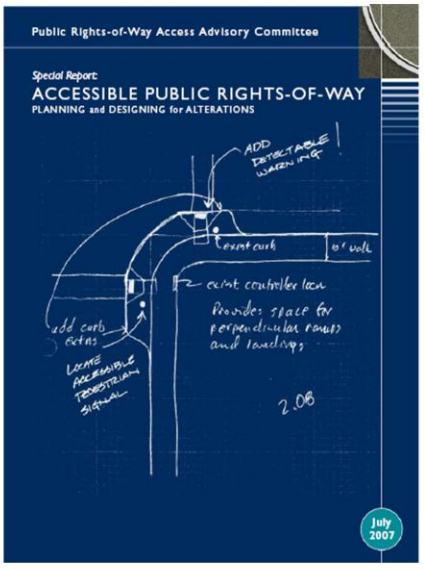

The following slides contain information and graphics directly taken from the US Access Board's document entitled: Special Report: Accessible Public Rights-of-Way.

This document can be downloaded at:
http://www.access-board.gov/prowac/alterations/guide.htm

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Case Study – Crowded Corners

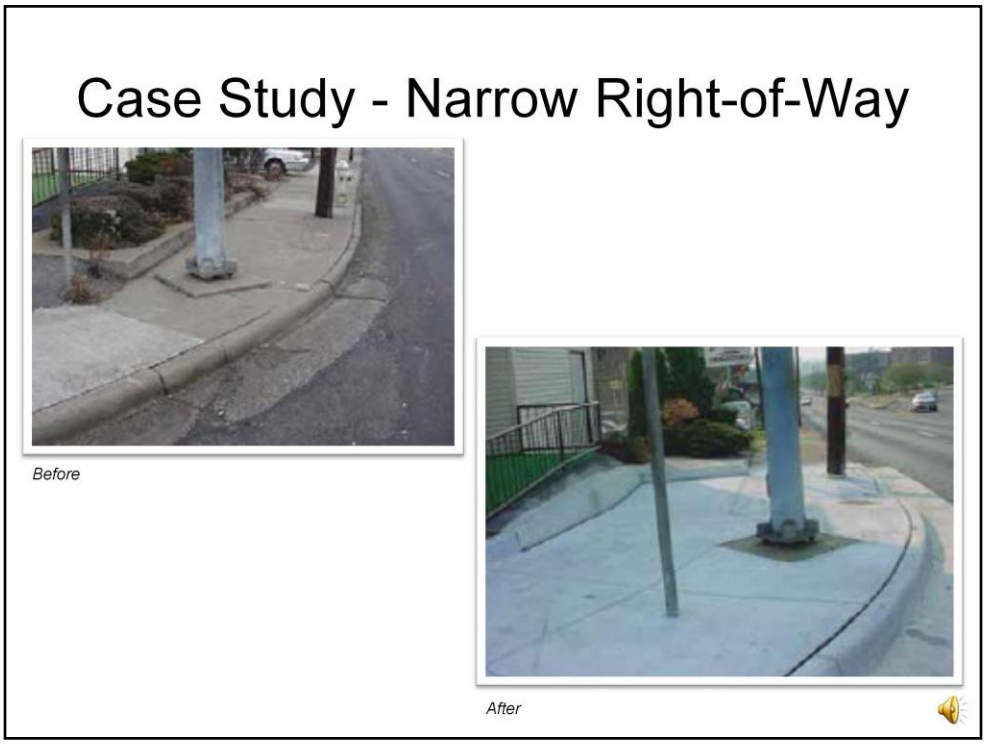
This urban corner is crowded with existing signal poles, signal boxes, and utility boxes that limit curb ramp design and placement. One solution, shown in the first photo is to reduce curb radius to maximize available corner area and ease flares to fit the available space. It is important to note that a detectable warning surface is still needed.

Case Study – Crowded Corners

Another option, shown in lower photo is to shield ramp sides against pedestrian travel with pedestrian signal poles and sidewalk furnishings. By eliminating the flares, more corner area is gained. A benefit of using curb returns is that they offer useful way-finding cues for non-visual travel. Note that the curb ramp here is the full width of the crosswalk, another pedestrian benefit.

Case Study - Narrow Right-of-Way

When this roadway was widened, only a 6-foot sidewalk remained. In this situation, a parallel, Type 2 curb ramp provides the most accessible design. The pedestrian signal is properly located at the back of the sidewalk, although APS have not been installed here. Also, this access route is used by children walking to school. A protective barrier was installed because of this and that the highway is a high-speed arterial.



In this case study involving narrow right-of-way, two curb ramps were installed in the very narrow sidewalks at this intersection by acquiring unused right-of-way from the adjacent property owner. A level landing for the curb ramps and a bypass route for pedestrians continuing around the corner was created without significant cost; the city engineer reported the ROW purchase at less than $1,000. Additionally, detectable warning surfaces must be installed to fully comply with the latest standards.

