Bollards are short traffic posts used to guide traffic, delineate a perimeter, and protect people and property. Their small footprint allows for the free-flow of pedestrian traffic yet proper spacing can effectively block vehicles.

Bollards are easy to overlook, so their versatility can be underestimated. Design options come in classical, modern, industrial, or security aesthetics. Functionally, they can be used for:

- Protection / Vision Zero
- Historical Preservation
- Bike Lanes / Active Transportation
- Wayfinding
- Multi-Use or Variable-Access Spaces
- Placemaking
- Bike Parking
- Lighting

https://www.reliance-foundry.com/cities
Bollards for Vision Zero, Security, and Anti Terrorism

Impact-protective bollards are often installed in areas at risk for vehicle accident or attack. Two types are available:

• **Crash-rated bollards** have an engineered footing and have been independently tested. They have proven stopping power when installed correctly.

• **Security bollards** are made of structural steel pipe filled with and surrounded by concrete. Their impact-protection depends on local conditions and installation method.

Which impact-protective bollard is right for a site depends on budget, surrounding traffic speed, geographical features, and threat level.

Crash-rated bollards provide anti-ram and anti-terrorist protection. Likely vehicle size and speed in an area determine which rated bollard to use. Such engineered bollards are also used in Vision Zero approaches that modify the environment to prevent traffic fatality and injury. They are common protection on sharp bends, plazas, playgrounds, and known pedestrian-vehicle conflict zones.

Impact protective security bollards are often found in parking lots, beside drive-thru windows, and around utility boxes, where speed and active threat levels are low. They are primarily installed for protection against minor accidents and pedal error.

A Brief History Of Bollards

The term “bollard” first appeared in the Oxford English Dictionary in 1844, describing a post used to attach a maritime vessel’s mooring line. The etymology is unclear, but it is likely it was derived from the word “bole,” meaning tree trunk. Over time, the term has been extended to include posts used to guide pedestrian and vehicle traffic.

Although the term is only two hundred years old, bollards have been around for thousands of years. Some of the oldest surviving bollards date from the Roman empire.

Classical bollard designs are influenced by seventeenth and eighteenth-century installations, when it became common practice to make use of decommissioned cannon barrels by half-burying them. These cannon bollards were handy on wharfs for mooring. Inland, they were adapted to directing traffic and protecting stonework.

In the early 1800s, Amsterdam residents installed cast iron bollards in front of their homes and businesses to prevent damage from increasing carriage traffic. The City of Amsterdam eventually followed suit, installing cast iron bollards called Amsterdammertje to delineate pedestrian areas. Although now most cities, including Amsterdam, use curbed roadways as a method of traffic separation, the use of bollards is still a very common strategy for defining different areas in the modern city-scape.
Research into active transportation shows that people cycle and walk where they feel safe and there are amenities close by. Where the infrastructure supports all ages and abilities, a culture of active transport will take root.

Separated bike lanes make a big difference to safety—when they are observed by drivers. The use of traffic delimiters is a common approach: these create a physical separation of the bike lane yet will bend to let emergency vehicles to the curb when necessary. Unfortunately, traffic delimiters or plastic bollards on a spring often rip from the base and leave cyclists feeling more insecure. Although inexpensive up front, these delimiters take time and resources to monitor and replace.

European flexible bollards are much larger than standard delimiters. The polyurethane material bends throughout the bollard body. With thicker diameter and denser material, they make a resonant sound when struck by a vehicle, without damage to vehicle body or bollard. They are less likely to be driven into, but will also survive repeated impacts without breaking.

Flexible bollards are available in a range of colors and can be embedded or installed with a removable mount.

### Bollard Spacing

In pedestrian areas, consider accessibility when site planning. There must be adequate spacing between bollard posts for all pedestrians, including those in wheelchairs and motorized chairs.

Maintain at least 3 feet between each post, and in the case of some fluted or solar bollard designs, be sure that the distance is measured from the furthest protrusion of the bollard. However, do not exceed 5 feet between each post, or the bollard’s ability to protect against a car will be compromised.

