Incorporating ADA and APS Work on Traffic Contracts: 
Design Guidance and Construction Standards 

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Traffic Administration, INDOT 

March 7, 2018
Presentation Overview

• Background

• Design Policy
  • Chapter 40 on Design Controls
  • Figure 56-4F on Partial 3R Work (Roadside, Culvert, and Traffic Considerations)
  • Section 502-3.04 (05) on Pedestrian Signals

• Construction Standards
  • Standard Specifications §922.04
  • Standard Drawing Series 604-SWCR and 805-PBBA
  • Recurring Special Provision 805-T-202 (APS with Speech Walk Messages)

• Operations Policy (OM 14-01 on APS Studies)

• Summary
Background

• Americans with Disabilities Act (ADA)
  • Civil rights law enacted in 1990 to provide accessibility in employment, public service, public accommodations, and telecommunications.
Background (Cont’d)

• Accessible Pedestrian Signals (APS)
  • A device that communicates information about pedestrian signal timing in non-visual format such as audible tones, speech messages, and/or vibrating surfaces.
• Public Rights-of-way Accessibility Guidelines (PROWAG)
  • **Proposed 2011** PROWAG section on APS
  • **R209.1** Where pedestrian signals are provided at pedestrian street crossings, they shall include accessible pedestrian signals and pedestrian pushbuttons complying with sections 4E.08 through 4E.13 of the MUTCD (incorporated by reference, see R104.2). Operable parts shall comply with R403.
Background (Cont’d)

• INDOT APS Policy Statement
  
  • As an agency, INDOT is committed to implementing the installation of accessible pedestrian signals to ensure that where our pedestrian facilities communicate information, we also include features that provide information in a format that is accessible to individuals who are blind, have low vision, are deaf or have impaired hearing.
Background (Cont’d)

• INDOT APS Policy Statement
  • Adopted in January 2014 with concurrence from the FHWA Indiana Division Office.
  • INDOT has not adopted PROWAG with respect to APS. But INDOT will look at each project location to determine if APS is appropriate.
  • A 2014 multistate survey indicated that most state DOT’s (~60%) take a similar approach.
• INDOT APS Policy Statement
  • Requires an APS Study for all new or reconstructed traffic signals with pedestrian signals.
  • Requires an APS Study at existing traffic signals based on a public request for APS at a location.
  • APS studies are to be documented and available for public inspection.
Design Policy

Chapter 40 on Design Controls

- ADA Compliance is a Level One Design Criteria
- Exceptions must be documented under procedures in §40-8.04(01)
- Exceptions are available for:
  - Technical Infeasibility – an existing constraint that cannot be removed or adjusted.
  - Technical Inquiry – an existing constraint makes it impractical within the scope of work to comply.
# Design Policy (IDM Figure 56-4F)

<table>
<thead>
<tr>
<th>Pavement Treatment →</th>
<th>Prevent. Maint.</th>
<th>Functional</th>
<th>Structural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culvert, Extend</td>
<td>E</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Modify</td>
<td>E</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Place New</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Repair and Clean</td>
<td>E</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Replace</td>
<td>E</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Headwalls, Remove</td>
<td>C</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Seeded Area, Grade and Seed or Sod</td>
<td>E</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Guardrail End Treatment, Repair Damaged</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Replace product not on apprv. list with apprv. prod.</td>
<td>E</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Replace type 1 with type 3S or OS as required.</td>
<td>E</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Highway Sign, Replace</td>
<td>C</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Impact Attenuator, Repair Damaged</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Replace product not on apprv. list with apprv. prod.</td>
<td>E</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Linear Grading</td>
<td>C</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Mailbox, Adjust Mounting Height Where Required</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Replace Where Required</td>
<td>E</td>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>Obstruction-Free-Zone Clearance, Remove Fixed Object &gt; 4 in, Above Ground</td>
<td>C</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Pavement Markings and Delineation, Pavement Markings, Place</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Raised Pavement Markers, Place or Replace</td>
<td>C</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Raised Pavement Markers, Replace</td>
<td>E</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Side Ditch, Reshape or Riprap</td>
<td>E</td>
<td>B</td>
<td>B</td>
</tr>
</tbody>
</table>

Key to work incidental to paving is shown at the end of the table.