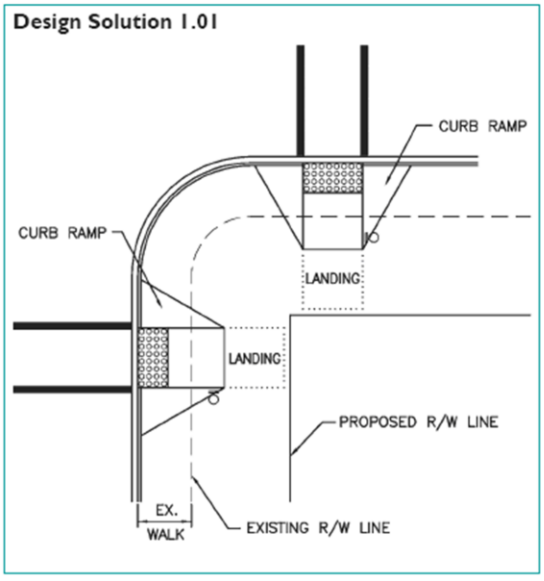
Case Study – Steps

Sometimes difficult topography requires extraordinary solutions. In this photograph of an older residential neighborhood, the existing roadways are much lower than the sidewalks and separated by wide sloping lawns. New stairs and ramps—both with handrails—make the connection to the street crossing for pedestrians. Where technically feasible, the ramps should not exceed a 8.33% maximum slope.

Case Study – Large Radius Corners

In suburban locations, like the one pictured, that have large corner radii, try installing blended transitions (running slopes that are less than 5.00%). Using brick unit detectable warning surfaces take a curve nicely and are easy to install. Also available are cast iron and masonry pavers that have radial domes. No matter which detectable warning surface is used, be sure that they meet the latest standards.

Design Solution 1.01

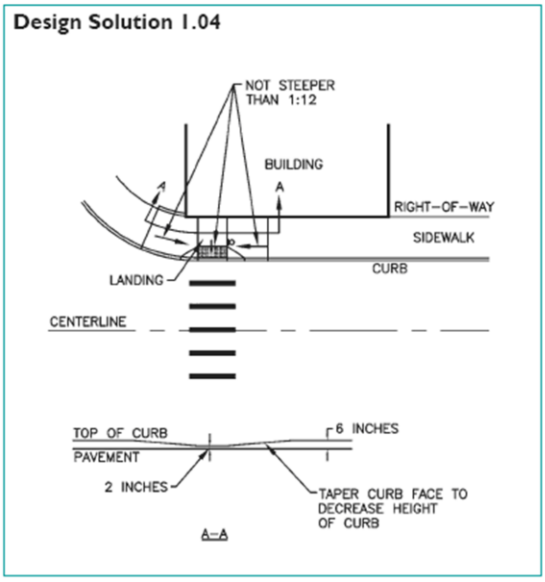


Related Design Standards
- MUTCD
- Local Codes and Standards

Related Design Guidelines
- AASHTO
- PROWAG

In many cases, there is insufficient space for the installation of an accessible curb ramp and landing at a typical street intersection that will meet new construction standards. Increasing right-of-way width can provide sufficient space to create curb ramp and landing dimensions that provide ideal construction solutions.

Design Solution 1.04



Related Design Standards

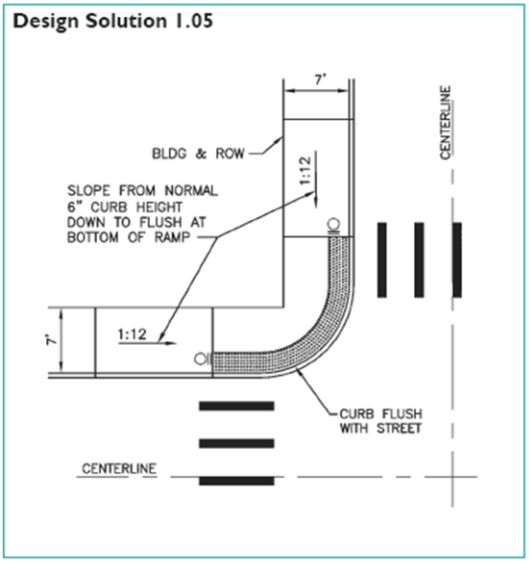
- MUTCD
- Local Codes and Standards

Related Design Guidelines

- AASHTO
- PROWAG

As demonstrated in this graphic, the combination of lowering the sidewalk and shortening the length of the curb ramp allows for sufficient space for a landing behind the curb ramp. Notice that the ramp does not exceed 1:12, or 8.33% and that detectable warning surfaces have been installed.

Design Solution 1.05

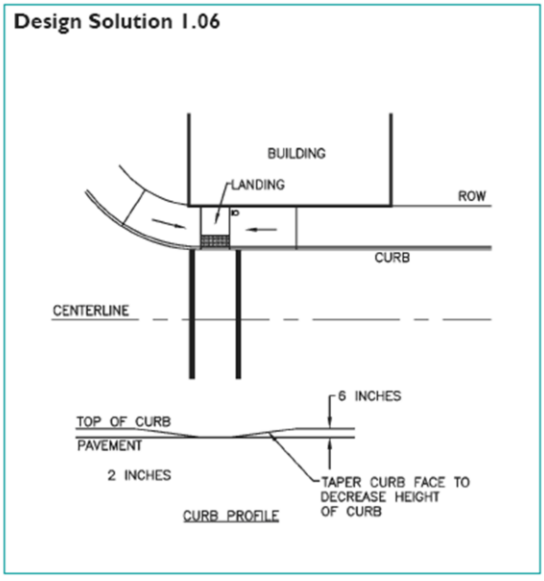


Related Design Standards
- MUTCD
- Local Codes and Standards

Related Design Guidelines
- AASHTO
- PROWAG

Another potential solution is to lower the sidewalk grade at the intersection to make the sidewalk elevation flush with the street elevation, thus eliminating the spatial needs for curb ramps. This can be done with a Blended Transition. Again, note that detectable warning surfaces are used which provide a critical message to blind travelers where the sidewalk is flush with the street and pedestrians are about to enter a vehicular route.

