



## Lethal Means Reduction: Bridge Barriers

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**Overview:** According to the latest data from the Centers for Disease Control and Prevention (CDC), in 2019 we lost 47,511 Americans to suicide, making it the 10<sup>th</sup> leading cause of death in the United States overall and the 2<sup>nd</sup> leading cause of death among youth and young adults ages 10-35. That same year, falling deaths (1,183) and drowning deaths (506) accounted for 3.5% of all suicide deaths (CDC, 2021).

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 is currently being 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, 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 National Suicide Prevention Lifeline (1-800-273-8255) 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 as compared to physical barriers, as many suicides have still occurred from bridges where they have been present (Draper, 2017). Therefore, it is important to ensure that in addition to these resources, physical barriers are installed to have the greatest impact on preventing suicide.

A 2006 report out of England evaluated the effectiveness of barriers, signs, telephone hotlines, bridge patrols, and staff trainings in preventing suicide. The study concluded that barriers that physically restrict access are the most effective means of preventing suicides at bridges (National Institute for Mental Health in England, 2006). Similar results were found in a summary report of nine studies on bridge barriers’ effectiveness in New Zealand, the United Kingdom, the United States (DC and Maine), Switzerland, and Canada. The report found an 86% reduction in suicides at those sites (Pirkis et al., 2013).

A barrier not only decreases deaths by suicide in the location, it also aids 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 a bridge 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 six percent of them later died by suicide. In addition, the subsequent reduction in media coverage of suicides by jumping helps remove the allure of bridge locations as “suicide magnets” and helps to reduce copycat suicides.

Several other factors have also been cited for prohibiting barriers along bridges and other high-risk locations. These can be related to a bridge’s aesthetic appeal to pedestrians, the structural integrity of a bridge, its 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, bridge barriers can be the difference between life and death for someone in crisis (Draper, 2017).

**Funding Mechanisms:** Bridge 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 21<sup>st</sup> 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 *21<sup>st</sup> 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).

There had not been much movement on this issue at the federal level since, until the *Barriers to Suicide Act* was introduced in 2019. Reintroduced in February 2021, the bill would require the Department of Transportation to establish a competitive grant program for states and localities to apply for federal funding to install nets and barriers on bridges for suicide prevention. Project funding would also be made explicitly eligible under two existing programs: The Surface Transportation Block Grant and the National Highway Performance Program (Office of U.S. Congressman Don Beyer, 2019).

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.](#)

**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. Calls for 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.](#)

**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.](#)

## Existing Federal Law:

**MAP-21: Moving Ahead for Progress in the 21<sup>st</sup> 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.](#)

## Current Federal Legislation:

**H.R.792 — Barriers to Suicide Act:** 117th Congress (2021-2022): Directs the Secretary of Transportation to establish a grant program to facilitate the installation, on bridges, of evidence-based suicide deterrents, including suicide prevention nets and barriers. The bill also authorizes the Comptroller General of the United States to conduct a study on the effectiveness of suicide prevention nets and barriers for structures other than bridges. [Click here for full text.](#)

**Conclusion:** AFSP recognizes barriers are the most effective means of preventing suicides on bridges and other high structures. Barriers should be considered for new construction of bridges and other high places and when existing structures are being rehabilitated. AFSP advocates for the passage of the *Barriers to Suicide Act* and encourages citizens to advocate on behalf of barriers and to contact state or municipal representatives and work with their state's Department of Transportation 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.

For future steps, in addition to bridges, high structures such as water towers and parking garages also pose a risk for suicides. There are various prevention tools that can be used to combat suicides from these tall structures. Fencing and screening, geofencing, signage that promotes crisis hotlines, and equipment and operational abatement are a few tools that can be used to save lives (International Parking Institute, 2016). AFSP recognizes that we need more research on this issue so that the data collection of deaths by suicide from high structured areas besides bridges is more consistent.

## 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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