## PARTIAL 3R WORK
**Roadside, Culvert, and Traffic Considerations**

Figure 56-4F
(Page 1 of 2)

<table>
<thead>
<tr>
<th>Pavement Treatment →</th>
<th>Prevent. Maint.</th>
<th>Functional</th>
<th>Structural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side Slope, Flatten to Traversable Level</td>
<td>C</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Sidewalk, Repair or Replace per ADA requirements</td>
<td>B</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Sidewalk Curb Ramp at Intersection, Upgrade existing to ADA requirements</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Place in exist. sidewalk per ADA requirements</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Traffic Barrier, Bridge Railing, Upgrade to Current Standards</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Guardrail, Repair or Replace Damaged</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Guardrail, Replace Obstacle 1 or Weathered</td>
<td>C</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Guardrail, Place or Lengthen to Current Standards 2</td>
<td>C</td>
<td>B</td>
<td>B</td>
</tr>
<tr>
<td>Guardrail to Bridge Railing, Connect</td>
<td>C</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Guardrail Transition, Upgrade to Current Standards</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Traffic Signal, Add or Upgrade</td>
<td>C</td>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>Detector Loop or Handhole, Perpetrate</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
</tbody>
</table>

Key to work incidental to paving:

A = Item should be included as part of the project.
B = Item may be included.
C = Item should not be included. If it is considered, it should be programmed separately as a spot improvement.

Notes:
1. Obstructed guardrail should be treated as shown in Section 49-4.02.
2. Treat as described in Section 55-3.04.
3. For example, tree, bush, post, rock, private sign, etc. See Section 55-3.02 for obstruction-free zone information.
Design Policy (Cont’d)

For Resurfacing Contracts, Design Manual Figure 56-4F provides guidance on when traffic items should be addressed. The guidance varies based on whether the resurfacing is:

• Preventative Maintenance

• Functional – correcting pavement deficiencies such as roughness or poor friction. Corrects distresses caused by traffic or environmental conditions.

• Structural – existing pavement structure has failed due to load related stresses.
Design Policy (Cont’d)

Section 502-3.04 (05) on Pedestrian Signals:

• Pedestrian signal indications should be provided on new or modernized traffic signal installations per IMUTCD §4E.03. (a pedestrian or school crossing signal warrant is met or elsewhere based on engineering judgment).

• The use of APS at a location will be based on an APS study conducted by the designer or the district traffic engineer.

• If APS are needed and the pedestrian push buttons for the two crossing directions are less than 10 ft apart a speech walk message is required.
Design Policy (Cont’d)

- Traffic Contracts and Curb Ramp Review

<table>
<thead>
<tr>
<th>Pedestrian Pushbutton or Pedestrian Signal Head Work</th>
<th>Curb Ramp Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian pushbuttons are newly placed, modified, updated, or relocated</td>
<td>Curb ramp review and/or reconstruction must be included in the traffic contract</td>
</tr>
<tr>
<td>Pedestrian signal heads are newly placed, modified, updated, or relocated</td>
<td>Curb ramp review and/or reconstruction must be included in the traffic contract</td>
</tr>
<tr>
<td>No pedestrian pushbutton or signal head work but there is existing sidewalk present in one or more quadrants</td>
<td>Curb ramp review and/or reconstruction may be included in the traffic contract</td>
</tr>
<tr>
<td>No pedestrian pushbutton or signal head work and no existing sidewalk</td>
<td>Curb ramp review and/or reconstruction does not need to be included in the traffic contract.</td>
</tr>
</tbody>
</table>
Design Policy (Cont’d)

- APS Studies for Various Project Types

<table>
<thead>
<tr>
<th>Project Types That Require APS Studies</th>
<th>Project Types Where APS Study is Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>(New or Reconstruction Projects)</td>
<td>(Maintenance Projects)</td>
</tr>
<tr>
<td>New Signal Installation</td>
<td>Traffic Signals Maintenance</td>
</tr>
<tr>
<td>Traffic Signals Modernization</td>
<td>Traffic Signals Repair</td>
</tr>
<tr>
<td>Signs, Lighting, Signals &amp; Markings</td>
<td>Signal Visibility Improvements*</td>
</tr>
</tbody>
</table>

*Optional unless upgrading the pedestrian signal heads
Construction Standards

• 2018 Standard Specifications §922.04
  • Defines APS and Non-APS Type Push Buttons
  • Standardizes Push Button Sign (R10-3e)
Construction Standards (Cont’d)

• 2018 Standard Specifications §922.04

• Basic Pedestrian Push Buttons
Pedestrian push buttons shall be ADA compliant with a red latching LED and audible tone to provide confirmation of an actuation call.