Design Solution 1.06



Related Design Standards

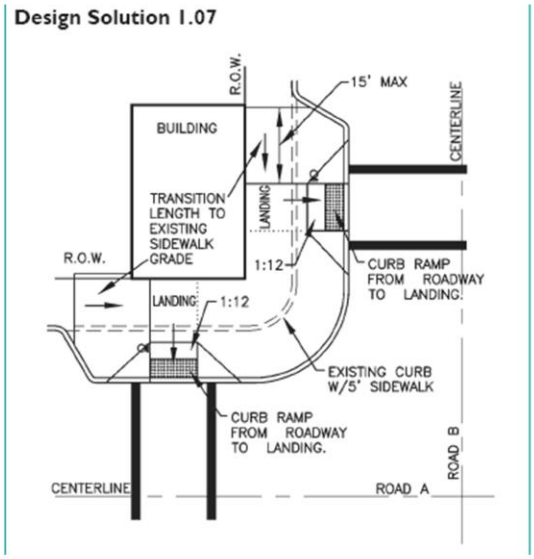
- Local Codes and Standards

Related Design Guidelines

- AASHTO
- PROWAG

This graphic illustrates the installation of a Type 2 curb ramp as a potential solution instead of using a perpendicular curb ramp. Note the installation of a detectable warning surface at the base of the ramp.

Design Solution 1.07



Related Design Standards

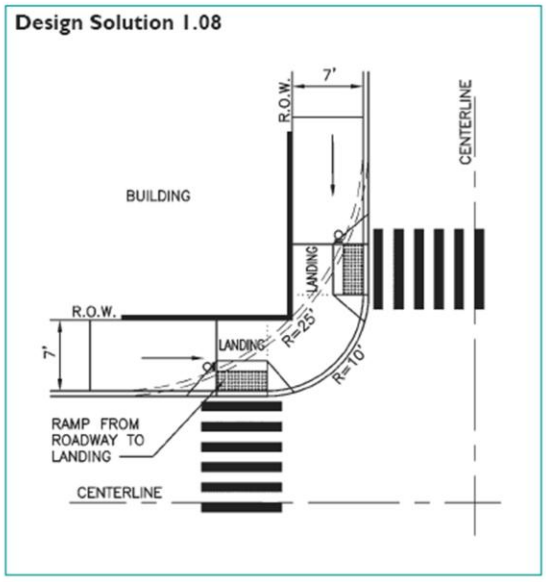
- MUTCD
- Local Codes and Standards

Related Design Guidelines

- AASHTO
- PROWAG

In this example, street width has been reduced to provide adequate space to use a Type 1 curb ramp. As shown, the reduced street width allows the use of a combination sidewalk ramp and curb ramp to achieve the required 1:12, or 8.33% slope from curb height to street grade.

Design Solution 1.08



Related Design Standards

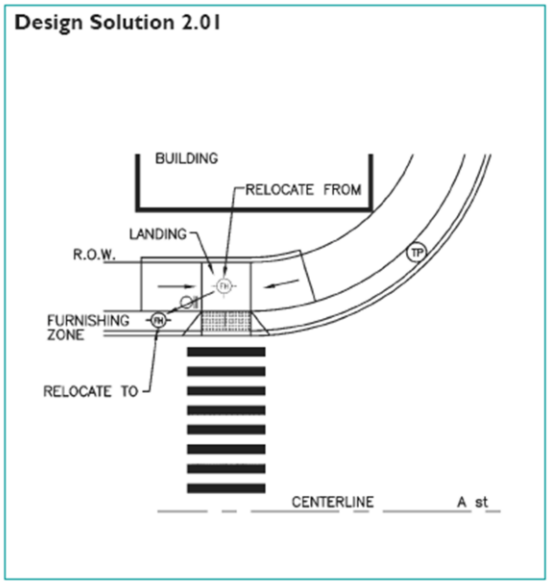
- MUTCD
- Local Municipal Specifications and Standards

Related Design Guidelines

- AASHTO
- PROWAG

In this example, the existing curb radius was over sized. This design solution uses a reduced curb radius and combination curb ramp to accommodate the shortened perpendicular portion of the curb ramp.

Design Solution 2.01



Related Design Standards

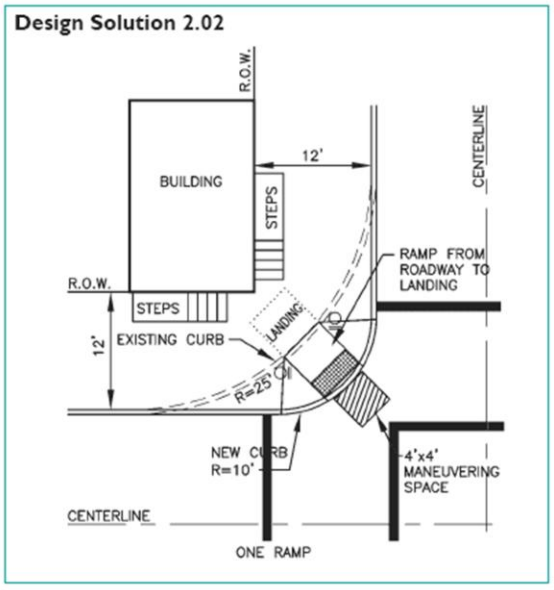
- MUTCD
- AWWA
- Local Municipal Specifications and Standards

Related Design Guidelines

- PROWAG

In this example, the fire hydrant was moved to a location that eliminated its interference with the curb ramp installation. Because there is insufficient space for a full landing and conventional curb ramp, some ramping is provided in the sidewalk and some ramping is provided in the furnishing zone or grass strip.

