American Foundation for Suicide Prevention

Lethal Means Reduction: Architectural Barriers and Structures

Overview: According to the latest data from the Centers for Disease Control and Prevention (CDC), in 2023 we lost 49,316 Americans to suicide, making it the 11th leading cause of death in the United States. That same year, falling deaths (1,297) and drowning deaths (453) accounted for 3.5% of all suicide deaths (CDC, 2025).

One of the most effective methods of preventing suicide is to give suicidal individuals and those who care for them something they desperately need: time. This includes time for the suicidal risk to diminish, time for the intense suicidal impulse to pass, or time for someone to intervene with mental health support and resources ("Means Reduction," 2019).

Barrier installation is a proven method of increasing this crucial time for individuals at risk for suicide by jumping. Barriers can be fashioned to areas of significant height that may pose a risk for a suicide attempt, such as bridges, cell towers, and parking garages. These barriers act as a delay and deterrent to an individual at risk, providing more time to get through the intense, often brief, moment of suicide crisis ("Means Reduction," 2019).

Types of Barriers: There are several types of barriers that can be installed to delay or prevent a suicide attempt. **These include chain link, plexiglass, steel mesh, steel balusters, and netting**:

- **Chain Link** is the most widely used barrier due to its low cost, light weight, low wind shear, and ease of installation. However, it can have a significant visual impact for both drivers and pedestrians (VAT, 2017). A chain link barrier was installed on Oregon's Vista Bridge in 2013 for $236,000. Since this barrier was added there have been zero suicides on the bridge (Roth, 2016).

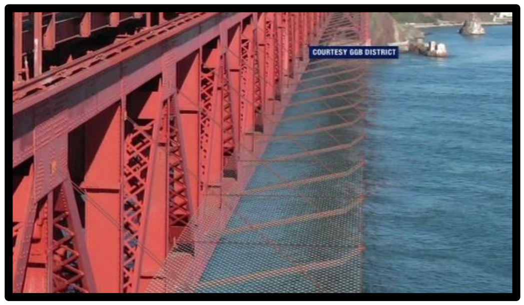
(VAT, 2017)

- **Plexiglass** is often used as a combination of a noise barrier and fence. It allows for optimal visibility to both drivers and pedestrians. However, there are disadvantages such as expensive cost, high wind shear impact, vulnerability to vandalism (painting or scratching), and high cleaning/maintenance requirements (VAT, 2017).

- **Steel Mesh** is relatively cost-effective and easy to maintain. The gaps in the mesh are small enough to deter climbing and can be almost transparent for drivers. However, it can have a negative visual impact for pedestrians (VAT, 2017).

- **Steel Balusters** are very common. They are composed of vertical balusters, typically one inch in diameter and spaced 6 to 8 inches apart. The tops are typically curved inward to make climbing more difficult. The spacing allows a clear view for pedestrians. However, they add weight and stress to the bridge and can be costlier to install than lighter weight barriers (VAT, 2017).

- **Netting** can be effective in deterring an individual as well as save someone during an attempt. Netting is mounted 15 to 20 feet below the bridge and extends out the same distance. Nets are constructed of stainless-steel wire with 8-inch openings that make the nets relatively transparent and less likely to trap debris or snow (VAT, 2017). This type of barrier was recently installed on the Golden Gate Bridge in San Francisco, California.



(Noyes, 2014)

Effectiveness of Barriers: Research shows that of all potential interventions to prevent suicides at bridges, tall buildings, and other areas that pose suicide risk due to their height, physical barriers are the most effective. In some instances, physical barriers may be supplemented with resources such as signage listing the contact information for the 988 Suicide & Crisis Lifeline and other crisis services and/or call boxes to access professional emergency services. However, it is important to note that non-barrier resources such as suicide prevention hotline call boxes on "suicide-prone bridges" have not proven as effective in saving lives compared to physical barriers, as many suicides have still occurred from bridges where they have been present (Draper, 2017). It is important to ensure that in addition to these resources, physical barriers are installed to have the greatest impact on preventing suicide.

A 2015 study out of England evaluated the effectiveness of barriers, boundary markings, lighting, closing sites, surveillance, staff trainings, signs, telephone hotlines, restricting media coverage of suicidal acts, discouraging memorials, and renaming locations in preventing suicide. The study found that barriers that physically restrict are the most effective means of preventing suicides at publicly accessible areas of height, but that they should be implemented with other interventions to be most effective (Public Health England, 2015). Similar results were found in a summary report of thirteen studies on the effectiveness of barriers at publicly accessible areas of height in Switzerland, the United States (Maine, California, and D.C.), the United Kingdom, New Zealand, and Australia. **The report found a 91% reduction in suicides at those sites** (Okalis et al., 2020).