On sidewalks, it is recommended that bollards be placed 1.5 feet from the back of the curb in areas where cars may be parked alongside the curb. If there is no vehicle parking in the area where the bollards are to be placed, the bollards can be installed immediately adjacent to the curb. Always be aware of local codes and ordinances.
**Placemaking and Community Spaces**

Vibrant community spaces and street-level engagement sustain the economic and cultural heart of a city. Bollards help create this space by setting a visual boundary and offering protection. With a wide range of styles available, decorative bollards also support local design. Custom caps can be used to create a unique or distinctive atmosphere.

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**Heritage Preservation**

Bollards have a long and varied history. They’ve been guideposts, mooring posts, stonework guards, perimeter demarcation, military installment, and vehicle protection. Such diversity ensures there are many historically accurate styles of bollard to choose from. Planners can pick a style that not only protects but enhances a site’s aesthetic.

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**Multi-Use Spaces**

Density creates a need for flexibility in public space. Removable and retractable bollards can help cities transform streets into plazas, parks into festival space, parking lots into farmers markets, and more. Stow or remove bollards to provide temporary vehicle access; raise or replace to define pedestrian zones. Turn wintertime streets into summertime plazas; create pop-up festival space on weekends and holidays; allow service, emergency or special-event vehicles into pedestrian-only spaces.

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**Wayfinding**

Bollards are understood as markers in their role of traffic guidance and perimeter creation. In wayfinding applications, they can be labeled, lit, linked with chains, or custom designed to show logos or other icons.

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**Bike Bollards**

In addition to providing traffic guidance, bollards can be used for bike parking. Several models allow the addition of bike-locking arms, including lighting bollards, small traffic guidance bollards, and bollards designed to cover security pipes.

Bollards are ADA compliant. Stability is offered with at least two points of contact against the bike frame. When bikes are locked under street lights in visible areas they are less likely to be targeted for theft.

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**Lighting**

Good lighting makes people feel safer at night. It’s an important component of crime prevention through environmental design, and adds to walkability and street level comfort even in daytime in dark winter months.

Lighting bollards can provide path-level lighting that minimizes up-light and glare near residential areas, in parks, and near light-pollution vulnerable plant and animal populations.

Intelligent solar bollards adapt output to local lighting conditions, lowering output over days of dark skies. Matching wired bollards are available for locations where full lumens are needed or the bollard is in full shade.
Choosing Materials

Ductile Iron  
We use ductile cast iron in our classical bollards. This alloy’s microstructure makes it less brittle while maintaining the same weight and look of traditional gray iron. Ductile reduces or eliminates shrapnel during a vehicle accident. It is also better at capturing fine detail in a casting mold, allowing for a cleaner overall finish.

Steel  
Steel’s strength is a vital component of our security or crash-rated bollards. Sleek geometrical bollards which complement modern architectural styles may also be crafted from structural steel.

Stainless Steel  
Stainless steel’s famous rust-resistance comes from chromium that protects the alloy’s silvery luster. We use high-quality 316 stainless steel, which provides additional resistance to salt and de-icing chemicals.

Concrete  
Concrete bollards can left raw to complement a brutalist style or be finished with a covering of river pebbles for a naturalistic look. Available in a variety of shapes and styles.

Aluminum  
Aluminum allows us to offer cast iron bollard designs at a fraction of the weight, making them an ideal option for decorative removable installations.

Polystyrene

Picking the right bollard material depends on function, style, maintenance, and environment.
Finishes for Metal Bollards

Although steel pipe can be shipped raw or primed, and stainless steel may be purchased for its natural finish, most bollards leave our warehouse finished in powder-coat or IronArmor protective covering.

- Manufacturer applied in a range of custom colors
- Complete surface coverage: no pin-hole gaps
- UV, corrosion, chemical, graffiti, and weather resistant
- No volatile organic compounds
- Food and water safe
- Comes with standard 5-year warranty; option to upgrade to 10-year warranty

IronArmor

- Manufacturer applied in a range of custom colors
- Complete surface coverage: no pin-hole gaps

Powder-Coat

- Manufacturer applied in a range of custom colors
- Complete surface coverage: no pin-hole gaps

Where it all comes together.

Parks

Parks can create a consistent aesthetic with bollards that answer many municipal needs.