Design Solution 2.02



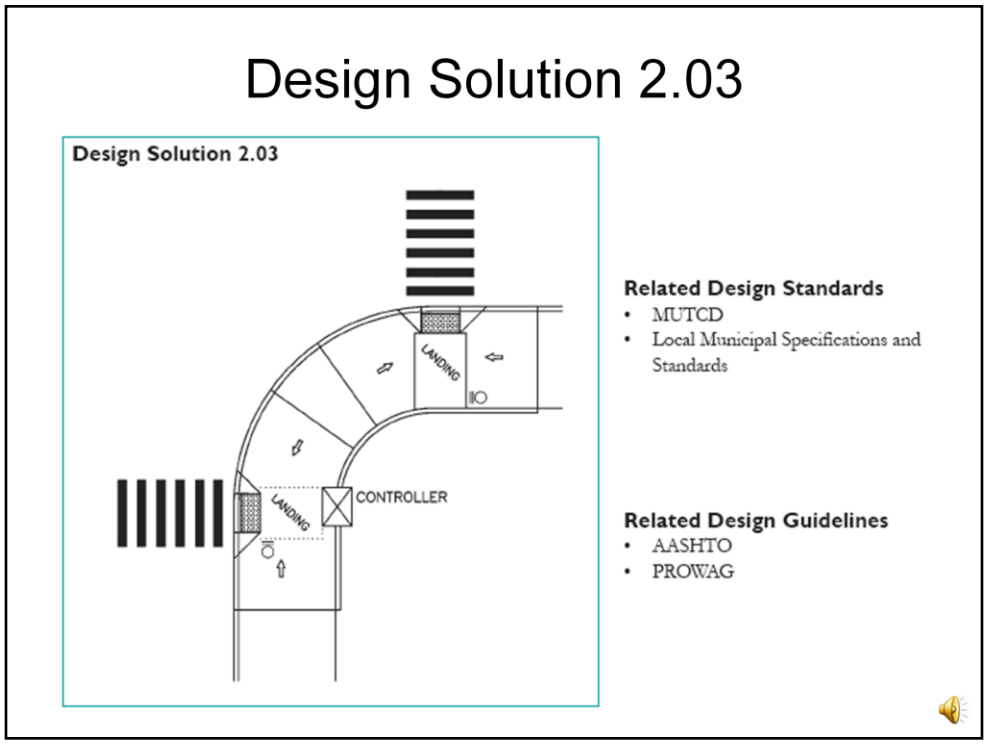
Related Design Standards

- Local Municipal Specifications and Standards

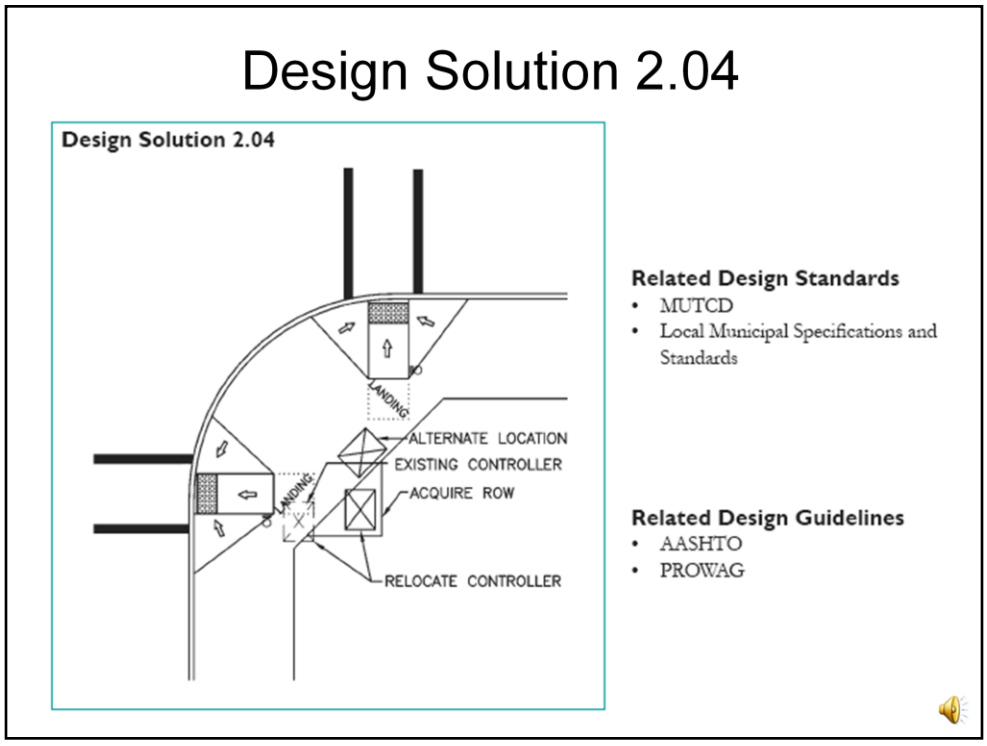
Related Design Guidelines

- AASHTO
- PROWAG

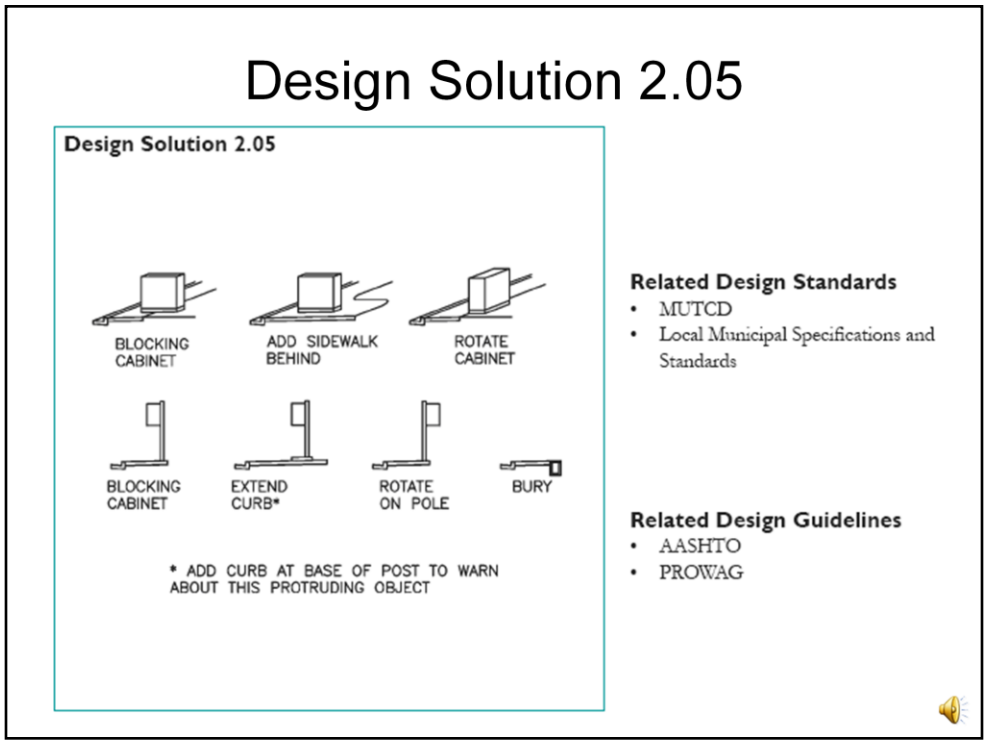
The steps located within the path of travel prevent the construction of a curb ramp for each direction of travel. However, the area at the apex of the corner is clear of existing obstructions. A single diagonal perpendicular curb ramp that serves both crossings may be the only alternative that is technically feasible. Please note that a minimum 4'x4' maneuvering space is required at the base of the ramp to allow for turning maneuvers when approaching from either direction. Keep in mind, however, that two curb ramps, if possible, are always preferable to a single diagonal curb ramp at the apex.



