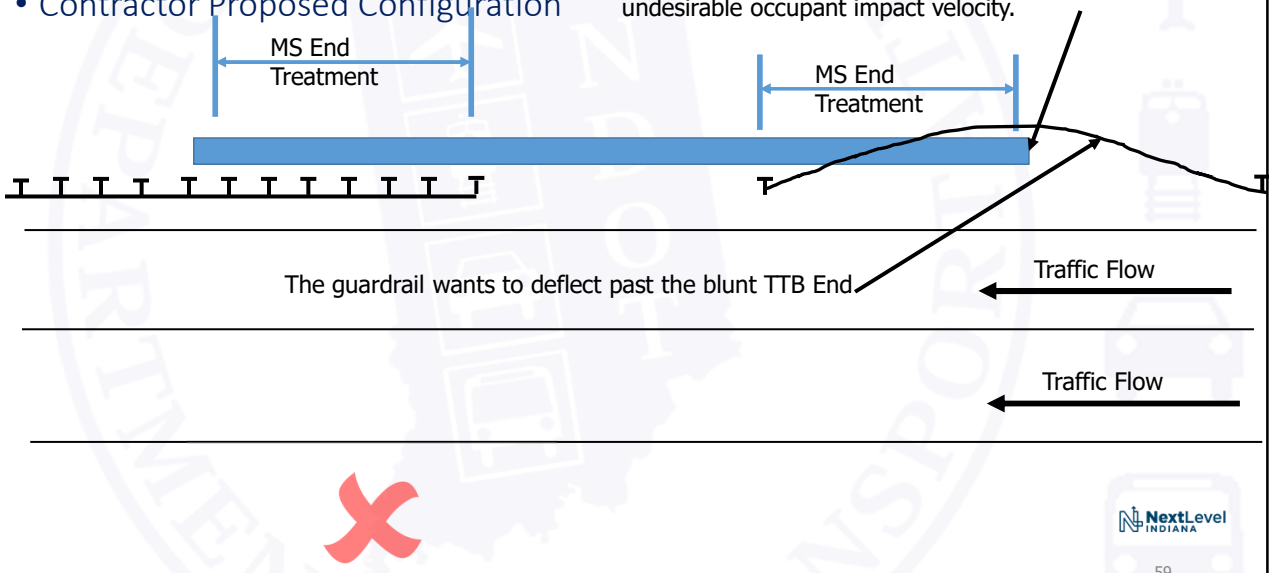
Barrier Transitions

- Contractor Proposed Configuration

The blunt TTB end is within the deflection area of the guardrail and the guardrail will not be able to deflect as designed, stopping a car more suddenly imposing undesirable occupant impact velocity.



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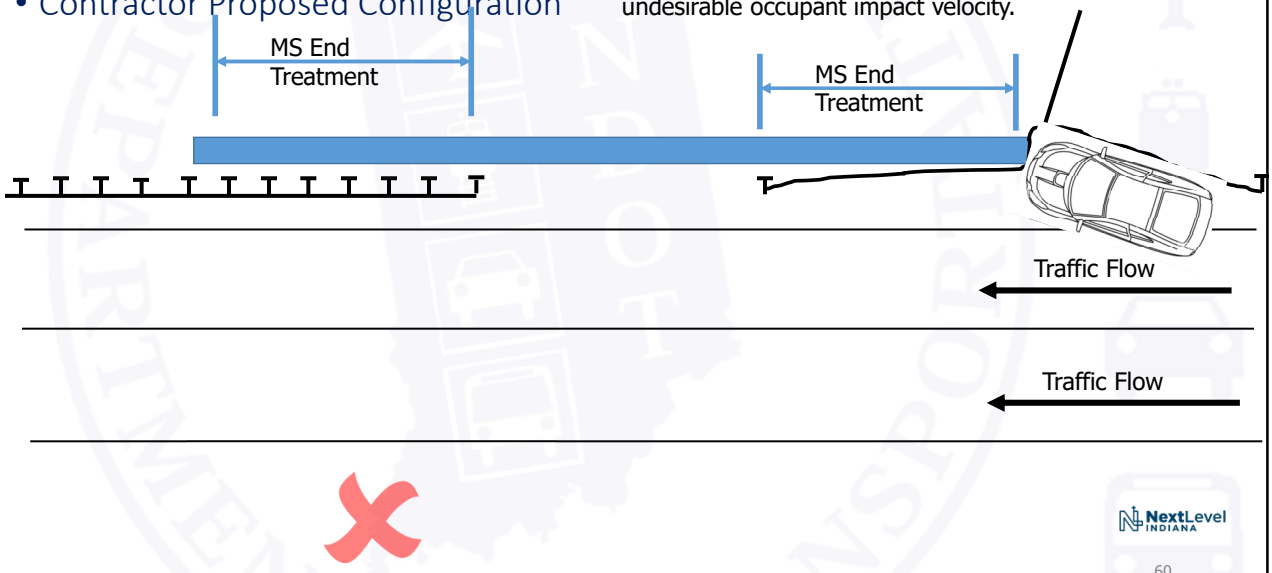
Barrier Transitions

- Contractor Proposed Configuration

The blunt TTB end is within the deflection area of the guardrail and the guardrail will not be able to deflect as designed, stopping a car more suddenly imposing undesirable occupant impact velocity.



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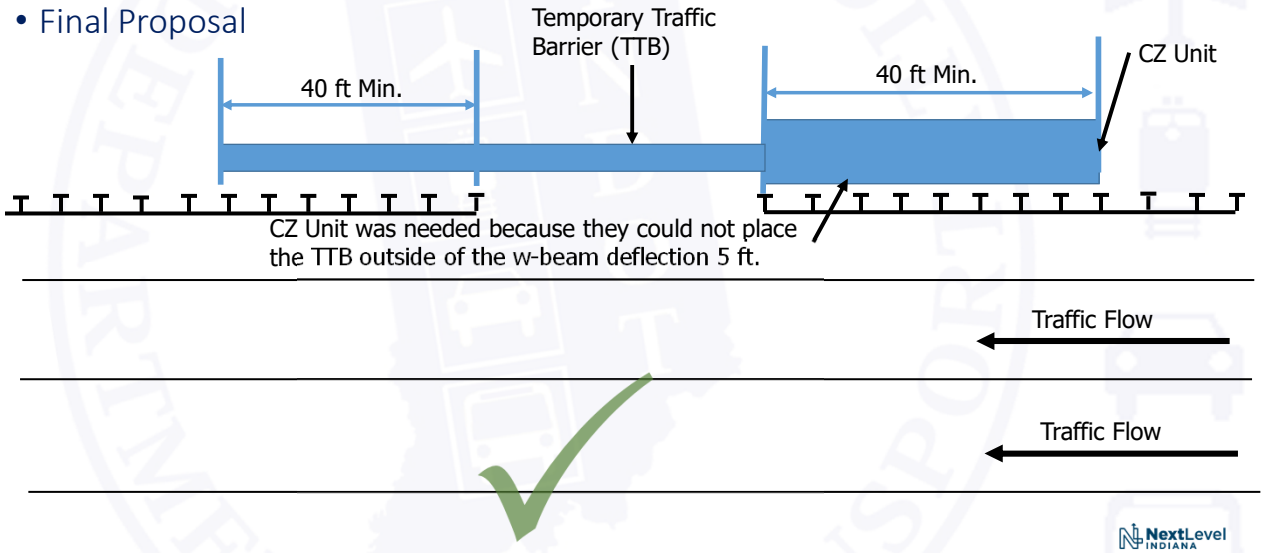
Barrier Transitions

- Final Proposal



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Questions

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