

ROAD SAFETY

# Why Guardrails Bend: The Hidden Engineering of Bulgaria's "Mantineri"

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From forgiving roadsides and crash-tested systems to European factories, Bulgarian contracts and post-crash investigations, the roadside mantinela is one part of a much larger safety system.

ENGINEERING • BULGARIAN INDUSTRY • PROCUREMENT • CRASHES

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A steel ribbon follows the edge of almost every Bulgarian motorway. It looks simple: a corrugated beam, a row of posts and a few bolts. In everyday Bulgarian it is a *мантинела*—*mantinela*. The legal terms are *предпазна ограда* (safety barrier), forming part of an *ограничителна система за пътища* (road restraint system).

That distinction matters. A good barrier is not designed merely to be strong, and it is not supposed to stop every vehicle dead. Its job is to contain or redirect an errant vehicle while keeping the forces on its occupants within tested limits. It must also leave enough room to deform, connect safely to bridges and other barriers, and begin and end without becoming a spear-like hazard of its own.

This is why there is no meaningful answer to “Is this rail thick enough?” without knowing the complete system behind it.

## Roadside passive safety and vehicle-restraint systems

A *mantinela* is not a “horizontal safety measure” in the road-engineering sense. Horizontal signalisation means markings on the carriageway; vertical signalisation means signs and other upright signalling devices. A guardrail belongs elsewhere: first to the wider field of **roadside passive safety**, and more narrowly to the family of **vehicle-restraint systems**.

“Passive” does not mean optional or inactive. It means that the infrastructure limits the consequences after control has already been lost, without waiting for a driver command, a police intervention or an electronic warning. The distinction also prevents a common conceptual mistake: roadside passive safety is not one manufactured product category or one EN standard. It is a design approach. EN 1317 barriers, parapets, terminals and crash cushions are one subset of that approach.

### Where the *mantinela* fits in a forgiving roadside

The modern starting point is the [Safe System idea](#): people make mistakes and the road system should be designed so that an ordinary mistake does not end in death or life-changing injury. Preventive measures try to keep the vehicle on a predictable path through legible geometry, markings, speed management, skid resistance and warnings. A **forgiving roadside** takes over when those layers fail and a vehicle leaves the carriageway.

This matters because run-off-road crashes are disproportionately severe. The CEDR-funded [SAVeRS vehicle-restraint guideline](#), citing the earlier EU RISER research, reported that single-vehicle events formed about 10% of the crashes in its dataset but 45% of fatal crashes. That is a historical research finding, not a current Bulgarian annual statistic, but it explains why a seemingly empty verge is part of the safety system.

The accepted hierarchy is not “put a barrier everywhere.” The [CEDR forgiving-roadsides guidance](#), SAvERS and [PIARC’s Road Safety Manual](#) all lead to the same sequence:

- **Remove the hazard** where reasonably possible.
- **Redesign it to be safely traversable**, for example by treating an abrupt drainage feature or unsafe slope.
- **Relocate it farther from traffic**, giving an errant vehicle more space to recover or decelerate.
- **Make it passively safe**, such as a breakaway or energy-absorbing support assessed under [BDS EN 12767:2019+A1:2025](#).
- **Install a vehicle-restraint system** when the remaining hazard cannot reasonably be removed or made safer and striking the restraint system is expected to be less severe than reaching what lies behind it.

A clear zone is therefore not simply “unused land,” and it has no universal width. Its useful dimensions depend on speed, traffic, curvature, slope, roadside geometry and the consequences beyond it. A barrier is itself an object that can be struck, so it is the final shielding step, not the automatic first response.

## The roadside passive-safety toolbox

The following groups are related, but they are not interchangeable. The linked pages provide useful diagrams, photographs or technical examples; commercial product pages illustrate a type and are not endorsements.

| Passive-safety measure or system       | Typical examples and visual references                                                                                                                                                                                            | How it reduces harm                                                                                                             |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Recovery space and forgiving geometry  | Clear zones, stable shoulders, traversable slopes and ditches; illustrated in the <a href="#">CEDR Forgiving Roadsides Design Guide</a>                                                                                           | Gives an errant driver room to regain control or lose speed without hitting a rigid object or overturning                       |
| Hazard removal, relocation or redesign | Moving isolated trees or poles, flattening unsafe slopes, making culvert ends traversable and keeping fixed objects outside the recovery area                                                                                     | Eliminates the collision or reduces the probability that the vehicle reaches the hazard                                         |
| Passively safe roadside equipment      | Breakaway, yielding or energy-absorbing lighting columns and sign supports assessed under <a href="#">EN 12767</a>                                                                                                                | Manages its own failure during impact so the support is less injurious; it is expressly not an EN 1317 vehicle-restraint system |
| Longitudinal safety barriers           | Roadside and median steel, concrete, cable or tested wood-and-steel systems; see the illustrated <a href="#">voestalpine steel range</a> , <a href="#">REBLOC concrete systems</a> and <a href="#">Tertu wood-and-steel range</a> | Contains and redirects a vehicle away from a more serious hazard, opposing traffic or an exposed edge                           |
| Vehicle parapets                       | Tested barriers anchored to bridges, retaining structures and other elevated works; <a href="#">Tubosider's Genoa bridge example</a> shows a high-containment application                                                         | Prevents a vehicle from leaving a structure; the anchorage and loads transferred into the deck are part of the design problem   |

| Passive-safety measure or system           | Typical examples and visual references                                                                                                                                                                                                       | How it reduces harm                                                                                                                           |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Terminals and transitions                  | Crashworthy barrier ends and engineered connections between systems of different geometry or stiffness; see the <a href="#">illustrated terminal update</a>                                                                                  | Treats exposed ends and avoids an abrupt stiffness change that could spear, pocket or destabilise a vehicle                                   |
| Crash cushions                             | Redirective or non-redirective energy-managing devices in front of point hazards and at diverges; see <a href="#">illustrated steel examples</a>                                                                                             | Decelerates, contains or redirects a vehicle where a long longitudinal barrier cannot adequately shield the hazard                            |
| Temporary, removable and mobile protection | Temporary barriers at works, emergency-opening or median-gate sections, and specialised truck-mounted attenuators; <a href="#">CEN/TS 1317-9</a> covers removable sections and <a href="#">CEN/TS 16786</a> covers truck-mounted attenuators | Separates live traffic from workers or opposing flow while preserving an engineered access or operational function                            |
| Motorcycle protection                      | Lower rails, screens or systems designed to reduce the severity of a sliding rider striking barrier posts; see <a href="#">CEN/TS 17342</a> and this <a href="#">photographed system example</a>                                             | Reduces direct contact with posts and openings; it supplements rather than replaces the barrier's vehicle-restraint performance               |
| Pedestrian and combined parapets           | Pedestrian parapets and systems combining pedestrian fall protection with a tested vehicle parapet; see <a href="#">CEN/TR 16949</a>                                                                                                         | Protects people at an exposed edge; a pedestrian fence is not automatically a vehicle barrier, and each claimed function must be demonstrated |

Other specialised passive measures include arrester beds on steep descents and protection around work vehicles. They answer different hazards and should not be labelled “mantineli” simply because they restrain movement.

### What exactly is a *mantinela*?

In everyday Bulgarian, the word usually means the long corrugated steel barrier beside a road or in a central reservation. Bulgaria's current [road-restraint ordinance, Ordinance No. RD-02-20-1 of 1 April 2024](#), uses the more precise concepts of safety barriers and road-restraint systems and covers longitudinal barriers, vehicle parapets, terminals, transitions, crash cushions, removable sections, motorcycle protection and combined parapets.

Even the familiar steel barrier is a complete assembly, not one rail. Its **contact face**—a steel beam, cable or concrete profile—engages the vehicle. **Posts, anchors and foundations** transfer the impact into soil, a bridge deck or a base. **Spacers, bolts, splices and connectors** control continuity, wheel interaction and deformation. **Terminals, transitions and minimum effective length** determine whether the system works safely at its ends and interfaces. Changing any of those details can change the result.

## A controlled crash, not an indestructible wall

When a vehicle strikes a deformable steel barrier at an angle, the rail, posts, soil and vehicle all move. This spreads the change in momentum over more time and distance. Some energy is dissipated through deformation and friction, while the barrier guides the vehicle toward a safer trajectory.

That controlled movement is intentional. A comparatively flexible steel or cable system may moderate occupant loads but needs clear deformation space behind it. A rigid concrete barrier moves very little and can fit into a constrained median, but it changes the way impact forces are transmitted to the vehicle. A bridge parapet must contain the vehicle without imposing unacceptable loads on the supporting structure. None of these materials is inherently “best” in every location.