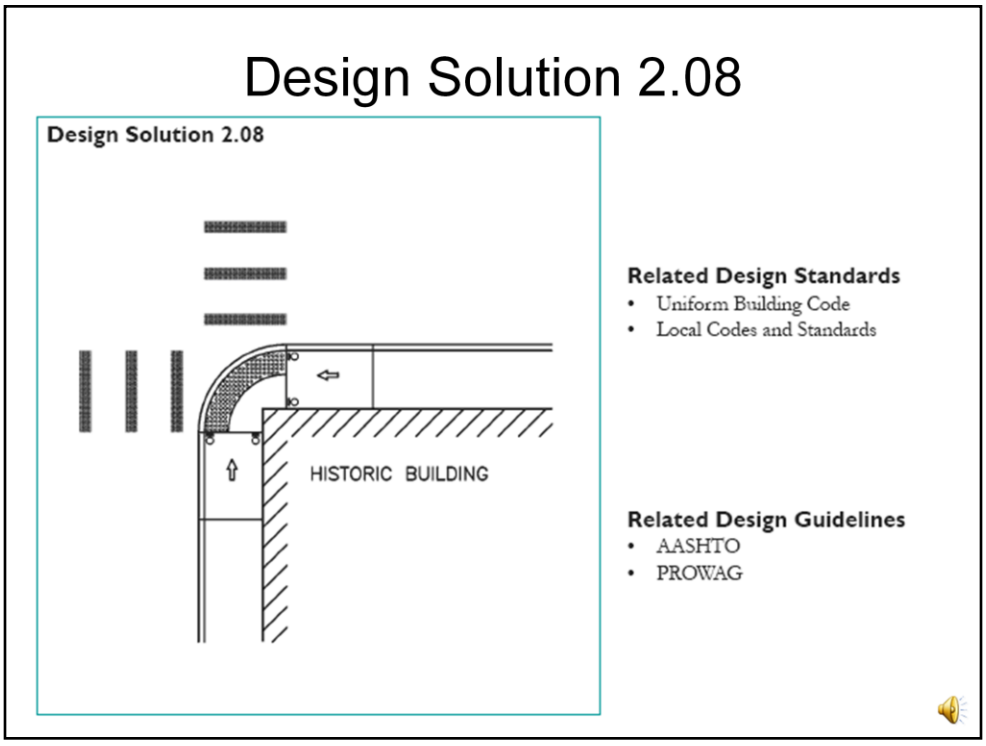
Placement of signal controller cabinets in the past failed to take into consideration the needs of pedestrians. Signal controller cabinets have been located for reasons of economy and convenience. Many of these units now block, or to a lesser degree, project into the pedestrian access route. If the base of the cabinet is sufficiently deep, it may be possible to use a combination sidewalk and curb ramp to achieve the appropriate layout. By ramping the sidewalk down three inches in the vicinity of the cabinet, it will be possible to reduce the length of curb ramp about three feet, thus providing adequate space for a landing.



