ADA Training
Accessible Pedestrian Signal (APS)

2018
MnDOT
APS Design Considerations

- Design quadrant first
  - MNMUTCD Criteria
  - MnDOT Criteria
  - Right-of-Way Needs
    - Signal Pole and Cabinet Placement
- Crosswalk Orientation
- Plan Format
- Other design elements:
  - Pork Chops/Islands,
  - Rural APS Design
  - Bumpouts with APS
MNMUTCD Push Button Criteria

- **42 in. button height**
- **10 ft. minimum button separation**
- **Adjacent to landing**
- **1.5 ft. to 10 ft. from back of curb**
- **5 ft. max offset from crosswalk edge**
Typical Push Button Location

2. A minimum 4 ft x 4 ft landing area shall be provided adjacent to each button, with a 2 percent maximum slope in all directions.

3. Buttons shall be within 5 ft of the outside edge of the crosswalk.

4. Buttons shall be between 1.5 ft and 10 ft from the back of curb or edge of roadway, measured in the direction of travel. Standalone push button stations should be 4' minimum from the back of curb to avoid knockdowns.

5. Buttons shall be at least 10 ft apart.
Typical Push Button Location
Grass Blvd
When sidewalk is at the back of curb the push button should be placed toward the back of walk. This improves the MAR and allows the push button to not be in the middle of the walk.
Typical Push Button Location
Maintenance Access Route (MAR)

• A MAR is the minimum clear distance between raised obstacles (i.e. push button stations, signal, lighting or utility poles, buildings, retaining walls, V curbs, hydrants, sign posts, etc.) needed for the mechanical removal of snow and ice.

• The MAR width is dependent on the anticipated snow and ice equipment utilized – 6’ for sidewalks and 8’-10’ for shared use paths.

• The MAR is only required on the same route as a PAR, does not need to meet 2% cross slope requirements, and should be a paved surface at signalized quadrants.
**MAR & PB Centered on Landing**

6 PROVIDE A MAINTENANCE ACCESS ROUTE (MAR) WHEREVER POSSIBLE FOR SNOW REMOVAL PURPOSES. A MAR REQUIRES A 6 FT MINIMUM CLEAR DISTANCE BETWEEN A PUSH BUTTON AND ANY OBSTRUCTIONS, INCLUDING BUILDINGS, V-CURB, ELECTRICAL FOUNDATIONS, SIGNAL CABINETS, OR ANOTHER PUSH BUTTON.

7 BUTTON SHOULD BE 2 FT MINIMUM FROM RAMP GRADE BREAK AND BACK OF WALK.
MAR Takes Priority

• Push Button Offset from Grade Break
  – Min. 0.75’
  – Preferred min. 2.0’

• Maintain a 6.0’ Maintenance Access Route
Push Button in Middle of Walk
0.75’ min. is the distance a push button can be from a grade break

2’ min preferred
Signal Control Points
Push Button Table

Landing

4’ long ramp designed

6’ long ramp constructed
ROW needs at Signalized Intersections (grass blvds)
ROW needs at Signalized Intersections (no blvd)
Signal Pole in Middle of Trail
Signal Pole in Middle of Ramp
Signal Pole in Middle of Landing
Signal Pole in Middle of Landing
Cabinet in Middle of Walk
Control Points

### SIGNAL CONTROL POINTS

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<th>POINT NO.</th>
<th>X</th>
<th>Y</th>
<th>DISTANCE TO FRONT OF LANDING (FT)</th>
<th>DISTANCE TO BACK OF LANDING (FT)</th>
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### CONTROL POINTS

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Example APS Intersection

**Signal APS Upgrade Example Plan**

- Only one intersection per sheet.
- Include (x,y)Is for the center of all proposed push button, pedestal and signal pole locations. The point numbers will cross reference with the Signal Plan.
- 20' or 30' scale if needed to fit.
- Distances from push button to front and back of landing included to provide the 6 ft MAR (Maintenance Access Route), or the 4 ft min. PAR, and to emphasize that 2 ft min. is achieved from all grade breaks thus providing usable landings adjacent to the push buttons.
- Push buttons quite often need to be located at the back of walk such that a maintainable clear distance of 6 ft can be achieved between raised obstacles (MAR).