The strongest or highest-containment barrier is therefore not automatically the safest choice. Designers must balance at least four performance questions:

- **Containment:** which standardised vehicle impact the system can contain and redirect.
- **Occupant impact severity:** comparative measures of the forces experienced in the test vehicle.
- **Deformation and intrusion:** how far the barrier and the impacting vehicle move laterally.
- **Post-impact trajectory:** whether the vehicle is redirected without excessive rollover, rebound or return into dangerous traffic.

The EN 1317 test result describes performance in defined conditions, not invulnerability. A real vehicle can be heavier, faster, more sharply angled or differently loaded than the test vehicle. A system may deform dramatically and still have performed its protective function; it may also look almost intact while hidden posts, anchors or connections have been damaged.

## No universal shape, size or thickness

**There is no single European guardrail shape, beam length, post spacing, height or steel thickness.** The EN 1317 family is primarily performance-based: it tests and classifies the complete assembly.

Several forms are nevertheless familiar across Europe:

| Common system                         | Recognisable form                                   | Indicative scale—not a legal universal dimension                                                           |
|---------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <a href="#">Two-wave steel beam</a>   | Corrugated W-shaped face                            | The overall vertical profile is commonly around 300–310 mm high; the sheet is only a few millimetres thick |
| <a href="#">Three-wave steel beam</a> | Deeper “thrie-beam” face with three corrugations    | Commonly about 500 mm high and often used in stiffer or higher-containment configurations                  |
| <a href="#">Concrete barrier</a>      | New Jersey, F-shape, step or another tested profile | Height, base width, reinforcement, segment connections and anchorage depend on the system                  |
| <a href="#">Wire-rope barrier</a>     | Several tensioned steel cables on yielding posts    | Cable count, height, post spacing, anchors and pre-tension are system-specific                             |

| Common system                          | Recognisable form                                                  | Indicative scale—not a legal universal dimension                                                                                        |
|----------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Wood-and-steel barrier</a> | Structural steel restraint with tested timber elements or cladding | The wood is not a decorative licence to change the steel system; profiles, fixings and transitions belong to the assessed configuration |
| Vehicle parapet                        | Steel, concrete or combined system on a structure                  | Geometry and anchorage must suit both crash performance and structural loads                                                            |

These figures help identify a shape; they do **not** establish compliance. The familiar “roughly 3 mm” description is only a rule of thumb, not a European safety class. A thinner beam made from a different steel, or a thicker beam on the wrong posts, can behave very differently.

The tested configuration can include steel grade, profile and thickness; hole pattern; post section and driven depth; post spacing; spacer type; rail height; bolt grade; splice arrangement; foundations; anchors; terminals; transitions; and minimum effective length. Substituting apparently similar parts, widening post spacing or placing a rigid object inside the tested working width can change—or invalidate—the declared performance.

### Where European practice is moving

The underlying principle remains stable—remove or soften the hazard before shielding it—but European practice is becoming more system-specific:

- **Assessment is becoming more proactive and network-wide.** [Directive \(EU\) 2019/1936](#) strengthened infrastructure-safety management beyond isolated crash locations and expressly brought roadside features, clear zones and restraint systems into the assessment picture.
- **Ends and interfaces receive more attention.** The 2023–2024 documents for terminals, transitions and removable barrier sections move the discussion beyond the long central rail to the places where real installations often become discontinuous.
- **Selection is increasingly risk- and lifecycle-based.** The CEDR SAVeRS work compares the need for a barrier, expected crash exposure, containment, road geometry and whole-life cost instead of treating the highest class as the default answer.
- **Motorcyclists are a distinct design case.** CEN/TS 17342 provides a dedicated assessment route for systems intended to reduce the severity of a sliding-rider impact, while the European Commission’s [powered-two-wheeler review](#) highlights forgiving roadsides and rider-friendly protection.
- **Constrained medians, bridges, tunnels and work zones drive specialised solutions.** Low working width, low structure loads, temporary protection and rapid removable sections matter alongside containment.

- **The changing vehicle fleet is forcing renewed scrutiny.** Heavier vehicles, SUVs and electric vehicles raise questions about how older test fleets represent present traffic. Manufacturer-led EV tests are useful evidence, but they do not replace the published EN 1317 classifications.
- **Environmental performance is entering procurement.** At its [2026 Intertraffic review](#), the European Union Road Federation highlighted Environmental Product Declarations, lifecycle assessment, recyclable materials and circular design. These considerations supplement crash performance; they do not excuse a lower safety class or an untested modification.

CEN launched the preparatory [TRUST revision project](#) for the EN 1317 family in July 2026. Until replacement standards are published and brought into the applicable legal framework, however, the current editions and national selection rules remain the basis for projects and conformity claims.

## How are road barriers made?

### Steel systems

Steel sheet or coil of a specified grade is cut and punched, then cold roll-formed or pressed into the rail and post profiles. Spacers, plates and connectors are fabricated separately. The components receive corrosion protection, commonly by hot-dip galvanising, and the fasteners are produced to their specified grades and coatings.

The Bulgarian ordinance requires metal components and fasteners in these systems to be hot-dip galvanised in accordance with **BDS EN ISO 1461**, and generally prohibits electrochemically coated fasteners and cutting or welding after galvanising, apart from permitted coating repairs. [BDS EN ISO 1461:2023](#) is a corrosion-protection standard; it does not prove crash performance.

### Concrete systems

Concrete barriers may be precast in a factory or cast in place. Their safety depends on more than the visible profile: concrete properties, reinforcement, segment connections, anchors, foundations and joints all form part of the assessed configuration. A rigid barrier may remain visibly straight after a collision while its connectors, anchorage or supporting structure still require inspection.

### Cable systems

Wire-rope barriers use galvanised high-tensile strands, yielding posts, end anchors and tensioning assemblies. The cable layout and pre-tension are essential. Installing the right cables on the wrong anchors is not the tested system.

Product-type assessment is based on full-scale impact testing. Series-manufactured units are then kept consistent through factory production control. For products covered by the harmonised route, a notified product-certification body is involved under AVCP System 1.

## Who manufactures vehicle-restraint systems in the EU?

Europe does not have one standard guardrail or one simple list of guardrail factories. Its supply chain includes system developers, steel fabricators, galvanising plants, precast-concrete licence networks, cable-system specialists, crash-cushion makers, distributors and installation contractors. Those are legally and technically different roles.

The **system developer or brand owner** controls the tested design. The **legal manufacturer** places the product on the market and issues the product-specific Declaration of Performance. A **physical or licensed factory** forms, welds, galvanises or casts the components under factory production control. A **distributor** can sell the system without making it, while an **installer** builds it on the road and must follow the approved project and installation manual. A notified body assesses the tasks assigned under the construction-products framework; it does not select the appropriate barrier for the road.

This distinction is especially important in cross-border groups. A concrete-system company may license local precasters because transporting heavy units over long distances is inefficient. A German system owner may source components from Poland, Italy or Bulgaria. A Spanish group may use several related brand and factory names. The company logo in a catalogue is therefore not proof of which plant made the barrier at a particular kilometre.

The table below is a **representative, evidence-based map**, not an exhaustive EU register, endorsement or market-share ranking. It prioritises companies with a documented EU production base or a clearly disclosed licensed-production model and includes direct links to official photographs and technical pages. The [European Union Road Federation's vehicle-restraint working group](#) lists additional manufacturers, suppliers, testing organisations and sector bodies, but membership itself is not proof that a named company manufactured a particular installed system.