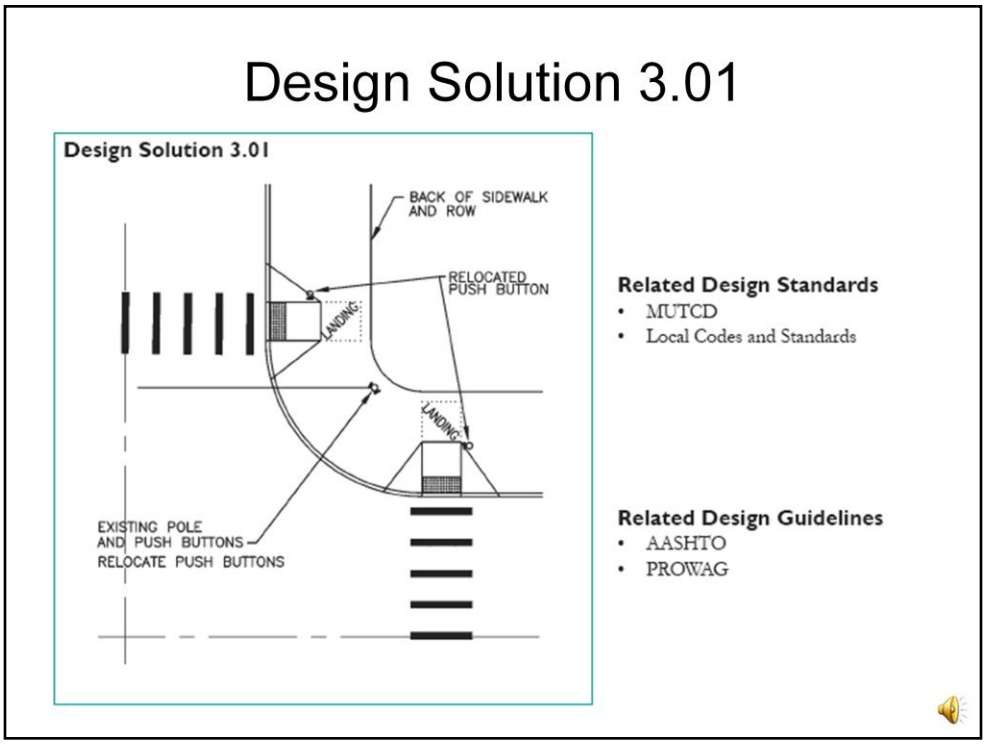
As previously discussed, signal controller cabinets have been located for reasons of economy and convenience which block or project into the pedestrian access route. The cabinet can be moved back to provide sufficient clearance for a landing at the back of the curb ramp. In this example, the sidewalk has also been extended to provide space for a level landing.



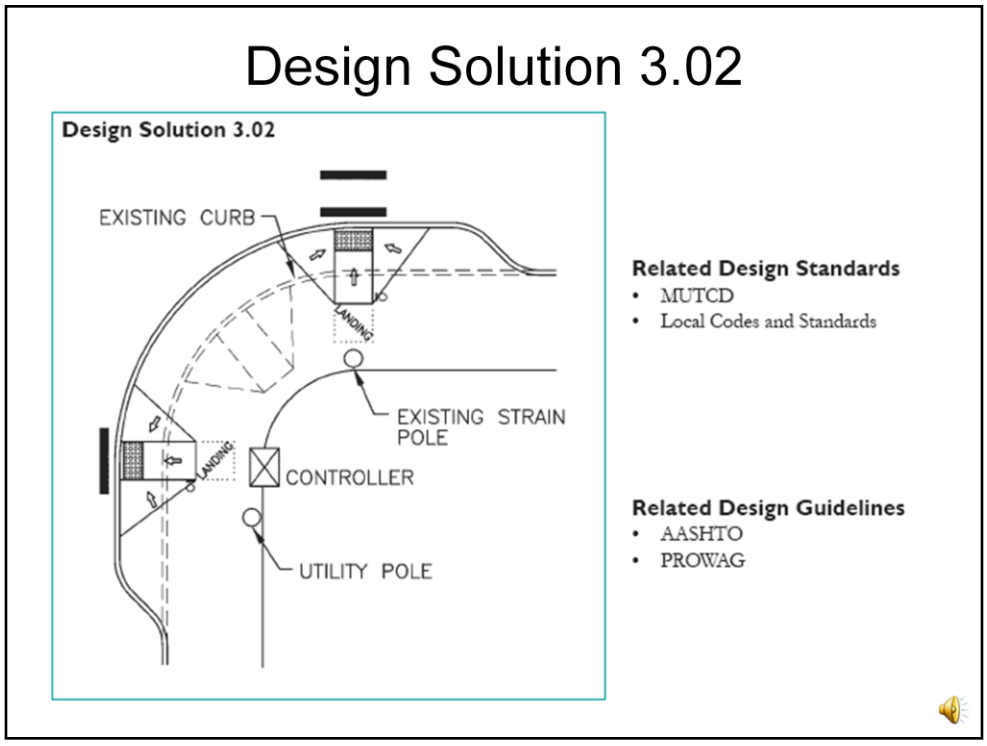
When a cabinet blocks passage along a sidewalk or at an intersection, several options exist to achieve adequate clearance. Sidewalks can be extended to wrap around the back of the cabinet, or the cabinet may be rotated to provide clearance. If the cabinet is a pole-mounted cabinet, it could be relocated to a pedestal-mounted type (built over a base, not mounted on the pole), or it could be rotated to be on the side of the pole that provides maximum passage clearance to the sidewalk.



