Meeting Minutes
Markings Technical Committee
National Committee on Uniform Traffic Control Devices
June 18-21, 2008, Mobile, AL

June 18, 1:00 PM – 6:30 PM; June 19, 8:00 AM – 5:00 PM; June 20, 1:15 PM – 4:30 PM

A. Call to order (Gene Hawkins)
   1. Distribution of attendance rosters (member and visitor).

B. Committee Business
   1. Minutes approved from January meeting (June 18).
   2. Tim Taylor gave Edit Committee report (June 18).
   3. MTC approved (unanimous) moving all definitions to Part 1 (June 18).
   4. Gene announced he is now chair of ITE Delegation (Executive Committee met from 5-7 PM on June 18; Dave Woodin acted as chair during this time).
   5. MTC approved of Toll Task Force Changes to Sections 3A.04, 3B.24, 3B.25, and 3B.29 (June 18).
   6. Discussion on controversial issues for markings section (June 19):
      a. 5-year compliance period
      b. Double lines on rumble strips
      c. Dotted lines at entrance and exit ramps
   7. Gene H. distributed systems engineering survey for research project (June 19).
   8. Developed an outline for reorganizing Chapter 3B.
   9. Retrorreflectivity Task Force – Tim Taylor gave report (June 19). Straw vote on the concept – passed (with two abstentions). Will go to sponsors after the meeting.
   10. Discussion of need for supplemental rule.

C. Review of Chapter 3A
   1. 3A.01 – No new action.
   2. 3A.02 – No new action.
   3. 3A.03 – No new action.
   4. 3A.04 – MTC approved the following changes (Scott Thorson task and toll task force):

      **Standard:**

      *Markings shall be yellow, white, red, or blue, or purple.* The colors for markings shall conform to the standard highway colors. Black in conjunction with one of the above colors shall be a usable color.

   ...
When used, red raised pavement markers or delineators shall delineate truck escape ramps, and one-way roadways or ramps that shall not be entered, or used in the direction from which the markers are visible or travel lanes such that the color red is visible to traffic proceeding in the wrong direction.

When used, blue markings shall supplement white markings for parking spaces for persons with disabilities.

Support:

Blue raised pavement markers can be used to indicate locations of fire hydrants along a roadway.

Standard:

When used, purple markings shall supplement lane line or edge line markings for toll plaza approach lanes that are used only by vehicles that are equipped for electronic toll collection (ETC) (see Section 3B.29).

Option:

Appropriate colors may be used in a route shield pavement marking symbol, such as red, white, and blue for an Interstate highway route shield pavement marking and colors that closely resemble a state’s sign route shield (see Figure 3B-25).

MTC also approved modifying Figure 3B-25 to show two adding two examples for pavement route shields: Black on White and State Shield.

5. 3A.05 – MTC approved the following changes:

Support:

Dotted lines are used to extend lines through intersections or interchanges. Dotted lines are also used to provide guidance at acceleration, deceleration, auxiliary lanes, and lane drops. instead of broken lane lines to separate a continuing lane from a non-continuing lane, such as acceleration or deceleration lanes, auxiliary lanes, lane drops, and lane reductions.

Option Guidance:

A dotted line for line extensions within an intersection or taper area should consist of 0.6 m (2 ft) line segments and 0.6 m (2 ft) to 1.8 m (6 ft) gaps. A dotted line for lane drop/add markings used as a lane line to separate a through or optional lane from a lane drop continuing lane from a non-continuing lane may should consist of 0.9 m (3 ft) line segments and 2.7 m (9 ft) gaps.

6. 3A.06 – No new action.

D. Review of Chapter 3B

1. 3B.01 - MTC approved of NPA changes. Two additional changes:

Task from Tim Taylor – inconsistencies of double line wording. Editorial changes to the second Standard:

Standard:
The centerline center mass markings on two-lane, two-way roadways shall be one of the following as shown in Figure 3B-1:

A. Two-direction passing zone markings consisting of a normal broken yellow line where crossing the centerline center line markings for passing with care is permitted for traffic traveling in either direction;

B. One-direction no-passing zone markings consisting of a double yellow line of which one is a normal broken yellow line and the other is a normal solid yellow line where crossing the centerline center line markings for passing with care is permitted for the traffic traveling adjacent to the broken line, but is prohibited for traffic traveling adjacent to the solid line; edited to increase accuracy

C. Two-direction no-passing zone markings consisting of a double two normal solid yellow lines where crossing the centerline center line markings for passing is prohibited for traffic traveling in either direction.