For level 2 quadrants, include only one Control Point per ramp. Locate this point on the outside edge of domes. Select the Trunk Highway side for depressed corner or fan ramps.

Always explain vertical tie-ins using contractor friendly terms or the Designer's Intent.
Example APS Intersection

• Show all proposed and existing signal components:
  – hand holes, cabinets, push buttons, pedestals, signal poles
  – Must be shown on the ADA detail sheet (20-30 scale)

• Proposed hand holes should be located outside the PAR
“Floating” Crosswalk
“Floating” Crosswalk

- PB2-1 – Located on a ramp grade break, too close to the road, adequate MAR?
- PB2-2 – Located in middle of walk
"Floating" Crosswalk

- Crosswalks intersect each other in roadway
- Offset to crosswalk greater than 5 ft.
- The distance between buttons will be less than 10 ft.
Crosswalk Striping

Crosswalks shall be striped in a straight alignment between the outside edge of detectable warning, with no kinks unless shown kinked in the plan.
Detectable Edge Best Practice

• Mill pavement and/or edge of sidewalk
• Wayfinding for visually impaired users
Urban Median Islands

- 12’ min. (measured from back of curb to back of curb) is needed on the short leg to allow enough room to build pedestrian ramps and landings.
Urban Median Islands

- Porkchop Islands should have a shared landing with the alignment shown on the left.
Urban Median Islands

Option 1: Relocate ramp
Option 2: Enlarge porkchop
Rural Pad

- A rural pad is a depressed corner with no curb and gutter that flows away from the road to the ditch.
Rural Median Islands

- Typically should be kept rural (flat) so the existing drainage patterns are maintained
Typical Push Button Placement

Combined Directional Ramps with APS typically work well at large bump-outs with compound radii due to the required 10’ min. push button (PB) separation needed, and the 2’ min. PB setback from grade breaks.
APS Example Intersection
APS Example Intersection
APS Example Intersection
APS Hardware & Details

- Push Button Station
- Pole Mounting Adaptors
- Push Button Spacers (Saddle Adaptors)
- Signal Plan Detail
- Pedestal Foundation Standard Plate
Discontinued Push Button Station - Detail

Notes:
- Placement and construction of the push button station is critical. Mount the button so that the face is parallel with the associated crosswalk, with a 30° to 45° angle between the button and the crosswalk, prior to mounting the accessible push button unit at the post.
- Blind threaded inserts in the base must be inserted using manufacturer’s specific installation tool. No other method of installation is acceptable.
- Blind threaded inserts shall be zink plated steel with 1/2-20 UNC threads. Insert shall be suitable for use on a mounting surface wall thickness of 33 mm. Approved blind threaded inserts can be found on the manufacturer’s list.
- Mounting bolts shall be 1/4-20 stainless steel, apply brush on anti-seize compound to bolts prior to assembly.
- Screw a bead of Dow silicone sealant along the top of the push button unit where it comes in contact with the 30° angle.
- Reflective sheathing shall be white at intersection corners and shall be yellow when used in zipper medians. See NRD241040 qualified products list (JPL for approved sign sheet).
- Anti-seize compound must be used on the mounting bolts when the push button is mounted.
- Concrete foundation shall be cast in place and constructed flush with the surrounding sidewalk.