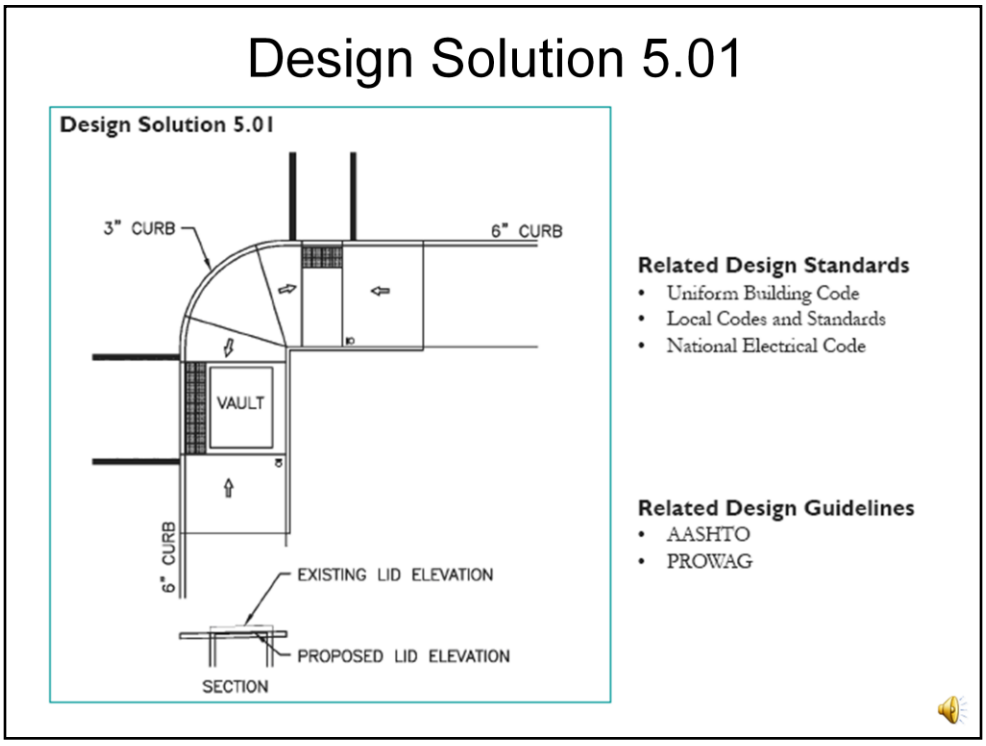
Existing historic features or significant trees limit travel space and the installation of accessible landings and curb ramps at corners. In this example, a historic building is located close to the curb face at the intersection. The solution illustrated provides a transition ramp from each approach direction and provides a blended transition at the corner.



Pedestrian actuated push buttons are often located on a central signal pole away from the curb ramps and do not facilitate efficient use by all pedestrians, including those with disabilities. Often, the travel distance from the button location to the street is excessive. Also, crossing orientation is difficult for a blind pedestrian since the locator tone and both buttons are at the same location. Installation of stub poles with APS equipment and push buttons closer to the crossing solve these problems.

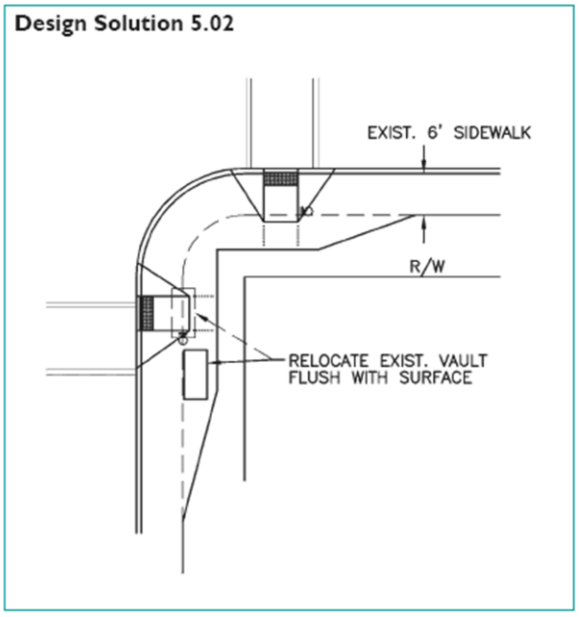


As mentioned pedestrian actuated push buttons are often located on a central signal pole away from the curb ramps and do not facilitate efficient use by all pedestrians, including those with disabilities. Corners are no exception as they often become the location for multiple poles that block the installation of curb ramps. One solution is to add curb extensions at the intersection to provide sufficient space for the installation of separate, perpendicular curb ramps and stub poles for APS and push buttons.