A barrier decreases deaths by suicide in the location and can also aid in preventing suicides for the entire city where the barrier is installed. An example of this was found on Toronto's Bloor Viaduct, which was the second most frequently used bridge for suicides in North America. Since a barrier was placed on the viaduct in 2003, the site has only had one death by suicide. In addition, suicide rates have lowered across the Toronto area (McQuigge, 2017).

Although there are unique challenges to installing and funding a barrier, the benefits of saving lives should outweigh any concerns. Besides cost, one of the main reasons cited for opposition to an architectural barrier is a common misconception: that if an individual in crisis cannot access one method of suicide, such as a bridge, they will find another location or means. This misconception is known as the "method substitution effect" and does not match current evidence of suicidal behavior (Daigle, 2005). General research has found that individuals thwarted in utilizing a preferred method of suicide do not seek alternative methods. Reisch et al. (2007) found that 62% of individuals would not choose another place to jump from after being deterred by a barrier.

In a natural experiment where barriers at one site had to be removed for repair, suicides increased five-fold. Once the barriers were re-installed, no further suicides occurred, and other bridges did not experience a method substitution effect (Beautrais, 2007). Additionally, Seiden (1978) found that out of 515 individuals who were prevented from attempting suicide at the Golden Gate Bridge, only 6% of them later died by suicide. In addition, the subsequent reduction in media coverage of suicides by jumping helps remove the allure of these locations as "suicide magnets" and helps to reduce copycat suicides.

Several other factors have also been cited for prohibiting the installation of barriers along bridges, high buildings, and other publicly accessible areas of height. These can be related to a bridge's or high point's aesthetic appeal to pedestrians, the structural integrity of a bridge or building, a structure's ability to hold additional weight, and more general questions of who will cover the cost, how traffic will be affected, and who will maintain the new structure. All things considered, the cost of human life is invaluable and should be seen as a priority over these factors. For an area such as San Francisco County, where 15% of suicides are by jumps, architectural barriers can be the difference between life and death for someone in crisis (Draper, 2017).

Funding Mechanisms: Architectural barriers have historically been funded at the state and local levels. Federal funds for barriers were made available when President Obama signed the *Moving Ahead for Progress in the 21st Century Act* in 2012. This act authorized $82 billion in federal funding for Fiscal Years 2013 and 2014 for road, bridge, bicycling, and walking improvements (Federal Highway Administration Office of Policy & Governmental Affairs, 2012). In addition, the *21st Century Cures Act*, signed into law in 2016, authorizes block grants for both mental health research and highway safety improvements, which can include the instituting of suicide bridge barriers. A block grant is a large grant from the federal government to a state or community that can be used to support various broad purpose programs such as transportation and community health (RSFLG, 2021).

In 2021, the *Infrastructure Investment and Jobs Act* (H.R.3684) included a provision to establish a new allowable use of grant funding received through the Surface Transportation Block Grant Program (STBG) for the installation of safety barriers and nets on bridges. Additionally, the *Barriers to Suicide Act of 2023* was introduced in the 118th Congress, a bill which would establish a new competitive federal grant program to help state, local, and tribal governments install safety barriers and nets on bridges. This legislation would also make project funding explicitly eligible under the National Highway Performance Program.

In 2014, the Golden Gate Bridge reached 1,500 deaths by suicide since its opening in 1937. As a result, the Golden Gate Bridge District's Board unanimously approved $76 million to fund the implementation of a 20-foot-wide steel net, to be placed 20 feet below the deck surface and span across both sides of the entire 1.7-mile bridge. The nets were modeled after bridge barriers that were 100% successful in preventing suicides as well as deterring jumpers (Smith, 2014). The final cost totaled $211 million. Funding for the project came from multiple sources to cover construction, design, and environmental expenses ("Funding," 2020).

Below is an example from the Golden Gate Bridge, Highway and Transportation District (2020) to illustrate how a bridge barrier may be funded by multiple sources:

$74 million	Metropolitan Transportation Commission
$70 million	California Dept. Transportation
$60 million	Golden Gate Bridge, Highway and Transportation District
$7 million	State Mental Health funds via State Budget (Prop 63)
$0.4 million	Other (donations, etc.)