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Task from Dave Woodin. Added text after first Support statement:

Section 11-301(c) does not prohibit the crossing of the center line on an undivided highway in making a left turn into or from an alley, private road or driveway when it is done with care.

2. 3B.02- MTC approved of NPA changes as well as change below:

Jim Ellison task. Reason is to be consistent with AASHTO Green Book. Edit to first Support statement:

The values of the minimum passing sight distances that are shown in Table 3B-1 are for operational use in marking no-passing zones and are less than the values that are recommended for the geometric designs of highways.

3. 3B.03. - MTC approved of NPA changes. One additional change under Guidance:

A white two-way left-turn arrow pavement marking, with opposing arrows spaced as shown in Figure 3B-7, should be used in conjunction with the longitudinal two-way left-turn markings as shown in Figure 3B-7 at or just downstream from the upstream end of the two-way left-turn lane and at other locations along the two-way left-turn lane where engineering judgment determines that such additional markings are needed to emphasize the proper use of the lane.

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ED NOTE: FHWA has put language about white arrows in the section dealing with yellow longitudinal markings.

4. 3B.04 - MTC approved of following changes:

Standard:

Except as noted below in the next paragraph, where crossing the lane line markings with care is permitted, the lane line markings shall consist of a normal broken white line.
On an approach to or a departure from an interchange or intersection, a dotted white line broken white lane line marking shall not be used as the lane line to separate a through lane that continues beyond the interchange or intersection from an adjacent lane for any of the following conditions types:

A. A through lane that becomes a mandatory exit or turn lane.
B. An auxiliary lane 3.2 km (2 mi) or less in length between an entrance ramp and an exit ramp.
C. An auxiliary lane 1.6 km (1 mi) or less in length between two or more adjacent intersections, or
D. An acceleration or deceleration lane.

For the conditions listed in the previous paragraph, a dotted white line shall be used as the lane line.

Option:

For entrance ramps with a tapered acceleration lane, lane line markings may be placed to extend the channelizing line, but not beyond a point where the tapered lane meets the near side of the through traffic lane. A dotted white line extension may be installed from the through lane channelizing line theoretical gore to the downstream end of the acceleration taper, as shown in Drawing B and C of Figure 3B-9.

Guidance:

A normal dotted white line should be used as a lane drop marking for lane reduction transitions (see Section 3B.09 and Figure 3B-13).

Option:

Where lane changes might cause conflicts, a wide solid white channelizing lane line may extend upstream from the theoretical gore point of a multilane exit ramp or for multi-lane exits, as shown in Drawing B of Figure 3B-10.

Standard:

Where crossing the lane line markings is discouraged, the lane line markings shall consist of a normal solid white line.

Guidance:

On approaches to intersections, a solid white lane line marking should be used to separate a through lane from an added mandatory turn lane. For a lane drop at an intersection, a solid white lane line marking should be used to separate the dropped lane from the adjacent through lane for a distance upstream of the intersection as determined by engineering judgment (see Drawing C of Figure 3B-10).

Standard:

Where crossing the lane line markings is prohibited, the lane line markings shall consist of a double two normal solid white lines (see Figure 3B-11).
ED NOTE: There is some repetitive text in this section that needs to be cleaned up – descriptions of dotted white lanes and lane drop markings.
ED NOTE: Concern about language not being consistent. Need clarity for continuing vs. non-continuing lane. Lane drop marking is not defined.

Concept: A dotted line provides guidance to the driver in an area where it would be inappropriate to use a solid line or broken line. Straw vote: Approved.

MTC approved to modify Figure 3B-9. Add a Figure 3B-9(C) that shows the optional extension of the channelizing line to the theoretical gore for tapered ramps. Figure 3B-9(B) should show a dimension “B” (distance between physical and theoretical gore) and a “1/2 B” – optional to use channelizing line or or dotted line past ½ B.

Discussion: For lane reduction situation, use of dotted line is optional. Lane use arrows should be used for 45 mph or more.