  • Housing: aluminum alloy, powder coated yellow.
  • Latching LED: when push button is activated the LED shall illuminate and remain on until the beginning of the walk phase.
  • Actuator: stainless steel with a minimum diameter of 2 inches, no moving plunger, nominal operating force of 5 lb.
Construction Standards (Cont’d)

• 2018 Standard Specifications §922.04
  • APS Type Push Buttons
    • Audible Features: automatic volume adjustment required up to a maximum of 89 dB.
    • Percussive tone used if the pushbuttons are at least 10 ft apart and a speech walk message is used if the pushbuttons are less than 10 ft apart.
    • Tactile Features: the arrow must be raised at least $\frac{1}{32}$” and must vibrate during the walk interval.
Construction Standards (Cont’d)

• Standard Drawing E 604-SWCR-01

GENERAL NOTES:
1. All slopes are decimals rather than relative to the sidewalk or roadway grade. Slopes of at least 0.50% less than the maximum are preferred.
2. Ramp or Transition: A ramp or blended transition shall be used at corners or sides of the sidewalk or across the street or highway.
3. Turning Space: A turning space shall be provided at the top of a pedestrian or ramp, barrier of a pedestrian ramp or curve, or wherever the pedestrian travel requires a change in direction. A common turning space may be shared by adjacent ramps. The turning space shall have a minimum clear dimension of 6 ft x 6 ft, where the turning space is considered at the center of the sidewalk or curb. Street by walkway, or return over turn. A turning space shall be at least equal to the width of the turning space in the direction of the turning walkway.
4. Hand Rails: A hand rail shall be used adjacent to a walkable surface. A hand rail may be used adjacent to a non-walkable surface. A hand rail shall have a maximum slope of 1:10. A horizontal rail may be used adjacent to a walkable surface.
5. Return Curb: A return curb is a place perpendicular to the roadway curb. A return curb may be used adjacent to a walkable or return surface.
6. Clear Space: A clear space shall be provided beyond the bottom grade breaks of a curb ramp which contains within the crosswalk and wholly outside the pedestrian walkway travel path. The clear space shall have a minimum clear distance of 6 ft x 6 ft.
7. Detectable Warning Surface: Detectable warning surfaces shall be placed at each street, highway, or sidewalk crossing. A detectable warning surface shall be located at a minimum of 2 ft in the direction of pedestrian travel and to the inside edge of a ramp, blended transition, or turning space.
8. Turning Slant: The turning slope of a ramp, blended transition, or turning space shall be measured parallel to the direction of pedestrian travel.
9. A turning slope of 0.30% or less is considered perpendicular.
10. A turning slope greater than 0.30% shall not result in a ramp length exceed 1:16.5.
11. A blended transition shall have a maximum turning slope of 0.30%.
12. A ramp space shall have a maximum turning slope of 1:16.5.
13. A ramp space shall be a maximum turning space of 0.30%.
14. Depth: Unless otherwise noted, minimum depth of a ramp, blended transition, or turning space, excluding hand rails or return cuts, shall be 13 ft.
15. Grade Breaks: A grade break at the top and bottom of a ramp, blended transition, or turning space shall be placed parallel to the pedestrian sidewalk. Grade breaks shall not be within the ramp, blended transition, turning space, or detectable warning space. Grade breaks shall be flush. Vertical discontinuities shall not be greater than 1/2", where a discontinuity is greater than 1/4", the surface shall be blended with a slope not steeper than 1:10.5.
16. Cross Slope Discontinuities: The cross slope of a ramp, blended transition, or turning space shall be measured perpendicular to the direction of pedestrian travel.
17. The maximum cross slope of a pedestrian street crossing without yield or stop control shall be 2.00%.
18. The maximum cross slope of a pedestrian street crossing with yield or stop control shall be 1.50%.
19. The maximum cross slope of a side walk crossing shall be the steepest grade of the adjacent roadway.
20. Objections such as a utility, wall, walkway, and grading shall be placed relative to the curb ramp.
21. Curb ramps shall be placed within the marked crosswalk area.
22. Drainage joints should be placed slightly below a curb ramp to prevent pooling in the path of pedestrian travel.
Construction Standards (Cont’d)