Existing underground obstructions limit the installation of accessible features at intersection corners. These obstructions frequently include drainage structures, basement below sidewalks, utility vaults, and other similar structures. Often, the upper portions of these structures can be modified to accept the installation of landings and curb ramps. In this example, the intersection corner has been modified to use parallel curb ramps and the interfering vault has been modified by trimming the top walls and resetting the lid at the appropriate grade. To be fully compliant, the top of the vault must be firm, stable, and slip-resistant.

Design Solution 5.02



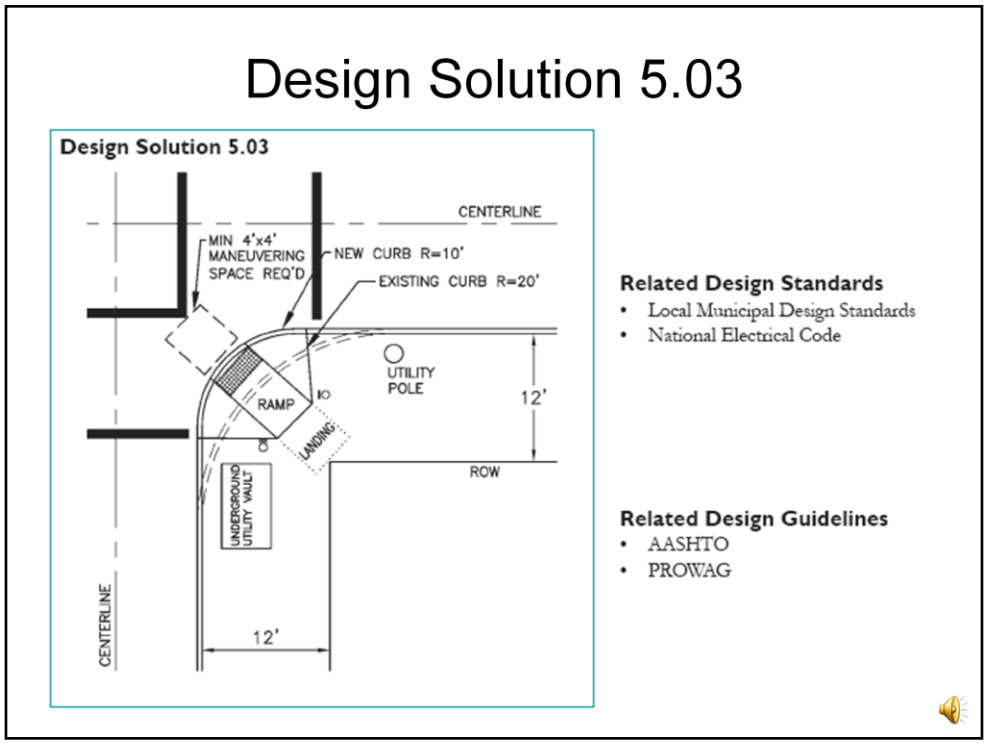
Related Design Standards

- National Electrical Code
- Local Municipal Specifications and Standards

Related Design Guidelines

- PROWAG

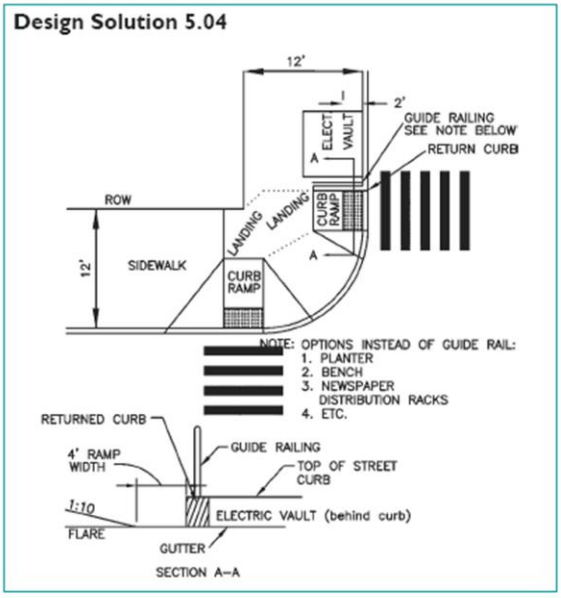
In this design solution regarding existing underground obstructions, the vault was relocated outside of the curb ramp construction area. This allowed the construction of flares, curb ramp, and level landing areas that meet the latest standards and providing complete access for pedestrians.



In this example, the large radius of the intersection combined with the location of a large underground vault has limited the ability to provide an acceptable curb ramp and landing in the south portion of the corner. The solution is to reduce the curb return radius from 20 feet to 10 feet, thus creating space to install a single perpendicular curb ramp and landing. The use of single perpendicular curb ramps should only be used if no other solution is technically feasible.

Before using this type of design solution, designers should verify that the reduced radius can accommodate typical intersection traffic. This solution could also potentially increase construction costs.

Design Solution 5.04



Related Design Standards

- Local Municipal Specifications and Standards

Related Design Guidelines

- AASHTO
- PROWAG

Existing underground obstructions limit the installation of accessible features at intersection corners. Often these obstructions cannot be modified or relocated. Flared wings of curb ramps consume a large amount of space. Where the flare would otherwise require significant modification to the location or modification to the cover of an underground facility, the use of returned curbs adjacent to the obstruction may create a curb ramp that is narrow enough to fit adjacent to existing structures. Additional railing or other physical barrier may be needed to isolate this type of curb ramp and prevent trip/fall accidents at the location of the returned curb.