| European manufacturer or system owner                           | Publicly documented EU production model                                                                                                                                                                                                                       | Main vehicle-restraint products and useful official visual                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">MEISER Road Safety</a> , Germany                    | The group identifies production sites at <a href="#">Schmelz-Limbach, Germany</a> , and <a href="#">Jawor, Poland</a> .                                                                                                                                       | Galvanised-steel permanent and bridge systems, temporary barriers and movable median gates; illustrated examples include <a href="#">SUPER-RAIL</a> and <a href="#">VARIO-GUARD</a> .                                                                                                                                    |
| <a href="#">voestalpine Krems Finaltechnik</a> , Austria        | The Krems business describes in-house development, production, final processing and delivery of road-safety systems.                                                                                                                                          | Steel roadside, median and bridge barriers, transitions, terminals and redirective or non-redirective crash cushions; its product page and <a href="#">illustrated assembly manual</a> show how a complete configuration is documented.                                                                                  |
| <a href="#">DELTABLOC International</a> , Austria               | An Austrian system developer and brand owner whose <a href="#">licence model</a> relies extensively on approved local production partners. The project documents must identify the actual producer.                                                           | Precast and in-situ concrete barriers, steel systems, temporary work-zone products and urban restraint; see <a href="#">permanent-barrier photographs</a> .                                                                                                                                                              |
| <a href="#">REBLOC</a> , Austria                                | Based at Gars am Kamp; the company says it develops, produces and markets precast-concrete vehicle-restraint systems, including local production arrangements.                                                                                                | Permanent and temporary concrete barriers, bridge systems, transitions and terminals; see the <a href="#">product finder</a> and <a href="#">bridge solutions</a> .                                                                                                                                                      |
| <a href="#">Marcegaglia Buildtech</a> , Italy                   | The company states that its complete steel road-barrier range is made at the <a href="#">Pozzolo Formigaro plant</a> in Piedmont.                                                                                                                             | Galvanised two- and three-wave roadside, median and bridge systems, parapets, terminals, connections and motorcycle lower rails; see this <a href="#">H2 system example</a> .                                                                                                                                            |
| <a href="#">Tubosider</a> , Italy                               | Headquarters and a documented production plant are at Monticello d'Alba; published conformity paperwork identifies further Italian production locations for specific systems.                                                                                 | Steel road and bridge barriers from normal to very high containment; its <a href="#">CE page</a> and <a href="#">Genoa bridge case</a> provide product and installation evidence. Maccaferri markets systems developed with Tubosider, so the two names should not automatically be counted as separate physical chains. |
| <a href="#">SMA Road Safety</a> , Italy                         | The company identifies its headquarters and operating site at Marcianise, Caserta, and describes Italian production.                                                                                                                                          | Specialist steel crash cushions, terminals, longitudinal and temporary barriers, movable gates and connected impact-monitoring products; see its <a href="#">crash-cushion overview</a> and <a href="#">Andromeda barrier</a> .                                                                                          |
| <a href="#">Road Steel / Hiasa, Gonvarri Industries</a> , Spain | The Road Steel operation at Cancienes, Corvera, Asturias, describes research, design, manufacture, installation and marketing. Hiasa, Road Steel and Gonvarri names belong to the same industrial structure and should not be counted as unrelated producers. | Metal roadside and median barriers, parapets, terminals, cushions, transitions, motorcycle protection and mixed systems; see the <a href="#">Gonvarri Asturias road portfolio</a> .                                                                                                                                      |
| <a href="#">Metalgalva</a> , Portugal                           | A Trofa-based steel-fabrication group with industrial production and <a href="#">hot-dip-galvanising capability</a> . Public sources do not map every product to an individual group plant.                                                                   | Steel road and bridge barriers, parapets, terminals, attenuators and motorcycle protection; the <a href="#">road-solutions catalogue</a> provides drawings and photographs. Its concrete offer is associated with DELTABLOC and should be identified accordingly.                                                        |
| <a href="#">Tertu Equipements</a> , France                      | Tertu states that it has two French production sites and gives its main address at Villedieu-lès-Bailleul, Normandy; the public English page does not name the second plant.                                                                                  | A specialist range of crash-tested wood-and-steel road and bridge barriers, transitions and motorcycle protection; see the <a href="#">illustrated product range</a> . Crash cushions sold by Tertu under another manufacturer's brand should be treated as distributed products unless project documents say otherwise. |
| <a href="#">Stalprodukt</a> , Poland                            | The Bochnia-based company describes in-house steel-barrier production and galvanising, although its public pages do not assign every current system to a specific line.                                                                                       | Galvanised steel roadside, median and bridge systems; its <a href="#">technical catalogue</a> shows materials, components and configurations.                                                                                                                                                                            |
| <a href="#">Blue Systems / SAFENCE</a> , Sweden                 | A Swedish developer and supplier of high-tension cable-barrier systems. Its current public site identifies the business address but not the physical fabrication plant, so plant-level manufacture remains unverified without the product documents.          | Three- and four-rope N2, H1 and H2 systems and their terminals; the company's <a href="#">technical explainer</a> illustrates how cable restraint differs from beam and concrete systems.                                                                                                                                |

The sample shows several wider patterns. Steel production is geographically distributed and often combines roll-forming, fabrication and galvanising within one group. Heavy precast concrete favours local or licensed manufacture. Specialist companies increasingly design the entire interface around the long barrier—terminals, transitions, cushions, bridge connections, motorcycle protection, removable gates and work-zone products. Wood-and-steel and cable systems remain genuine specialist categories, not decorative variants of a standard W-beam.

For a particular Bulgarian project, the evidence chain should identify the exact system developer, legal manufacturer, physical plant or licensee, distributor and installer. The strongest documents are the product’s Declaration of Performance, plant-specific factory-production-control certificate, batch and delivery traceability, installation log and as-built acceptance record. A European or Bulgarian manufacturer list is not a list of tender winners, and a tender winner is not automatically the producer.

### Bulgaria: verified production bases

“Bulgarian manufacturer” can likewise describe several different roles: the owner of a certified system, the factory that forms and galvanises its steel, a component maker, an importer, or a contractor that installs another company’s product. They should not be collapsed into one label.

The strongest public evidence found in this review supports three currently active Bulgarian production bases for complete steel road-restraint systems, plus one further factory whose published product certificate had expired. This is a documented list, not a claim that no other producer exists. Factory-capacity statements below come from the companies themselves; project acceptance still requires current documents for the exact system supplied.

| Company and evidence status                                                                                                                                                                                                      | Where                                                                                          | Publicly documented products, materials and processes                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">KMV Systems for Road Safety</a> —documented current production base                                                                                                                                                  | <b>Pernik</b> , 1 Vladaysko vastanie Street                                                    | Steel two- and three-wave EasyRail systems; profiling, bending and welding equipment; an in-house hot-dip-galvanising line. KMV says six EasyRail configurations underwent type/crash testing, initial factory inspection and continuing production control through TÜV SÜD Austria.                                                                                                                      |
| <a href="#">Jupiter 05</a> —documented current production base. The former <a href="#">Jupiter 05 OOD, EIK 115578467</a> , was deleted on 6 August 2025; current records identify <a href="#">Jupiter 05 AD, EIK 208430365</a> . | <b>Plovdiv</b> , Komatevo Ring Road; separate galvanising plant on the Plovdiv–Asenovgrad road | Steel road and bridge systems from N2 through H4b, terminals, cushions and related products. The published factory inventory includes roll-forming and roll-bending machines, presses, cutting and welding equipment; the galvanising plant reports a 13 × 1.6 × 3.2 m zinc bath. One <a href="#">published system example</a> identifies S235JR steel, but that grade is not universal across the range. |
| <a href="#">ZPT AD</a> —documented current production base with the clearest public product-specific paperwork found                                                                                                             | <b>Straldzha</b> , Industrial Quarter 1                                                        | Cold-formed steel profiles and SPO-97 steel barriers, plus an in-house <a href="#">hot-dip-galvanising shop</a> . Its <a href="#">10 June 2025 Declaration of Performance for SPO-97 M3/2.0</a> identifies EN 1317-5, notified body 1853, class N2/A/W3 and hot-dip-galvanised steel with a declared coating of at least 70 µm—for that model.                                                            |
| <a href="#">Siminvest OOD</a> —                                                                                                                                                                                                  | <b>Radomir</b> , 36 Ivan                                                                       | The company describes production and construction of steel SPO-97                                                                                                                                                                                                                                                                                                                                         |

| Company and evidence status                                                                    | Where        | Publicly documented products, materials and processes                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| physical/historical manufacturer; current conformity not established by the published document | Vazov Street | barriers at its base and publishes <a href="#">Certificate of Constancy of Performance No. 1938-CPR-0416</a> for the Radomir site. The displayed certificate, however, states validity only to <b>1 September 2024</b> , so a buyer should require a current certificate or other evidence of continuing validity and a current product-specific Declaration of Performance before treating the system as currently certified. |

Two further distinctions prevent double-counting. A published [manual for one PASS+CO H1 bridge system](#) says the components of that system are made at the Jupiter 05 plant; it does not establish a separate Bulgarian factory or where every PASS+CO design is produced. Zincometal Bulgaria advertises EN 1317 barriers and has a Sliven site, but its [Bulgarian corporate profile](#) identifies that site with lighting-column production, while the parent manufacturer is Greek and [based in Kilkis](#). No factory-specific Declaration of Performance or production-control evidence was found showing EN 1317 barrier manufacture in Sliven. On the accessible evidence, it is safer to describe Zincometal as a Bulgarian market presence rather than a verified Bulgarian guardrail factory.

The fabrication chain is described in the previous section. For project acceptance, the decisive details remain product-specific: steel grade, thickness, coating, hole pattern, fasteners and every other assessed component must come from the exact Declaration of Performance, drawings and installation manual. A factory's general ISO certificate or galvanising capacity does not make every rail it can form an EN 1317 system.