• Standard Drawing E 604-SWCR-02

Perpendicular Curb Ramp
Construction Standards (Cont’d)

• Standard Drawing E 604-SWCR-05

One-Way Directional Perpendicular Curb Ramp
Construction Standards (Cont’d)

- Standard Drawing E 604-SWCR-08

Parallel Curb Ramp
Construction Standards (Cont’d)

- Standard Drawing E 604-SWCR-09

Blended Transition Curb Ramp
Construction Standards (Cont’d)

Other Curb Ramp Designs

Diagonal Curb Ramp
(not allowed for new construction)

Depressed Corner Curb Ramp
Construction Standards (Cont’d)

• Standard Drawing E 805-PBBA-01

NOTES:
1. The face of a pedestrian pushbutton assembly shall be aligned parallel to the direction of pedestrian travel on the associated crosswalk.
   - The actuator shall be a 2 in. minimum diameter and the color shall contrast with the housing or mounting. The actuator for an accessible pedestrian signal shall differ from the walk signal.

2. For an accessible pedestrian signal, a tactile arrow shall be provided. The tactile arrow shall be part of the actuator or can be directly above or below the actuator. The tactile arrow color shall contrast with the background.

3. Pedestrian pushbutton signs applicable to pedestrian actuation shall be mounted immediately above or incorporated into the pedestrian pushbutton assembly. For an extended actuator push button, the R10-3P sign shall be mounted adjacent to or integrated with the pedestrian pushbutton assembly.

4. Where a pushbutton is located at a 5 ft. or 12 ft. pushbutton assembly extension may be used to meet the side reach requirements.


INDIANA DEPARTMENT OF TRANSPORTATION
PEDESTRIAN PUSHBUTTON ASSEMBLY DETAILS
SEPTEMBER 2017
STANDARD DRAWING NO. E 805-PBBA-01

[Signatures and dates]
Construction Standards (Cont’d)

• Standard Drawing E 805-PBBA-02
Construction Standards (Cont’d)

• Standard Drawing E 805-PBBA-03

**NOTES:**

1. Where two pedestrian pushbutton assemblies are provided on the same corner or median, the pedestrian pushbutton assemblies shall be separated by at least 10 ft. Where conditions prevent a 10 ft separation, pedestrian pushbutton assemblies may be placed closer together or on the same pole. Where accessible pedestrian signal pushbutton assemblies are less than 10 ft, the assemblies shall be in compliance with the 10 ft separation.

2. A pedestrian pushbutton assembly should be adjacent a pushbutton clear space. A pushbutton clear space shall have a minimum clear dimension of 4 ft x 4 ft.

3. The pedestrian pushbutton assembly should not be placed more than 6 ft outside the curb.

4. A pedestrian pushbutton assembly should not be placed adjacent a ramp with a running slope greater than 2%.

5. The distance from the nearest face of a pedestrian pushbutton assembly to face of the curb or edge of pavement should be between 1.5 ft and 5 ft and should not be greater than 10 ft.

6. The distance from the nearest face of a pedestrian pushbutton assembly to a grade break should be less than 1.5 ft.

7. See Standard Drawing E 805-PBBA-03 for Pedestrian Pushbutton Assembly Details.

**INDIANA DEPARTMENT OF TRANSPORTATION**

**TYPICAL PEDESTRIAN PUSHBUTTON ASSEMBLY LOCATIONS**

**SEPTEMBER 2017**

**STANDARD DRAWING NO.** E 805-PBBA-03

<table>
<thead>
<tr>
<th>No.</th>
<th>Standard Drawing No.</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>E 805-PBBA-03</td>
<td>10/26/16</td>
</tr>
</tbody>
</table>

**Design Standard Engineer**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>David F. Young</td>
<td>10/26/16</td>
</tr>
</tbody>
</table>

**User Information**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark A. Moeller</td>
<td>11/01/16</td>
</tr>
</tbody>
</table>
### §05-T-202 ACCESSIBLE PEDESTRIAN SIGNALS WITH SPEECH WALK MESSAGES

*(Adopted 11-22-13)*

Accessible pedestrian push-buttons shall be provided at:

**Name of intersection**

The walk messages used shall be as follows:

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Push-button*</th>
<th>Walk Message**</th>
</tr>
</thead>
<tbody>
<tr>
<td>North leg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South leg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East leg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>West leg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Enter "N/A", or "APS"
** Leave blank, enter "percussive tone" if applicable, or text for speech walk message