FUTURE TASK: Look at developing a new action sign to get drivers to merge (Fig. 3B-13).

5. 3B.05 - MTC approved of following changes:

   **Standard:**
   
   For exit and entrance ramps, channelizing lines shall be placed along the on both sides of the neutral area adjacent to the through traffic lane and the ramp lane.
   
   For exit ramps, the channelizing lines for the ramp and through lanes shall begin at the theoretical gore and extend downstream on each side of the neutral area to the physical gore.
   
   For parallel entrance ramps, the channelizing lines for the ramp and through lanes shall begin at the physical gore and extend downstream on each side of the neutral area to the theoretical gore.
   
   For tapered entrance ramps, the channelizing lines for the ramp and through lanes shall begin at the physical gore and extend downstream on each side of the neutral area at least one-half the distance to the theoretical gore.

   **Option:**
   
   For tapered entrance ramps, white channelizing lines may extend to the theoretical gore as shown in Figure 3B-9C.

6. 3B.06 - MTC approved of NPA changes.

7. 3B.07 - MTC approved of NPA changes, plus one additional change:

   Under Option, text change:
   
   If a bicycle lane is marked on the outside portion of the traveled way, the edge line that would mark the outside right-hand edge of the bicycle lane may be omitted.

8. 3B.08 - MTC approved of NPA changes.
9. 3B.09 – MTC approved the following changes:

Guidance:

*Broken* lane line markings should be discontinued one-quarter of the distance downstream of between at the Lane Ends sign (see Section 2C.41) and a dotted lane drop marking (see Section 3A.05) should be used to extend the lane line to the point where upstream end of the transition taper begins.

*Except as noted in the Option above for low-speed urban roadways, the* edge line markings shown in Figure 3B-13 should be installed at from the location of the Lane Ends warning sign and extend downstream to beyond the end of the transition taper beginning of the narrower roadway.

Option:

*A dotted line may be used instead of a broken line from ¾D upstream the Lane Ends sign to ¼D downstream of the Lane Ends sign.*

MTC approved modifying Figure 3B-13 to match new text.

10. 3B.10 – MTC approved Toll Task Force text changes:

Standard:

*Pavement markings shall be used to guide traffic away from fixed obstructions within a paved roadway, including toll islands booths at toll plazas.* Approach markings for bridge supports, refuge islands, median islands, and raised channelization islands shall consist of a tapered line or lines extending from the centerline center line or the lane line to a point 0.3 to 0.6 m (1 to 2 ft) to the right-hand side, or to both sides, of the approach end of the obstruction (see Figure 3B-14).

Support:

See Section 3B.29 for information on approach markings for toll islands.

11. 3B.11 – MTC approved the following changes:

Standard:

*A raised pavement marker shall be a device with a height of at least 10 mm (0.4 in) mounted on or in a road surface that has a height generally not exceeding approximately 25 mm (1 in) above the road surface for a permanent marker, or 50 mm (2 in) above the road surface for a temporary flexible marker, and that is intended to be used as a positioning guide and/or to supplement or substitute for pavement markings or to mark the position of a fire hydrant.*

... Option:

*Blue raised pavement markers may be used to mark the positions of fire hydrants.*

*The side of a raised pavement marker that is visible to traffic proceeding in the wrong direction of a one-way roadway or ramp may be red.* Relocated from Section 3B.14 and modified by adding “of a one-way roadway or ramp.”
Support:

*Blue raised pavement markers can be used to indicate locations of fire hydrants along a roadway.*

Guidance:

Where additional emphasis is needed, as determined by engineering judgment or engineering study, consideration should be given to spacing retroreflective raised pavement markers more closely together than the maximum spacings recommended or required in Sections 3B.12 through 3B.14.

Option:

Retroreflective raised pavement markers may be spaced closer than described in Sections 3B.12 through 3B.14, as determined by engineering judgment or engineering study.

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ED NOTE: Also make similar change in definition section of NPA – NEED additional text change by FHWA.

ED NOTE: Retroreflective raised pavement markers may be spaced closer more closely together than the maximum spacings recommended or required in Sections 3B.12 – NEED additional text change by FHWA.

Discussion: Straw vote – approve of red/white RPM along an edge line (passed with nays).

12. 3B.12 – No new action.