State Laws & Resolutions:

California Government Code §14527.1 ***(AB 755, adopted 10/5/13):*** Requires a project study report or project study report equivalent that is prepared for any new project involving the construction of a new bridge, or the replacement of a bridge with a history of documented suicides, which project is included in the regional transportation improvement program, the interregional transportation improvement program, or the state highway operation and protection program, to include a document demonstrating that a suicide barrier was a feature considered during the project's planning process. Click here for full text.

District of Columbia PR25-0110 ***(adopted 2/7/23):*** Appropriates $850,000 for the design of suicide deterrent barriers at the William Howard Taft Memorial Bridge. Click here for full text.

Maine LD 1220 ***(signed 6/30/23):*** Requires the Department of Transportation to erect and maintain suicide deterrent barriers on the Penobscot Narrows Bridge. Provides a one-time allocation of $2,000,000 for the construction of the barriers. Click here for full text.

New Mexico SM 103 ***(signed 2/13/18):*** Senate Memorial requesting the Department of Transportation to move forward with safety measures at the Rio Grande Gorge Bridge, to provide suicide barriers on the bridge and to create safe accessibility to the bridge for all visitors that is compliant with the federal Americans with Disabilities Act. Click here for full text.

Pennsylvania Bridge Fencing Safety Act (P.L. 435, No. 65) ***(Act 65, adopted 6/28/18):*** Provides for installation of protective fencing on certain State-owned bridges and for powers and duties of the Department of Transportation. Requires that when a bridge is built with a sidewalk or a concrete barrier is installed, modified or rehabilitated on a bridge with a sidewalk over an interstate or other limited access highway, the Department shall install protective fencing. Click here for full text.

Rhode Island H 7123 *(enacted 6/27/22):* Rhode Island's budget for fiscal year (FY) 2023. Includes a $1,000,000 provision to the turnpike and bridge authority to identify and evaluate options to prevent and address the risk of suicide on bridges under its purview. Click here for full text.

Tennessee HJR 134 *(signed 4/10/19)*: House Joint Resolution to recognize the suicidal health crisis at the Natchez Trace Parkway Bridge and fully support the federal delegation in their efforts to rectify this hazard to public safety by encouraging and working with the National Park Service to erect barriers on the portion of the bridge above State Highway 96. Click here for full text.

Vermont H. 876 *(signed 6/2/16):* An act relating to the transportation capital program and miscellaneous changes to transportation-related law. Includes a requirement that the Agency of Transportation study possible suicide prevention measures at the Quechee Gorge Bridge, including physical improvements to the bridge. Click here for full text.

Washington HB 1004 *(signed 4/13/23):* Directs state and local governments to consider installing informational signs about the hazards of diving or jumping from bridges. Allows for the signs to include the 988 Suicide and Crisis Lifeline. Click here for full text.

Existing Federal Law:

MAP-21: Moving Ahead for Progress in the 21st Century [Public Law 122-141] (*adopted 7/6/12*): Authorizes appropriations out of the Highway Trust Fund (HTF) (other than the Mass Transit Account) equal to FY2012 federal highway spending levels plus inflation for FY2013 and FY2014 for: (1) certain new and existing core federal-aid highway programs; (2) the transportation infrastructure finance and innovation program; (3) the federal lands, tribal transportation, and federal lands access programs; and (4) the territorial and Puerto Rico highway program. To authorize funds for Federal-aid highways, highway safety programs, and transit programs, and for other purposes providing that nets on bridges (and other barriers) are eligible for federal funding. Click here for full text.

AFSP's Position: AFSP recognizes the construction of barriers or physical structures as the most effective means of preventing suicides on bridges, tall buildings, or other areas that pose suicide risk due to their height. Barriers should be considered for new construction of all publicly accessible areas of height and when existing structures are being rehabilitated. AFSP advocates for the passage of legislation that encourages, incentivizes, or requires the building of physical barriers at areas that pose suicide risk due to their height and encourages citizens to advocate on behalf of these barriers and to contact and work with state and/or municipal representatives or departments to seek funding or the appropriating of funds for these projects. Reducing access to lethal means is a proven, research-supported component of suicide prevention. AFSP also recognizes the need for more research on this issue so that data collection of deaths by suicide from high structured areas, besides bridges, becomes more consistent; better informing suicide prevention interventions and policies moving forward.

Additional Resources:

- To learn more about suicide prevention on bridges, read the position of the National Suicide Prevention Lifeline.
- This report from the International Parking Institute provides more information on responses to suicide in parking facilities.
- Visit the Suicide Prevention Resource Center to learn more about means restriction for suicide prevention.
- To learn more about why means reduction efforts like bridge barriers are important, check out the Means Matter Campaign.

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