Bollards linked with chain can separate pedestrian pathways from garden plantings and prevent corner-cutting footpath formation. Bollard lighting with up-light cutoff provides safety while protecting circadian rhythms. Bike bollards set perimeters and give cyclists a place to lock up. Removable or retractable bollards protect entrances from vehicle intrusion while allowing necessary service and emergency vehicles through.

Custom bollard caps can be cast with crests, logos, or other wayfinding or placemaking images.
Best-Selling Products
These popular bollards fill a variety of site needs.

Popular Removable
*R-8464*
A lockable, removable stainless steel bollard. Retractable and coated versions available.

| Weight (lbs): | 26 |
| Function: | Removable |
| Height (in): | 35-1/2 |
| Body Diameter (in): | 4-1/2 |
| Base Diameter (in): | 6.5 |
| Material: | 316 Stainless |

Favorite Modernist Decorative
*R-7576*
The R-7576 can be used as a standalone bollard or as a cover for an impact resistant core.

| Weight (lbs): | 51 |
| Function: | Bollard/cover |
| Height (in): | 34 |
| Body Diameter (in): | 5-3/4 |
| Base Diameter (in): | 5-3/4 |
| Material: | Ductile Iron |
| Max. Interior Pipe Height (in): | 31 |
| Max. Interior Pipe Diameter (in): | 4-1/2 |

Top-Selling Flexible
*R-8323*
Available in three colors with a reflective stripe option. Fixed or removable mounts available.

| Weight (lbs): | 6 |
| Function: | Flexible |
| Height (in): | 34 |
| Body Diameter (in): | 3-7/8 |
| Material: | Polyurethane |

Best-Selling Stainless Cover
*R-7303*
The R-7303 is our most popular stainless steel bollard cover, providing elegance and weathering protection to security or crash-rated steel pipe bollards.

| Weight (lbs): | 26 |
| Function: | Bollard/cover |
| Height (in): | 36 |
| Body Diameter (in): | 6-1/4 |
| Base Diameter (in): | 316 |
| Material: | Stainless |
| Max. Interior Pipe Height (in): | 34 |
| Max. Interior Pipe Diameter (in): | 4-1/2 |

The Martello Diverter
*R-7651-EM*
The Martello works like traditional bell bollards – when a vehicle cuts a corner too tightly, it catches the wheels and returns them to the road. Buy America Act compliant.

| Weight (lbs): | 180 |
| Function: | Diverter bollard |
| Height (in): | 22-1/2 |
| Body Diameter (in): | 13-1/2 x 14 |
| Base Diameter (in): | 24-1/2 x 25-1/2 |
| Material: | Steel |

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| Material: | Steel |
**Favorite Classical Decorative**

*R-7591*

The R-7591 can be used as a standalone bollard with fixed or removable mounting options, or as a cover for an impact-resistant core.

- **Weight (lbs):** 79
- **Function:** Bollard/cover
- **Height (in):** 31-3/4
- **Body Diameter (in):** 5-7/8
- **Base Diameter (in):** 10-1/4
- **Material:** Ductile Iron
- **Max. Interior Pipe Height (in):** 25
- **Max. Interior Pipe Diameter (in):** 4-1/2

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**K-12/M50 Rated Bollard**

*R-1009-12*

This crash-rated bollard is tested to stop a 15,000-lb midsize truck travelling at 50 MPH. Can be covered with a number of decorative bollards to enhance site design.

- **Weight (lbs):** 1260
- **Function:** Crash-Rated
- **Height (in):** 75
- **Body Diameter (in):** 10-3/4
- **Base Diameter (in):** 10-3/4
- **Material:** Steel

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**Popular Bike Bollard**

*R-7906*

Bike bollards can be installed on fixed, removable, or fold-down/collapsible mounts. Holds 2 bikes.

- **Weight (lbs):** 42
- **Function:** Bike Bollard
- **Height (in):** 36
- **Body Diameter (in):** 20
- **Base Diameter (in):** 4-1/3
- **Material:** Steel
Since 1925, Reliance Foundry has been delivering the highest-quality stock and custom municipal fixtures. Browse our bollards, bike racks, trench grates, tree grates, and detectable warning plates online. Any questions? Custom requests? Get in touch: we’re here to help with answers and expertise.

Reliance Foundry
making places people want to be.