13. 3B.13. – MTC approved change below (allows Red/White RPM’s on edge lines):

Guidance:

The use of retroreflective or internally illuminated raised pavement markers for supplementing longitudinal line markings should conform to comply with the following:

... Longitudinal Spacing

1. When supplementing solid line markings, raised pavement markers at a spacing no greater than \( N \) (see Section 3B.11) should be used, except that when supplementing channelizing lines or left edge line markings, a spacing of no greater than \( N/2 \) should be used. Raised markers should not supplement right edge line markings.

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ED NOTE: Ignore recommendation by MTC in January 2008 to modify Option statement. It is acceptable as proposed in the NPA.

15. 3B.15 – No new action.
16. 3B.16 – No new action. Gene H. to discuss 20’-50’ advance placement of yield lines with R/W committee.
17. 3B.17 – No new action. Previously approved Figure 3B-17 modification to add Option C2 – one big “X” in box for Do Not Block Intersection.
18. 3B.18 – No new action.
19. 3B.19 – No new action.
20. 3B.20 – MTC approved the following changes:
   Guidance:
   Lane-use arrows (see Figure 3B-24) should be used in lanes designated for the exclusive use of a turning movement, including turn bays, except where engineering judgment determines that physical conditions or other markings (such as a dotted extension of the lane line through the taper into the turn bay) clearly discourage unintentional use of a turn bay by through vehicles. Lane-use arrows should also be used in lanes from which movements are allowed that are contrary to the normal rules of the road (see Drawing B of Figure 3B-12). An arrow should be used at the upstream end of the full-width turn lane. When used in turn lanes, at least two arrows should be used, one at or just downstream from the upstream end of the full width turn lane and one 6.1 to 15 m (20 to 50 ft) upstream from the stop line or intersection (see Drawing C of Figure 3B-10). Where opposing offset channelized left-turn lanes exist, lane-use arrows should be placed near the downstream terminus of the offset left-turn lanes to reduce wrong-way movements (see Figure 2B-20).
   Option:
   An additional arrow or arrows may be used in a turn lane (see Drawing C of Figure 3B-10).
   Support
   An arrow at the downstream end of a turn lane can help to prevent wrong way movement.

   Option:
   On freeways or expressways where a through lane becomes a mandatory exit lane, lane-use arrow markings may be used in the optional and/or lane drop dropped lane on the approach to the exit.

ED NOTE: MTC recommends that FHWA develop a standard arrow design for use on freeway to indicate an optional lane or a lane drop or deceleration lane.
21. 3B.21 - No new action.
22. 3B.22 – MTC approved changes below:
   Support:
   Speed reduction markings (see Figure 3B-30) are transverse markings that are placed on the roadway within a lane (along both edges of the lane) in a pattern of
progressively reduced spacing to give drivers the impression that their speed is increasing. These markings might be placed in advance of an unexpectedly severe horizontal or vertical curve or other roadway feature where drivers need to decelerate prior to reaching the feature and where the desired reduction in speeds has not been achieved by the installation of warning signs and/or other traffic control devices.

... Guidance:

Speed reduction markings should be used to supplement the appropriate warning signs and other traffic control devices rather than as a substitute for these devices.

Guidance: Speed reduction markings should be reserved for unexpected curves and should not be used on long tangent sections of roadway or in areas frequented mainly by local or familiar drivers, (e.g., school zones).

23. 3B.23 – No new action.

24. 3B.24 – MTC approved all Toll Task Force changes.

Motion approved: Comment to FHWA – The word TRANSIT does not fit in a single lane (F. under Standard). FHWA to address.

25. 3B.25 – MTC approved all Toll Task Force changes.

Discussion with Scott Wainwright of FHWA – scaling of some of the lines (Fig. 3B-34) looks off. He said it would be impossible to show the proper width of lines in relation to road widths because they would be too small to see differences between the lines.

26. 3B. 26 – MTC approved text changes below:

Section 3B.26 Chevron and Diagonal Crosshatching Markings

Option:

Chevron and diagonal crosshatching markings may be used to discourage travel on certain paved areas, such as shoulders, gore areas, neutral areas between double solid yellow center line markings approaching obstructions in the roadway (see Section 3B.10 and Figure 3B-14), neutral areas between double solid yellow center line markings forming flush medians or channelized travel paths at intersections (see Figures 3B-2 and 3B-5), and buffer spaces between preferential lanes and general purpose lanes (see Figures 3B-32 and 3B-34).