## Decoding EN 1317

The central European framework is the **EN 1317** family, adopted in Bulgaria as BDS EN standards. It is a CEN European standard family, not a single ISO guardrail standard.

| Document                                   | Main role                                                                                           |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <a href="#">BDS EN 1317-1:2010</a>         | Terminology and general test criteria                                                               |
| <a href="#">BDS EN 1317-2:2010</a>         | Performance classes and impact tests for safety barriers and vehicle parapets                       |
| <a href="#">BDS EN 1317-3:2010</a>         | Crash-cushion performance and tests                                                                 |
| <a href="#">BDS EN 1317-5:2007+A2:2012</a> | Product requirements, durability and conformity assessment; the currently cited harmonised standard |
| <a href="#">CEN/TS 1317-7:2024</a>         | Barrier terminals                                                                                   |
| <a href="#">CEN/TS 1317-9:2024</a>         | Removable barrier sections                                                                          |
| <a href="#">CEN/TR 1317-10:2023</a>        | Transitions and connections                                                                         |

| Document                                  | Main role                                                                                                                         |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">CEN/TS 17342:2019</a>         | Motorcycle-protection systems attached to barriers                                                                                |
| <a href="#">CEN/TR 16949:2016</a>         | Pedestrian-restraint systems and pedestrian parapets                                                                              |
| <a href="#">CEN/TS 16786:2018</a>         | Separate assessment framework for truck-mounted attenuators used to protect mobile and short-duration works                       |
| <a href="#">BDS EN 12767:2019+A1:2025</a> | Separate passive-safety assessment for supports such as sign and lighting columns; expressly not a road-restraint-system standard |
| <a href="#">BDS EN ISO 1461:2023</a>      | Supporting requirements for batch hot-dip-galvanised coatings                                                                     |

Only Part 5 is presently cited as a harmonised standard for the CE route; Parts 1–3 supply its terminology, classifications and tests. The complete European harmonised citation includes **EN 1317-5:2007+A2:2012/AC:2012**. CEN began a revision project for the family in July 2026, but that work has not yet produced replacement editions.

The familiar codes describe tested behaviour. For example, a label such as **H2, W4, A** communicates three different things:

- **H2 containment:** the standard programme includes a 13-tonne bus impact at 70 km/h and 20 degrees, together with the required small-car assessment.
- **W4 working width:** the system occupied no more than 1.3 m laterally in its defining test.
- **A impact severity:** the measured occupant-severity indices fell within the lowest of the standard A–C bands.

These are test classifications, not promises about every real crash. A different impact angle, vehicle, load, soil or installation can produce a different result. Working-width classes run from W1, no more than 0.6 m, to W8, no more than 3.5 m. That space must remain available: a W4 barrier placed 30 cm in front of a rigid tree does not magically become a 30 cm system.

For projects and works within the scope of Bulgaria’s 2024 ordinance, permanent barriers must be at least **N2** and temporary barriers at least **T3**. Those are starting points: the project may require H- or L-level containment because of speed, heavy traffic, a bridge edge, a narrow median or the consequences of penetration.

## CE marking: what it proves—and what it does not

For a restraint product within the scope of harmonised **EN 1317-5**, the manufacturer follows the construction-products framework, maintains factory production control, obtains the required third-party certification under **Assessment and Verification of Constancy of Performance System 1**, issues a **Declaration of Performance**, and affixes the CE mark.

The CE mark connects the supplied product to its declared, assessed characteristics. It is not an award for “best quality,” an EU choice of barrier for a particular road, or proof of correct installation. A CE-marked N2 system cannot replace an H2 system where the approved project requires H2. Nor does the mark make parts from different manufacturers interchangeable.

There is a legal transition to understand in 2026. The EU’s new [Construction Products Regulation, Regulation \(EU\) 2024/3110](#), generally applies from 8 January 2026. Under its Article 95 transition, products covered by a legacy harmonised standard such as EN 1317-5 continue to use [Regulation \(EU\) No 305/2011](#)’s Declaration of Performance and CE route until that standard’s reference is withdrawn or replaced. As of 6 August 2026, EN 1317-5 remains on the European Commission’s [current harmonised-standards list for construction products](#).

One subtlety is often lost in sales language: not every related component has identical CE status. Temporary barriers are outside the present harmonised scope of Part 5, while current documents for terminals and transitions are a Technical Specification and a Technical Report rather than harmonised ENs. Their performance and acceptance still matter, but one should not casually claim that every terminal, transition or temporary product is CE-marked “under EN 1317-5.”

Generic ISO certificates also answer different questions. **ISO 9001** concerns an organisation’s quality-management system. **ISO 39001** concerns road-traffic-safety management. **EN ISO 1461** concerns galvanised coatings. None replaces crash classification to EN 1317.

## How installation changes from one road to another

The road authority and qualified designer first decide whether a barrier is necessary, then specify its exact position, containment, impact severity, working width, effective length, terminals and transitions. The contractor must install the declared configuration and follow the manufacturer’s instructions.

| Road situation                               | Main Bulgarian design and installation considerations                                                                                                                                                                                                                                                       |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ordinary road outside a settlement           | The barrier face is normally at least 0.50 m from the pavement edge; 0.30 m is an exceptional justified minimum. The area in front of and behind the barrier is normally compacted to at least 95%, and the working-width zone must generally remain free of obstructive hazards.                           |
| Motorway or express road at 100 km/h or more | Restraint is generally continuous in the median and along the right shoulder, except at defined ramps, junctions and facilities. Ends, gaps and diverges require safe treatments; a bare exposed beam end is unacceptable.                                                                                  |
| Divided road or central reservation          | Bulgarian rules generally require continuous restraint where there are at least two carriageways and the permitted speed is 50 km/h or more. Narrow medians may require a double-sided or low-deflection solution. A daily flow above 5,000 vehicles over 12 tonnes requires H4b containment in the median. |
| Bridge or retaining structure                | A fall greater than 1 m triggers vehicle-restraint requirements, generally from H1 to H4b according to risk. Anchors and the bridge deck must carry the test loads, expansion joints                                                                                                                        |

| Road situation                  | Main Bulgarian design and installation considerations                                                                                                                                                                                                                      |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | need compatible details, and the roadside barrier must connect through a proper transition.                                                                                                                                                                                |
| Urban street                    | The need for vehicle restraint is balanced with pedestrians, access and lower speeds. At structures and beside play or recreation areas, the rules distinguish vehicle, pedestrian and combined parapets. A pedestrian railing alone does not provide vehicle containment. |
| Roadworks and temporary layouts | At least T3 is required under the Bulgarian ordinance. The temporary system must be installed in its tested connected, pinned, anchored or free-standing configuration; rearranging units can alter performance.                                                           |
| Tight motorcycle-risk curve     | Where the ordinance's speed, curve, traffic or collision criteria are met, the system needs motorcycle protection—often a lower continuous rail or screen tested with that particular barrier model.                                                                       |

Length is as important as strength. The minimum effective length comes from the system's impact assessment, and the installed length must cover the hazard plus the necessary approach and departure. Outside settlements, Bulgaria generally does not allow a gap of less than 100 m between adjacent barrier sections. Short, isolated pieces can leave the vehicle reaching the hazard before the barrier has developed its tested behaviour.

Transitions deserve equal attention. A flexible steel barrier bolted abruptly to a rigid bridge parapet can create a pocket or snagging point. A tested or properly assessed transition changes stiffness and geometry progressively. The same logic applies to terminals: folding, burying or flaring an end is safe only when it follows the approved detail for that situation.

## Who commissions, installs and checks guardrails in Bulgaria?

Responsibility follows the legally designated road manager, not the nearest guardrail factory. Under Bulgaria's [Road Act](#), the Road Infrastructure Agency (API) manages the republican road network, mayors manage municipal roads, and private owners manage private roads. Management includes planning, procurement, financing and control of construction, repair and maintenance. On republican-road sections within urbanised territory, API and the municipality carry out maintenance jointly under an agreement.

| Situation                     | Manager, owner or public employer                                                                                         | Who may appear on site                                                                                                                                                                        |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing republican road      | API, usually acting locally through one of its 27 regional road administrations ( <i>Oblastno patno upravlenie</i> , OPU) | The contractor under the relevant regional contract or work order, its declared subcontractor, or—where the activity is inside a broader maintenance contract—the road-maintenance contractor |
| Municipal road or city street | The mayor and municipality; a municipal enterprise may act as contracting                                                 | The municipality's dedicated barrier contractor or its general street-maintenance contractor                                                                                                  |

| Situation                                | Manager, owner or public employer                                           | Who may appear on site                                                                                                                                             |
|------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | authority for an assigned function                                          |                                                                                                                                                                    |
| New road, bridge or major rehabilitation | The employer named in the construction contract—often API or a municipality | The main civil-works contractor and any declared specialist supplier or installer; construction and author supervision check the work within their statutory roles |
| Private road or site                     | The private owner                                                           | Its designer and contractor, subject to the applicable construction and product rules                                                                              |

A regional award is therefore not a nationwide licence to install, and a company that wins a lot is not necessarily the company that rolled the steel. The legally named contractor remains responsible to the authority, but consortium members may divide supply, traffic management and installation. A manufacturer may supply without installing; a specialist crew may install as a subcontractor; and the exact arrangement may be visible only in the subcontract, delivery record, site diary and acceptance protocol.