(Leave remainder of this form blank if not applicable)

### Remaining (Leave blank if not applicable)

- **Leg of intersection**
  - North leg: [ ]
  - South leg: [ ]
  - East leg: [ ]
  - West leg: [ ]

- **Walk Message:** [ ]
  - North leg: [ ]
  - South leg: [ ]
  - East leg: [ ]
  - West leg: [ ]

- **Special Instructions:** [ ]
• Pedestrian Push Button Cost Information*
  • 2012 Unit Price Averages
    • 805-78370 Pedestrian Push Button = $171 each (avg.)
      Total quantity = 522 units
  • 2015 to 2017 Unit Price Averages
    • APS Unit Price
      805-11817 Pedestrian Push Button, APS = $808 each (avg.)
      Total quantity ~ 328 units installed per year
    • Non-APS Unit Price
      805-78370 Pedestrian Push Button, Non-APS = $310 each (avg.)
      Total quantity ~ 318 units installed per year

*Note: Cost includes contractor labor and equipment charges in addition to materials
Operations Policy (OM 14-01)

• APS Studies
  • INDOT Operations Memo 14-01 contains the procedures for conducting APS studies.
  • Designers are to conduct the APS Study for signal projects (new alignment or signal modernizations). The designer should conduct the APS Study concurrently with or prior to the preliminary field check.
  • District traffic engineer will conduct the APS Study for external requests from the public and for existing intersections that are to be signalized.
  • A three tiered approach is used for APS studies.
Operations Policy (OM 14-01)

• APS Studies (Cont’d)
  • Three Tiered Approach
    • First Tier factors automatically disqualify location from APS (e.g. no sidewalks, technical infeasibility, etc.).
    • Second Tier factors automatically qualify location for APS (e.g. certain traffic generators, city/town policy, etc.).
    • Third Tier factors are for a full study and include: vehicle traffic, signal phasing, and intersection geometry
Operations Policy (OM 14-01)

• APS Studies (Cont’d)

• Operations Memo 14-01 was revised on March 1, 2018. It contains a revised study report form and a new flow chart.

A. First Tier Criteria
1. Is the intersection a location without sidewalks or that will not have sidewalks if APS are installed? or
2. Is the ambient noise level above 100 dB? or
3. Is a larger signal controller cabinet necessary for APS but infeasible due to right-of-way constraints?

Study complete, no APS

B. Second Tier Criteria
1. Are there relevant traffic generators within 2 blocks of the intersection? or
2. Is there special pedestrian phasing (e.g. exclusive pedestrian phase or leading pedestrian interval)? or
3. Is there demand for APS at the intersection from the visually impaired? or
4. Is the intersection in a community that installs APS at all pedestrian signals by local policy?

Study complete, APS recommended

C. Third Tier Criteria
1. Any previous requests for APS? or
2a. Is the daytime hourly motor vehicle volume on the minor street < 120 vph for any hour during the day? or
2b. Is the motor vehicle right-turn on red volume > 90 vph for any hour for any approach? or
3. Is there split phasing or protected left-turn phasing? or
4a. Is a crosswalk length > 40 ft? or
4b. Is there a skewed crossing? or
4c. Is a curb ramp radius > 25 ft? or
4d. Is a curb ramp not aligned with crosswalk direction? or
4e. Is there a median with a width > 4 ft? or
4f. Is there a crosswalk slope greater than 5%?
4g. Is a speed on any approach > 40 mph? or
5. Are bike lanes, a shared use path, or other similar features present? or
6. Is there APS at adjacent intersections? or
7. Are there any additional traffic generators (commercial, government, or similar land uses) within 2 blocks of the intersection? or
8. Are there any other relevant factors (pedestrian crashes, channelized right-turn lane with island, etc)?

APS is likely recommended if any of the third tier criteria are met unless the weight of the data supports a decision not to install (must document the facts supporting the decision not to install).

Yes

APS not recommended, unless otherwise desired

No

No
Summary

• Takeaways
  • Existing curb ramps that are not ADA compliant must be upgraded if the pedestrian signal heads or pedestrian pushbuttons will be upgraded on a project.
  • However, an ADA design exception is available under the technical inquiry category if an existing constraint makes full compliance impractical within the scope of work.
  • Designers are to conduct the APS study for signal modernization projects.
Questions?

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