Typical APS Pedestrian Push Button Location

Access to Pedestrian Signal APSI Pedestrian Push Button Station

Typical APS Push Button Location Detail

State Prog. No: 0215-63 (T.R. 10)
Sheet No: 41 of 67

By:
DATE: 10/01/2011
M.N. 506
M.E. 2298

Certified by:
10/01/2011

2/24/11

Curb 3' if needed

6' MAX

Curb 3' if needed

10' MAX

2' MAX

6' Walk
Discontinued Push Button Station - Detail
Current APS Push Button Station - Detail

TYPICAL APS PEDESTRIAN PUSH BUTTON LOCATION

THIS IS A GENERAL DETAIL INTENDED TO SHOW THE REQUIREMENTS OF APS PUSH BUTTON LOCATION. FOR PROJECT SPECIFIC INFORMATION REGARDING PEDESTRIAN RAMP LAYOUT AND PUSH BUTTON LOCATIONS, SEE THE PLAN.

SUPPLEMENTAL GUIDANCE FOR CONSTRUCTING COMPLIANT APS PUSH BUTTONS:

1. THE FACE OF THE BUTTON SHALL BE PARALLEL WITH THE OUTSIDE EDGE OF CROSSWALK.
2. A MINIMUM 4 FT X 4 FT LANDSCAPING AREA SHALL BE PROVIDED ADJACENT TO EACH BUTTON, WITH A 2 PERCENT MAXIMUM SLOPE IN ALL DIRECTIONS.
3. BUTTONS SHALL BE WITHIN 5 FT OF THE OUTSIDE EDGE OF THE CROSSWALK.
4. BUTTONS SHALL BE BETWEEN 1.5 FT AND 10 FT FROM THE BACK OF CURB OR EDGE OF ROADWAY, MEASURED IN THE DIRECTION OF TRAVEL. STANDALONE PUSH BUTTON STATIONS SHOULD BE 42 IN. BACK FROM THE CURB TO AVOID KNACKOWLEDGES.
5. BUTTONS SHALL BE AT LEAST 10 FT APART.
6. PROVIDE A MAINTENANCE ACCESS ROUTE (MARP) WHEREVER POSSIBLE FOR SHOULDER REPAIR

MUTCD

MnDOT

NOTE:

- PLACEMENT AND ORIENTATION OF THE PUSH BUTTON STATION IS CRITICAL. MOUNT THE BUTTON SUCH THAT THE FACE IS PARALLEL WITH THE ASSOCIATED CROSSWALK IN A SUFFICIENT DISTANCE TO PROVIDE A CLEAR VISIBLE PATH BEFORE MOUNTING ACCESSIBLE PEDESTRIAN PUSH BUTTON UNIT TO THE SHAFT.
- ORIENT ACCESS OPENING IN THE BREAKAWAY PEDESTAL DIRECTLY BELOW THE APS BUTTON.
- INSTALL BLIND THREADED INSERTS USING MANUFACTURING SPECIFIC INSERTION TOOL.
- USE ZINC PLATED STEEL 3/16" X 4" HINGE SCREWS FOR MOUNTING TO WALL SURFACE.
- ASSURE EROSION RESISTANT NUTS, BOLTS, AND INSERTS USED ARE OF THE SAME MATERIAL AND SIZE AS THE MOUNTING STUDS AND COMPARTMENTS.
- AVOID ONLINE CONCRETE, JOINTS, OR THE EDGE OF CONCRETE WALK ARE A MINIMUM 3 IN. FROM THE CENTER OF THE PUSH BUTTON FOUNDATION.

CONTRACTOR MUST USE OPTION 1 OR 2 WHEN THE APS BUTTON IS SHOWN AT THE EDGE OF WALK. OPTION 1 OR 2 MUST BE USED THROUGHOUT THE ENTIRE PROJECT.
APS Push Button Station

**APS PUSH BUTTON STATION**

- **Silicone Bead**
- **Accessible Pedestrian Push Button Unit W/Sign**
- **Push Button**
- **Above Sidewalk Landing Area**
- **Sidewalk Landing Area**

### Notes:
- **Concrete Mix 3F52 or Equal**
- **18" Diameter**
- **12" Min.**
- **1" (VHD) Slope**
- **Compacted Aggregate Bedding**
- **Drill 4 - 3/4" Holes 6" Deep**
- **Insert Four Anchor Rods Using Two Part Epoxy Found On The MnDOT APL For Signals**
- **1" Rigid PVC Conduit**

### Specifications:
- **Anodized Aluminum Dome Cap**
- **3" Reflective Sheeting**
- **Drill 25/64" Holes (2) For Blind Threaded Insert**
- **Drill 3/4" Hole For Wires**
- **3" Reflective Sheeting**
- **4" Trade Size Diameter Aluminum Shaft** (Schedule 40 Aluminum - 48" Length) Spun Finished, Anodic Coating As Per MIL-A-8625C For Type II, Class I Coating.