The practical sequence is normally: the road administration inspects and identifies a need; a project or written order defines the site and required system; the contractor organises temporary traffic control, removes damaged parts, supplies and installs the approved assembly; and the administration measures and accepts the work. A published [2026 court decision concerning 60 m of damaged barrier on road II-49](#) documents this chain unusually clearly: the North Central regional contractor received an API request, the repair was later recorded as performed and accepted, and API pursued the vehicle’s liability insurer for the damage.

For a defensible answer to “Who installed the barrier at kilometre X, and when?”, the tender award is only a starting point. The decisive records are the specific work request and the site or acceptance protocol. A company portfolio is evidence of what the company says it did, not the same as the authority’s acceptance record.

## 2015–2025 in numbers: tenders, awards, spending and kilometres

There is no single official Bulgarian dataset that answers all four questions by year. Public procurement records are split between the legacy Public Procurement Register and CAIS EOP; municipalities report separately; and guardrails are often a bill-of-quantities item inside a wider road-construction or maintenance contract. A search only for the guardrail CPV codes would therefore undercount, while charging the full value of every mixed road contract to guardrails would greatly overcount.

The tables below use two deliberately narrow, reproducible series:

- **Procurement:** dedicated or explicitly guardrail-specific API procedures located for the republican road network. A procedure is counted in its publication year, while a contract and its value are

counted in the year it was signed. Municipal examples remain in the separate section below and are not silently mixed into the API count.

- **Execution:** API/MRRB's source-reported annual expenditure for restraint systems on the republican network. This excludes municipal roads and does not capture every barrier embedded in a capital or EU-funded road project. "Awarded" is a net contract value or maximum ceiling; "spent" is cash execution and may be gross where the source reports VAT. The two columns are not additive or directly comparable.

Every euro figure is converted from the original Bulgarian lev at the fixed rate **€1 = BGN 1.95583**. "Not published" means that a defensible annual figure was not located; it does **not** mean zero activity.

### Dedicated API procurement and contractual winners

At least **seven dedicated API procedures** were located for 2015–2025. They produced **14 signed contracts** with an aggregate signed net value or ceiling of **€154,447,558.73 (BGN 302,073,168.80)**. This is a verified API-specific minimum, not a census of all guardrail procurement by Bulgaria's 265 municipalities or of barrier items inside general roadworks.

| Year           | New dedicated API procedures published                                                   | Contracts signed that year | Original signed award/ceiling, excluding VAT | Contractual winners signed that year                                                                                                                                                                                             |
|----------------|------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2015           | <a href="#">1</a>                                                                        | 1                          | €3,681,213.50 (BGN 7,199,827.79)             | Jupiter 05 OOD, for additional systems on AM Maritsa                                                                                                                                                                             |
| 2016           | 0 located                                                                                | 0                          | —                                            | —                                                                                                                                                                                                                                |
| 2017           | 0 located                                                                                | 0                          | —                                            | —                                                                                                                                                                                                                                |
| 2018           | <a href="#">1 procedure; 6 regional lots</a>                                             | <a href="#">4</a>          | €13,702,622.42 (BGN 26,800,000)              | DZZD Patna bezopasnost–Severozapad: EL TE AY AD + KMV Systems; Jupiter 05 OOD for Southeast and South Central; DZZD Patna bezopasnost–Yugozapad: EL TE AY AD + KMV Systems                                                       |
| 2019           | 0 new; two carried lots from 2018                                                        | 2                          | €6,851,311.21 (BGN 13,400,000)               | Northeast: DZZD TRP Iztok—A.D. Hold + Patna bezopasnost; North Central: DZZD Bezopasni patishta–Sever—DLV + Patperfect + Patni stroezhi–Veliko Tarnovo + Siminvest. The <a href="#">two awards</a> completed the 2018 procedure. |
| 2020           | 0 located                                                                                | 0                          | —                                            | —                                                                                                                                                                                                                                |
| 2021           | <a href="#">1 site-specific procedure</a>                                                | 1                          | €421,784.11 (BGN 824,938.01)                 | KMV Systems for Road Safety OOD, road I-1, km 282+485–286+865                                                                                                                                                                    |
| 2022           | <a href="#">2</a> —the six-region programme and a <a href="#">North Central relaunch</a> | 5                          | €108,188,545.53 (BGN 211,598,403)            | DZZD Bezopasnost Zapad—MLG + KMV—for Northwest and Southwest; DZZD OSP-Severoiztok—Bezopasni patishta + A.D. Hold—for Northeast; Jupiter 05 OOD for Southeast and South Central                                                  |
| 2023           | 0 new; contract from the 2022 relaunch                                                   | 1                          | €21,602,081.98 (BGN 42,250,000)              | DZZD OSP-Sever—DLV + Radina + Siminvest—for North Central                                                                                                                                                                        |
| 2024           | <a href="#">1 two-region procedure</a>                                                   | 0                          | €0—no award                                  | None; the procedure later ended without an award                                                                                                                                                                                 |
| 2025           | <a href="#">1 six-region procedure</a>                                                   | 0                          | €0—no contract                               | None; the €490,840,205.95 (BGN 960 million) forecast was not an award and the procedure was terminated in June 2026                                                                                                              |
| Verified total | 7                                                                                        | 14                         | €154,447,558.73 (BGN 302,073,168.80)         | —                                                                                                                                                                                                                                |

The original-award total deliberately excludes later amendments. CAIS EOP records show that addenda increased the existing 2022–2023 six-region programme by **€21,602,081.98 (BGN 42,250,000)** in 2023, **€23,762,290.18 (BGN 46,475,000)** in 2024 and **€31,104,302.80 (BGN 60,834,728.54)** in 2025. Those additions raised that programme’s aggregate net ceiling from **€129,790,627.51 (BGN 253,848,403)** to **€206,259,302.46 (BGN 403,408,131.54)**. They are contractual capacity—not new tenders, guaranteed expenditure or proof of installed kilometres.

The recurrence is more informative than a simple list of names. Jupiter 05 won the 2015 API contract, four regional contracts across the 2018 and 2022 rounds, and the Sofia and Plovdiv municipal work discussed below. KMV appears as the direct 2021 contractor and as a consortium member in the Northwest and Southwest in both 2018 and 2022. A.D. Hold recurs in the Northeast, while DLV and Siminvest recur in the North Central region with changing partners. These are contractual roles: consortium shares, product suppliers, subcontractors and the crews that installed each metre require the underlying contract and site records.

### Money spent and physical output

The most defensible expenditure series is API/MRRB current-maintenance reporting for the republican road network. On the source-reported basis, the verified 2017–2025 sum is **€340,171,977.27 (BGN 665,318,558.30)**. No separate annual amount could be established for 2015 or 2016; API disclosed only that the combined 2015–2017 figure exceeded **€11,248,421.39 (BGN 22 million)**.

| Year                                 | API/MRRB reported expenditure                             | Published guardrail length for that year                                      | What the physical figure actually means                                                                                                  |
|--------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| 2015                                 | Not separately published                                  | National total not published; <u>81.809 km specified</u>                      | Contract quantity for the AM Maritsa procedure, <b>not</b> a located final acceptance total                                              |
| 2016                                 | Not separately published                                  | National total not published                                                  | The <u>annual report</u> names one continuing AM Trakia project over a 7.775-km road section; that is not national installed rail length |
| 2017                                 | <u>€5,725,218.96 (BGN 11,197,555, including VAT)</u>      | Not published                                                                 | The same source's 497 km is the stock of motorway sections equipped by then, not installation during 2017                                |
| 2018                                 | <u>€9,989,362.06 (BGN 19,537,494)</u>                     | <b>217 km replaced</b>                                                        | National API operational output                                                                                                          |
| 2019                                 | <u>€14,027,322.42 (BGN 27,435,058)</u>                    | <b>305 km replaced</b>                                                        | National API operational output                                                                                                          |
| 2020                                 | <u>€35,286,809.18 (BGN 69,015,000)</u>                    | <u><b>1,421 km described as new</b></u>                                       | National API operational output; the money discrepancy explained below prevents a credible cost-per-kilometre calculation                |
| 2021                                 | <u>€24,721,042.42 (BGN 48,350,156.39)</u>                 | National total not published; <u><b>7.120 km completed</b></u> in one project | Main barrier length on road I-1, plus 67.5 m of terminal/end elements; the completion notice says full volume was performed              |
| 2022                                 | <u>€57,381,918.64 (BGN 112,229,277.94)</u>                | Not published                                                                 | Cash paid in 2022 may include earlier certified obligations and need not equal installations made that calendar year                     |
| 2023                                 | <u>€69,090,613.81 (BGN 135,129,495.21, including VAT)</u> | Not published                                                                 | Money only                                                                                                                               |
| 2024                                 | <u>€59,877,162.79 (BGN 117,109,551.30, including VAT)</u> | Actual not published                                                          | The <u>2,000-km figure was a target</u> , not an output; the year-end status was "partially completed" without an actual length          |
| 2025                                 | <u>€64,072,526.99 (BGN 125,314,970.46, including VAT)</u> | Not published                                                                 | Money only; the 2025 action plan no longer gave a numerical guardrail target                                                             |
| <b>2017–2025 source-reported sum</b> | <b>€340,171,977.27 (BGN 665,318,558.30)</b>               | <b>No valid 11-year sum</b>                                                   | <b>Annual national output is published only for 2018–2020</b>                                                                            |

The 2020 documents contain a material, unresolved discrepancy. MRRB’s year-end budget execution gives **€35.29 million (BGN 69.015 million)**, which is the cash figure used in the sum above. API’s separate operational release says **€65.39 million (BGN 127.89 million)** was “invested” for the same reported 1,421 km. Neither source reconciles scope, timing or VAT treatment. Presenting one as a correction of the other—or dividing either amount by 1,421 km to derive a unit price—would go beyond the evidence.