Standard:

When chevron crosshatching markings are used in paved areas that separate traffic flows in the same general direction, they shall be white and they shall be shaped as chevron markings, with the point of each chevron facing towards approaching traffic and with the diagonal lines that form the chevron slanting such that the downstream ends of the lines intersect the longitudinal lines at the edges of the adjacent travel lanes (see Figures 3B-8, 3B-11, and 3B-14, Sheet 2 of 2).

When diagonal crosshatching markings are used in paved areas that separate opposing directions of traffic, they shall be yellow and diagonal markings that slant such that the downstream ends of the lines intersect the longitudinal lines at the edges of the adjacent travel lanes (see Figures 3B-5 and 3B-14, Sheet 1 of 2).
When diagonal crosshatching markings are used on paved shoulders, they shall be diagonal markings that slant such that the downstream ends of the lines intersect the edge line of the adjacent travel lane. The diagonal markings shall be yellow when used on the left-hand shoulders of the roadways of divided highways and on the left-hand shoulders of one-way streets or ramps. The diagonal markings shall be white when used on right-hand shoulders.

**Guidance:**

Chevron and diagonal lines used for crosshatching markings should be at least 300 mm (12 in) wide for roadways having a posted or statutory speed limit of 70 km/h (45 mph) or greater, and at least 200 mm (8 in) for roadways having posted or statutory speed limit of less than 70 km/h (45 mph). The longitudinal spacing of the chevron or diagonal lines should be determined by engineering judgment considering factors such as speeds and desired visual impacts. The chevron and diagonal lines should form an angle of approximately 45 degrees with the longitudinal lines that they intersect.

27. 3B.27 – MTC approved NPA changes.
28. 3B.28 – MTC approved NPA changes.
29. 3B.29 – MTC approved all Toll Task Force changes.

E. Review of Chapter 3C – No new action.

F. Review of Chapter 3D – No new action.

G. Review of Chapter 3E – No new action.

H. Review of Chapter 3F – MTC approved changes below:

**CHAPTER 3F. BARRICADES AND BARRICADES RELOCATED TO SECTION 2L.05 CHANNELIZING DEVICES USED FOR EMPHASIS OF PAVEMENT MARKING PATTERNS**

**Section 3F.01 Channelizing Devices**

**Option:**

Channelizing devices, as described in Sections 6F.61, 6F.62, 6F.63, and 6F.64, and shown in Figures 6F-7, such as traffic cones, tubular markers, vertical panels, drums, and raised islands, may be used for general traffic control purposes such as adding emphasis to reversible lane delineation, channelizing lines, or islands. Channelizing devices may also be used along the center line of an undivided highway to preclude turns or along lane lines to preclude lane changing, as determined by engineering judgment.

**Standard:**

Except for color, the design of channelizing devices, including retroreflectivity, shall conform to comply with the provisions of Sections 6F.67, 6F.68, and 6F.69. Channelizing devices shall be a minimum of 450 mm (18 in) in height.
The minimum height of channelizing devices added to increase accuracy shall be 700 mm (28 in) for use on freeways and other high-speed roadways, and on all facilities when used during hours of darkness or whenever more conspicuous guidance is needed.

The color of channelizing devices used outside of temporary traffic control zones shall be either orange or the same color as the pavement marking that they supplement, or for which they are substituted.

For nighttime use, channelizing devices shall be retroreflective (as described in Part 6) or internally illuminated. Bands on channelizing devices separating traffic flows in the same direction shall be white. Bands on channelizing devices separating traffic flows in the opposite direction and on the left side of one way/divided roadway shall be yellow. Except for the bands on channelizing devices that are used to separate traffic flows in opposing directions, the color of the retroreflective bands on channelizing devices shall be white. The bands on channelizing devices that are used to separate traffic flows in opposing directions shall be yellow.

Retroreflective material shall have a smooth, sealed outer surface that will display a similar color during both day and night.