### Anchor Rod Placement:
- **7" x 2" 6" Bolt Circle**
- **Anchor Rods**

### Additional Details:
- **Nominal 4" National Pipe Thread (NPT) As Required At The End Of The Pipe.**
- **APS Push Button Base (See MnDOTS Approved/Qualified Products List)**
- **1" Rigid PVC Conduit With End Bell (2" +/- 1/2" Projection)**
- **5/8" (UNC) x 7 1/2" 1/4" 1/4" Stainless Steel Rod In Accordance With MnDOT 3385.20 Rods And Chamfered (Rounded) Edge On Both Ends.**
- **1/2" Rounded Radius**
- **Ground Line**

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*Image of APS Push Button Station*

*Image of APS Push Button Station Installation Details*
APS Push Button Station
APS Push Button Station

CONTRACTOR MUST USE OPTION 1 OR 2 WHEN THE APS PUSH BUTTON IS SHOWN AT THE EDGE OF WALK. OPTION USED (OR SELECTED) MUST BE THE SAME THROUGHOUT THE ENTIRE PROJECT.

OPTION 1

CONCRETE WALK

LANDING

9" 12"

NON-WALKABLE SURFACE

OPTION 2

CONCRETE WALK

LANDING

9"

NON-WALKABLE SURFACE
APS Push Button Station

TWIN PERPENDICULARS
(SHOWN)

THIS DETAIL APPLIES TO ALL DESIGNS WHEN
PUSH BUTTONS ARE AT THE TOP OF A RAMP
The APS push button shall meet the vertical horizontal and crosswalk skew requirements.

Height and Reach
- 10” max horizontal reach
- 42” push button height
Pole Mounting Adaptor

42”
Push Button on Pedestal

When a push button is placed on a new or previously existing pedestal pole, the push button shall be installed using 3 APS Push Button Spacers (Saddle Adaptors).
Saddle Adaptors on Pedestals
MnDOT Signal Plan Details
APS PB Pole Mounting Adaptor & Spacers

EXTENDED THREADED POLE ADAPTER

NOTES:
1. ALL THREADS SURFACES TO BE COATED WITH ANTI-SEIZE COMPOUND.
2. USE SIGNAL HEAD MOUNTED SPACERS FOR 4 SECTION POLE HEADS.
3. SEE STANDARD PLATE NUMBER 923 FOR ADDITIONAL SIGNAL POLE DETAILS.
4. EXTENDED THREADED POLE ADAPTOR ONLY USED WITH 6 SECTION CLUSTER HEADS.

TYPICAL SIGNAL POLE MOUNTING
NOT TO SCALE

TYPICAL PEDESTAL MOUNTING
NOT TO SCALE
• New Pedestal Foundations shall be constructed flush to within ¼” of Landing.
Prosecution of Work (ADA)
Concrete for new foundation shall be placed either with or after the landing concrete is placed.
Signal Design – Construction Staging
Signal Design – Construction Staging

- Proposed signal poles should be placed behind existing signal poles to allow the existing poles to be active during construction. They should be placed 5’ min. away from the existing pole location.

- Signal pedestal being relocated usually need temporary signal pedestals as to not disrupt vehicular traffic.
Rectangular Rapid Flashing Beacon (RRFB)

- Push Button needs to meet all APS requirements including audible message
- FHWA has rescinded interim approval of RRFB effective 12/21/17
Questions?