The physical-data gap is itself a journalistic finding. National annual output is available for only **three of the eleven years**: 217 km replaced in 2018, 305 km replaced in 2019 and 1,421 km described as new in 2020. The 81.809 km in 2015 is a tender quantity, while the 7.120 km in 2021 is one completed site-specific project, not a national total. Prices cannot fill the missing years because a payment can combine new installation, replacement after crashes, removal and storage, terminals, transitions, crash cushions, transport and traffic management, across systems with different containment classes and steel content.

A publishable full national series would therefore require an access-to-information request to API and its 27 regional administrations for the accepted metres and paid invoices by calendar year, separating new installation, replacement and crash repair, and identifying the contract, road, kilometre, side, contractor, subcontractor and manufacturer. Nationwide municipal coverage would require the same data from all 265 municipalities or an explicitly declared sample.

## Public tenders: who issued them and who won?

The record below maps the major dedicated national procurements and illustrative municipal and project contracts. It is not an inventory of every barrier item embedded in a general road-construction or maintenance contract.

### The last completed national programme: API’s 2022 regional contracts

API opened procurement **00044-2022-0028** in April 2022 for restoration, repair, supply, installation, removal and storage of road-restraint systems, together with temporary traffic organisation, in six regions. The [Ministry of Regional Development’s announcement](#) put the three-year indicative value at **€129,790,627.51 (BGN 253,848,403 excluding VAT)**. The work was priced by units and assigned quantities, so the forecast is not proof that the entire amount was spent.

The [electronic procurement file](#) and API’s [published contract register](#) identify the following contractual winners and terms:

| Region                                              | Contractual winner                                                          | Signed      | Nominal operating period |
|-----------------------------------------------------|-----------------------------------------------------------------------------|-------------|--------------------------|
| Northwest—Vidin, Vratsa, Montana, Lovech and Pleven | DZZD <b>Bezopasnost Zapad</b> : MLG EOOD + KMOV Systems for Road Safety OOD | 30 Sep 2022 | 5 Oct 2022–4 Oct 2025    |

| Region                                                            | Contractual winner                                                         | Signed      | Nominal operating period |
|-------------------------------------------------------------------|----------------------------------------------------------------------------|-------------|--------------------------|
| North Central—Veliko Tarnovo, Gabrovo, Razgrad, Ruse and Silistra | DZZD <b>OSP-Sever</b> : DLV EOOD + Radina EOOD + Siminvest OOD             | 28 Apr 2023 | 3 May 2023–2 May 2026    |
| Northeast—Varna, Dobrich, Shumen and Targovishte                  | DZZD <b>OSP-Severoiztok</b> : Bezopasni patishta EOOD + A.D. Hold OOD      | 29 Sep 2022 | 30 Sep 2022–29 Sep 2025  |
| Southeast—Burgas, Sliven, Stara Zagora and Yambol                 | <b>Jupiter 05 OOD</b>                                                      | 27 Sep 2022 | 28 Sep 2022–27 Sep 2025  |
| South Central—Kardzhali, Pazardzhik, Plovdiv, Smolyan and Haskovo | <b>Jupiter 05 OOD</b>                                                      | 27 Sep 2022 | 28 Sep 2022–27 Sep 2025  |
| Southwest—Blagoevgrad, Kyustendil, Pernik and Sofia Province      | DZZD <b>Bezopasnost Zapad</b> : MLG EOOD + KMV Systems for Road Safety OOD | 30 Sep 2022 | 5 Oct 2022–4 Oct 2025    |

The initially selected bidder for the original North Central lot withdrew and that lot was terminated; the [follow-up competition](#) produced the April 2023 contract with the three-member OSP-Sever consortium shown above. API's register gives the performance period as 3 May 2023–2 May 2026, while the electronic procurement file displays 28 April 2023–27 April 2026; either recorded end date had passed by this review. All six contracts had therefore reached their stated end dates by 6 August 2026. They remain useful for identifying the last confirmed regional counterparties, but not for naming a current 2026 installer.

## Municipalities issue their own contracts

API is not the buyer for every guardrail in Bulgaria. Sofia Municipality's [2022 passive-safety procurement](#) was awarded to Jupiter 05 for **€1,704,306.26 (BGN 3,333,333.32 excluding VAT)**, covering barriers, motorcycle protection, terminals and crash cushions; the contract was signed on 21 December 2022 and, after an amendment, ran to 22 December 2025. In Plovdiv, the municipal enterprise responsible for transport organisation awarded the guardrail lot in a broader markings-and-signalling procedure to Jupiter 05 on 9 December 2022 for **€195,995.22 (BGN 383,333.33 excluding VAT)**, through 9 December 2024. The city's follow-up contract, [00267-2024-0049](#), was signed with Jupiter 05 on **27 November 2024** for the same net ceiling and a 730-day term, so it was nominally still within term at the review date, absent a later termination or amendment. The official-procurement-data [company and contract record](#) lists all three awards.

Two smaller 2022 records broaden the player list. [Pernik Municipality](#) contracted **Siminvest OOD** for a net ceiling of **€25,564.59 (BGN 50,000)**; its completion notice records **€25,490.11 (BGN 49,854.32)** paid but no length. [Pomorie Municipality](#) contracted **Transstroy Eco OOD** for 96 m of N2W4 barrier,

completed for **€9,613.11 (BGN 18,801.60 excluding VAT)**. These examples are not added to the API annual table because they do not constitute a complete municipal census.

Guardrails can also sit inside a much larger road-building contract, where the public record names the general contractor rather than a specialist installer. For example, API's [23 June 2026 start notice for two road-rehabilitation packages in Dobrich Province](#) includes new restraint systems and names the two prime consortia and their supervisors, but not a guardrail subcontractor. It would be an inference—not a fact—to attribute the barrier fabrication or installation to any particular specialist without the project's subcontract and acceptance records.

### **What happened to the planned 2025–2026 replacement contracts?**

The current position requires a timeline because a selection decision is not the same as a signed contract:

| Date               | Event                                                                                                                                                                                                                                                                                                                                         | What it means                                                                                                                                                                                                                                    |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30 May 2025        | An earlier two-region API procedure, <a href="#">00044-2024-0096</a> , ended without an award.                                                                                                                                                                                                                                                | It did not create a new South Central or Southwest contractor.                                                                                                                                                                                   |
| 23 Sep 2025        | API launched <a href="#">procedure 00044-2025-0125</a> for all six regions, with a <b>€490,840,205.95 (BGN 960 million excluding-VAT)</b> forecast and a 60-month term.                                                                                                                                                                       | The figure was the five-year forecast for six lots, not a paid amount.                                                                                                                                                                           |
| 24 Oct 2025        | API reported <a href="#">17 offers</a> .                                                                                                                                                                                                                                                                                                      | Bidding was still under evaluation.                                                                                                                                                                                                              |
| 10 and 18 Feb 2026 | Selection decisions initially named DZZD <b>Zapad</b> —Politrade Construction + KMV—for Northwest and Southwest; DZZD <b>Sever</b> —Radina + Shalin + KMV—for North Central; and union <b>IRV OSP</b> —Jupiter 05 AD + Aquaconstruction—for Southeast and South Central. The Northeast lot was terminated after all three bids were rejected. | These were selected bidders, not yet contractors. The <a href="#">official procedure file</a> and readable copies of the <a href="#">first decision</a> and <a href="#">second decision</a> show the selections. No regional contracts followed. |
| 30 Jun 2026        | API terminated the national procedure while complaints were pending.                                                                                                                                                                                                                                                                          | The formal result is <b>no winner for any of the six lots</b> . The February names must not be described as current installers.                                                                                                                  |
| 1–27 Jul 2026      | API said future supply and installation would be folded into forthcoming current-maintenance contracts and announced its intention to make an interim in-house assignment to state-owned <b>Avtomagistrali EAD</b> .                                                                                                                          | By late July, API still described that assignment as forthcoming after an administrative process—not as a publicly verified, mobilised contract.                                                                                                 |

This creates a counterintuitive but important answer to “Who won the latest national tender?”: **nobody obtained a contract from it**. In its [1 July termination announcement](#), API said it was changing the procurement model so that guardrail supply and installation would form part of future current-maintenance contracts. The agency also said that the absence of supply-and-replacement contracts prevented it from assigning the work. On 27 July, API told [Bulgarian National Television](#) that OPU teams were still inspecting the barriers and that the Avtomagistrali assignment *was to be made* after the administrative procedure.