I. Review of Chapter 3G – MTC approved Toll Task Force changes.

J. Review of Chapter 3H – MTC approved the changes below:

   Standard:

   If used, the edge line or center line associated with a longitudinal rumble stripe shall be white for the right-hand edge of the roadway, yellow for the left-hand edge of the roadways of divided and one-way highways and ramps, and yellow for the separation of traffic traveling in opposite directions. An edge line shall not be used in addition to a rumble stripe that is located along a shoulder. Figure 3H-1 illustrates markings used with or near rumble strips.

MTC approved new figure – Figure 3H-1. ED NOTE: One change to proposed figure (still needs to be done) - Change proposed figure 3H-1(C) – in the note, “Dashed Center Line” should be “Broken Center Line.”

K. Review of Chapter 7C – School Markings

1. 7C.01 – MTC approved as proposed in NPA.
2. 7C.02 – MTC approved as proposed in NPA.
3. 7C.03 – MTC approved as proposed in NPA with the following change:

   Because nonintersection school crossings are generally unexpected by the road user, warning signs (see Sections 7B.10 and 7B.11) should be installed for all marked school crosswalks at nonintersection locations. Adequate visibility of students by approaching motorists and of approaching motorists by students should be provided by parking prohibitions or other appropriate measures.
4. 7C.04 – MTC approved as proposed in NPA.
5. 7C.05 – MTC approved as proposed in NPA.
6. 7C.06 – MTC approved as proposed in NPA.

L. Review of Section 1A.13
   1. MTC approved the following changes:
      7. Barrier-Separated Lane—a preferential lane or other special purpose lane (ED
         NOTE: use “managed lane” instead of “other special purpose lane.”) that is separated
         from the adjacent general purpose lane(s) by a physical barrier.
      12. Buffer-Separated Lane—a preferential lane or other special purpose lane (ED
         NOTE: use “managed lane” instead of “other special purpose lane.”) that is separated
         from the adjacent general purpose lane(s) by a pattern of standard longitudinal
         pavement markings that is wider than a normal or wide lane line marking. The buffer
         area might include channelizing devices such as tubular markers or traversable curbs,
         but does not include a physical barrier.

      81. Raised Pavement Marker—a device with a height of at least 10 mm (0.4 in)
         mounted on or in a road surface that has a height generally not exceeding
         approximately 25 mm (1 in) above the road surface for a permanent marker, or 50 mm
         (2 in) above the road surface for a temporary flexible marker, and that is intended to be
         used as a positioning guide and/or to supplement or substitute for pavement markings
         or to mark the position of a fire hydrant.

M. Review of Chapter 3 Figures
   3A – no figures.

   3B
   1. okay
   2. Removed asterisks on upstream arrow (two places)
   3. okay
   4. okay
   5. okay
   6. okay
   7. See Jan. comments
   8. See Jan. comments. Also, take out the word “point”
   9(a) – dimension “A” line needs to come all the way across
   9(b) – modify so that dimension “B” is provided and dimension “B/2”. Add a 9(c). See Jan.
         comments
   10(a) – See Jan. comments
   10(b) – See Jan. comments.
   10(c) – Label second arrow as optional. See Jan. comments
10(d) – Label two of the arrows as optional
11 – okay
12 – Add asterisks to downstream arrows
13 – Replace with figure from 2003 MUTCD. Allow a dotted line of length “d” to be used as an option up to the d/4 point past the lane ends sign.
14 – okay
15 – okay
16 – okay
17 – See Jan. comment. Also add asterisks to arrows. Also either two of the arrows to the beginning of the left turn pockets – ones that only have one arrow
18 – okay
19 – okay
20 – okay
21 – Change MIN to TYPICAL for parking space dimensions
22 – okay
23 – okay
24 – See Jan. comment
25 – Added two new pavement marking guide signs
26 – okay
27 – Add asterisks to downstream arrows and add an arrow to the beginning of the SB left turn lane. Move arrow to the beginning of the left turn pocket
28 – okay
29 – okay
30 – Extend double yellow line farther past the curve
31 – okay
32 – Separation of double lines needs to be addressed
33(c) – Arrow points to wrong line
33(d) – Show a double solid wide white. Also one of the notes with arrows is missing some text
34 – okay
35 – okay
36 – okay
37 – okay

3C (Roundabouts) – See January comments.
3D-1 – okay
3G-1 – okay
3H-1 – New figure. Still need to change “Dashed Center Line” to “Broken Center Line”