Accordingly, the verified position at **6 August 2026** is:

- API and the regional road administrations remain responsible for inspecting and identifying needs on the republican network;
- the six dedicated 2022–2023 regional contracts have expired;
- the 2025 national competition ended with no contract winners;
- API announced Avtomagistrali as the intended interim in-house performer, but the reviewed public material did not establish a signed, active assignment or name its product suppliers and site crews; and
- municipal and project-specific contracts may still be active independently, as the Plovdiv example shows.

## After a crash, does Bulgaria inspect the guardrail?

**The short answer is: the crash scene must be documented when somebody is killed or injured, but a separate engineering audit of the guardrail is not automatically mandatory after every serious or fatal crash.** Bulgaria has several different kinds of “inspection,” and public statements often blur them.

Under Articles 125 and 125a of the current [Road Traffic Act](#), Traffic Police must attend a crash in which someone is killed or injured and issue a visit protocol. The [crash-documentation ordinance](#) requires an injury-crash protocol and detailed plan, and [police instructions](#) require officers to identify and document damage to the road and its accessories. This establishes what officers observed at the scene. The standard form does not require them to compare the barrier with its approved design, Declaration of Performance, CE documentation, manufacturer’s installation manual or EN 1317 test configuration.

The distinction can be stated simply:

| Procedure                                        | When it happens                                                                                                                              | What it can establish                                                                                                                             | Does it automatically prove EN 1317/as-installed conformity?                                                                                                                                                                               |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Police attendance and crash protocol             | Mandatory when anyone is killed or injured                                                                                                   | Positions, visible damage, scene circumstances, a plan and photographs                                                                            | <b>No.</b> It is evidence preservation and crash documentation, not a complete barrier audit.                                                                                                                                              |
| Criminal scene inspection and expert examination | The scene is examined when relevant to a criminal investigation; an engineer or technical expert is used when necessary                      | Impact evidence, vehicle dynamics, road condition and—if specifically assigned—barrier design, installation and causal performance                | <b>Not automatically.</b> The <a href="#">Criminal Procedure Code</a> makes expertise mandatory for cause of death and the nature of injury, not specifically for guardrail compliance.                                                    |
| Periodic road-safety inspection                  | On a class-based schedule under the <a href="#">2022 infrastructure-safety procedures</a>                                                    | Visible defects such as damage, dangerous corrosion, unsafe ends and transitions, insufficient length or apparent non-compliance with BDS EN 1317 | <b>No, not by itself.</b> It is principally a visual network-management inspection; the regulation's main scope and extension rules also matter.                                                                                           |
| Targeted road-safety inspection                  | Following network-assessment findings or the road manager's decision; crash data, police notices and public signals inform annual priorities | An expert site examination and report on dangerous conditions, defects and corrective measures                                                    | <b>Potentially, if the project and product evidence are examined.</b> One fatal crash is not an automatic statutory trigger.                                                                                                               |
| <a href="#">DABDP compliance inspection</a>      | Planned or ordered at the agency chair's discretion, including after a signal; serious crashes are a selection criterion                     | Site and document review, findings, recommendations, deadlines and later follow-up                                                                | <b>Potentially.</b> It is the most direct independent administrative route in the reviewed framework, but it must actually be selected and ordered.                                                                                        |
| Repair after impact                              | When the restraint system is damaged                                                                                                         | Restoration of the safety function                                                                                                                | <b>No retrospective finding.</b> Article 1(5) of the <a href="#">2024 restraint-system ordinance</a> says a damaged system must be restored according to the approved project; that duty does not itself determine why the crash happened. |

Once a targeted inspection is ordered, a site visit, visual examination and report are mandatory. For roads within the 2022 regulation's scope—or brought into it under its extension rules—periodic inspections also operate on set intervals: the regulation specifies daytime checks monthly on motorways and expressways, every three months on class I and II roads, and every six months on class III and municipal roads, with separate night intervals. Those records can show whether damage or a defect was known before a crash. They are not equivalent to dismantling the system, measuring every component or reconstructing the collision.

There is one further limited procedure that can mislead readers. Article 170b of the Road Traffic Act and [Ordinance N-12 of 2019](#) provide an annual official analysis of serious crashes caused by novice drivers and by drivers performing public transport or own-account carriage of passengers or freight. It includes road and pavement data, but it is aggregate and largely driver-focused; it is not a site-by-site EN 1317 investigation of every serious crash.

On 29 June 2026, the Interior Ministry [announced](#) that prepared instructions *would* add examination of the road servitude—including guardrails, asphalt, dangerous billboards and vegetation—to the summary pre-trial crash protocol. The announcement supplied no signed instruction, registration number, effective date or checklist and said it “will be sent” to the relevant units. As of the research cut-off, the announcement alone was not proof that a new universal engineering-inspection rule had entered into force.

### What did actual Bulgarian crash investigations find?

The public record contains real investigations, but their status differs sharply. An expert was *appointed* is not the same as an expert report was *published*; a prosecutor's evidentiary conclusion is not a final judgment; and a road manager's press statement is not an independent assessment.

| Crash                                                                       | What was examined                                                                                                                                                                                                                                                                                              | Public guardrail finding                                                                                                                                                                                                                                                                                                                                                                                                                 | Evidentiary status at 6 August 2026                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Svoje bus crash, road II-16, 25 August 2018; 20 deaths</b>               | Prosecutors reported supplementary scene inspections and samples from the barrier. A Bulgarian Academy of Sciences technical examination was assigned to test material, thickness, fastening and compliance, alongside road-engineering examinations.                                                          | The prosecution's <a href="#">published conclusion</a> was that the road and barrier did not meet the applicable standards; traffic intensity required a higher-containment steel system, the project did not provide the required elastic barrier, and the installed barrier could not retain a bus. The earlier <a href="#">sampling order</a> did not publish the underlying component measurements.                                  | <b>Detailed expert work; prosecutorial finding; not a final court finding.</b> In a <a href="#">February 2025 status update</a> , the prosecution said the first-instance trial still had many witnesses and 25 experts to hear. No final judgment was located by the cut-off.                                         |
| <b>AM Struma/Bosnek bus crash, 23 November 2021; 45 deaths</b>              | An MRRB group examined pavement, markings, signs and restraint systems; later civil-court evidence included site and technical examinations.                                                                                                                                                                   | MRRB's <a href="#">30 November 2021 report</a> said the barrier complied with the rules applicable when installed in 2007, while calling the old fish-tail end treatment dangerous. A <a href="#">7 January 2025 first-instance civil judgment</a> found that barrier parts detached and entered the bus, criticised containment selection, corroded reflectors and the absence of a crash cushion, and assigned API 10% responsibility. | <b>Conflicting, question-dependent findings.</b> This is a first-instance decision; <a href="#">API announced an appeal</a> , and no later appellate ruling was located by the cut-off. The judgment also contains an internal N2/N1 class-label inconsistency, which should not be silently "corrected" in reporting. |
| <b>AM Struma at Malo Buchino, truck crossover, 25 June 2026</b>             | The Sofia District Prosecutor ordered another scene inspection of the barrier's fixing and deformation; demanded the project, commissioning and repair files, inspection protocols, certificates and Declarations of Performance; and appointed combined automotive, transport and road-engineering expertise. | The <a href="#">official order</a> asks exactly the right questions: impact speed, load and angle; whether the installed system met the site requirements; and whether a properly selected and installed barrier could have contained or redirected the truck.                                                                                                                                                                           | <b>A strong investigation design, but no published result.</b> The examination was pending; crossing the median is not itself proof of non-compliance.                                                                                                                                                                 |
| <b>AM Trakia near Zimnitsa, truck crossover, 24 June 2026; three deaths</b> | The Yambol prosecutor ordered three automotive examinations and a separate expert review of whether the barriers met standards and when and how they were installed.                                                                                                                                           | The <a href="#">prosecutor's announcement</a> gives the assignment but not an answer. The <a href="#">government also announced</a> a broader inspection beginning with the crash site and newly manufactured barriers.                                                                                                                                                                                                                  | <b>Pending.</b> No public expert result or broader inspection report was found by the cut-off.                                                                                                                                                                                                                         |
| <b>AM Maritsa near Harmanli, 26 July 2026; three deaths</b>                 | Police were investigating the crash. API said the regional administrations regularly inspect motorway barriers visually; no crash-specific road-engineering report was published.                                                                                                                              | API told <a href="#">Bulgarian National Television</a> that the barriers were in good condition apart from crash damage and met requirements applicable when the motorway was built. It also acknowledged that the lack of active replacement contracts prevented assignment of repairs.                                                                                                                                                 | <b>Asset-owner statement, not an independent forensic finding.</b> It does not prove that the exact installed assembly matched its tested configuration or explain its performance in this collision.                                                                                                                  |

The Svoge investigation is therefore the clearest public example of a barrier being sampled and technically examined after a catastrophe. Bosnek shows why the exact question matters: “Did this comply with the rules in 2007?” and “Was this road acceptably safe for this hazard in 2021?” can produce different answers. The 2026 Malo Buchino and Zimnitsa files show a stronger contemporary approach, but their expert questions must not be reported as findings before answers are published.

### **Are there objective national studies?**

Yes, although this review found no public, barrier-by-barrier compliance census for the whole country.

| Research or review                                                                     | What it found                                                                                                                                                                                                                                                                                                                                                                                                                                                             | What it does not prove                                                                                                                                              |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">DABDP's 2019 annual road-safety report</a>                                 | It reproduced inventory data classifying 28.8% of about 6.89 million metres of republican-road restraint systems as unsatisfactory, using the applicable rules, API's 2014 technical specification and internal documents. It also described as common the absence of systems or non-compliance with API's technical rules and BDS EN 1317, and criticised inspections that inventoried defects without objectively assessing important systems.                          | The inventory is a 2019 condition snapshot, not a product-by-product EN 1317 audit or the current status of every kilometre and later repair.                       |
| <a href="#">RADAR/iRAP pilot assessment, 2020</a>                                      | On roughly 234 carriageway-kilometres of selected higher-risk Bulgarian road sections, no section achieved five stars; 73% was rated one or two stars. Missing run-off-road protection, hazardous roadside objects and weak head-on protection were among the risks; barriers were among the proposed countermeasures.                                                                                                                                                    | It is a risk-rating sample, not a laboratory or documentary conformity audit of each barrier product. It cannot be extrapolated mechanically to the entire network. |
| <a href="#">First comprehensive national infrastructure assessment, published 2025</a> | DABDP assessed about 6,900 km outside settlements: all motorways and class-I roads, but samples covering 50% of class-II and 29% of class-III roads. Across all infrastructure factors—not guardrails alone—43.19% of the reviewed length was rated unsatisfactory or poor. It found inconsistent use of targeted inspections and audits, weak measurable maintenance criteria and long delays in restoring incident-damaged signs and barriers, leaving roads unsecured. | The 43.19% figure is <b>not</b> a percentage of non-compliant guardrails or a full-network census of every lower-class road.                                        |
| <a href="#">DABDP inspection of road II-86, 12 March 2026</a>                          | After reviewing crash data, site conditions and project records, inspectors found the predominantly H1W4 systems installed in 2021–2022 were in the required locations and met the rules then applicable. They nevertheless recommended a full safety-zone analysis and a separate restraint-system project under the 2024 ordinance.                                                                                                                                     | A positive finding for one inspected section does not establish national compliance or prove how the system would behave in an impact outside its test conditions.  |

The [National Audit Office's 2026 road-safety audit](#) reinforces the information problem: it found that MVR did not perform sufficiently deep causal analysis and lacked a real analysis of infrastructure problems. That is evidence of a systemic data gap, not evidence that infrastructure caused every crash.

### So, are Bulgaria's guardrails "according to standards"?

**The reviewed evidence supports neither a blanket "yes" nor a blanket "no."** Official records demonstrate all three of the following:

- some Bulgarian road sections have lacked barriers or had systems officially described as non-compliant;
- some specifically examined systems have been found compliant with the rules applicable when they were installed; and
- many crash files do not publish enough product, project and installation evidence to answer the question at all.

Age complicates the answer. The 2024 ordinance requires new and relevant replacement works to use the BDS EN 1317 and construction-product route. Section 4 permits existing systems meeting API's 2010 Technical Rules to be replaced during major repair or restoration after damage. Section 5 requires broader safety-zone programmes—up to ten years for republican roads and fifteen for municipal roads and settlements—to remove, relocate, modify or shield hazards, and expressly includes replacement of existing systems that do not meet the ordinance. A statement that a barrier complied "when the road was built" is therefore meaningful, but it is not identical to proof that it meets every current 2024 design requirement.

Nor does a bent, broken or penetrated barrier prove illegality. EN 1317 classifies performance in defined crash tests using specified vehicle masses, speeds and impact angles. A real truck may be heavier, faster, more sharply angled or differently loaded than the test envelope. Conversely, an intact-looking rail can still have the wrong posts, spacing, bolts, terminal, transition, anchorage or working space.

For a specific crash location, a defensible conformity finding needs five evidence layers:

- **Design and selection:** the approved restraint-system project, identified hazard, required containment and working width, exact length, terminal and transition details.
- **Product identity:** the precise system designation, Declaration of Performance, CE/conformity certificate where applicable, drawings and manufacturer's manual—not a generic catalogue or ISO 9001 certificate.
- **As-installed evidence:** as-built drawings, delivery records, installation and supervision logs, acceptance acts, measurements of rail height, posts, spacing, anchors, fasteners, foundation, length and clear deformation space.

- **Condition and maintenance:** the last periodic and targeted inspection reports, previous-impact records, repair orders, replaced quantities and acceptance protocols.
- **Crash reconstruction:** vehicle mass and load, speed, angle, trajectory, contact sequence, soil and shoulder condition, system deformation and whether the collision was within the declared test envelope.

The absence of a published engineering report establishes only a public-evidence gap; it does not prove that no examination occurred. For journalists, the most useful access-to-information request is therefore not “Was an inspection made?” but “Which inspection, by whom, under which order, using which documents, and where is the report?” For the exact kilometre and direction, request the police protocol and photographs; criminal scene protocol and expert-appointment orders; the experts’ completed reports; DABDP/API inspection reports; the approved and as-built barrier project; Declaration of Performance and installation manual; acceptance records; and pre- and post-crash maintenance logs. If an authority cites confidentiality in an active case, ask at minimum for the existence, date, scope and procedural status of each examination.

## What a sound installation should demonstrate

From a distance, two barriers may look identical. Their documentation and details reveal whether they are equivalent. A competent acceptance or inspection should be able to verify:

- the approved project and required performance classes;
- the exact product, Declaration of Performance and applicable conformity documents;
- correspondence with the tested rail, posts, spacers, bolts, foundations and installation manual;
- correct line, height, post spacing, splice direction and fastener installation;
- sufficient effective length and a clear working-width and vehicle-intrusion envelope;
- appropriate terminals, transitions and bridge-joint details;
- sound galvanising and properly repaired local coating damage; and
- inspection and repair after an impact, including hidden posts, anchors and connections.

A rusty scratch, by itself, does not prove that the barrier is illegal. A shiny new rail, by itself, does not prove that it is safe. The decisive question is whether the complete installed system matches the declared and project-specified performance.

## The real standard is performance

The humble *mantinela* is a useful lesson in modern road safety. Its corrugations, steel thickness and posts matter, but none has an independent magic value. Safety comes from a system that has been

tested as a system, selected for a real hazard, installed with enough space and length, and maintained after the next collision.

That is also why a barrier should bend. Its task is not to win a contest of strength against a vehicle. Its task is to make the outcome of a human mistake less severe.

## Editorial research note

This article reflects the position checked on **6 August 2026**. It is an explanatory overview, not a substitute for a licensed standard, an approved road project or product-specific installation instructions. EN and BDS standards are copyrighted; technical design should use the current official editions.

## Principal sources

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- [Centralised Electronic Public Procurement System—2025 six-region procedure and final result](#)
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- [DABDP—2025 comprehensive infrastructure assessment](#)
- [DABDP—12 March 2026 inspection report for road II-86](#)
- [Bulgarian Prosecutor’s Office—published Svoge investigation findings](#)
- [MRRB—official Bosnek road-infrastructure review](#)
- [Sofia District Prosecutor—Malo Buchino investigation scope](#)
- [Bulgarian National Audit Office—2026 audit of MVR road-safety control](#)

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The report does not constitute a technical inspection, forensic expertise, legal opinion, audit, certification assessment or determination of liability. It cannot establish whether a specific road restraint system, installation, company or contract complies with applicable standards without examination of the exact site, approved design, Declaration of Performance, installation records, maintenance history and, where relevant, expert testing.

References to companies, public authorities, contracts, tenders, crash investigations or published findings are descriptive and evidence-based. A tender winner, supplier or manufacturer is not necessarily the entity that physically installed, maintained or designed a particular barrier system. No inference of wrongdoing, liability or non-compliance should be drawn beyond what is expressly supported by the cited public record.

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