

## Technology Offer

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# Road passive safety: building blocks with an integrated deformation zone for separate access bridges

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### Summary

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*Czech university researchers dealing with traffic engineering have developed building elements that could be incorporated into separate access bridges leading across road ditches. In the case of a vehicle collision into such a bridge, they can help to reduce hardness of a collision, thus reducing the consequences of the road accident for the passengers and vehicles. The scientists are looking for companies interested in a license agreement. The licensing agreement is sought.*

<b>Creation Date</b>	22 September 2015
<b>Last Update</b>	30 September 2015
<b>Expiration Date</b>	28 September 2016
<b>Reference</b>	TOCZ20150922003

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### Details

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#### Description

The problem:

Road accident consequences are influenced by many factors. Destruction effect on passengers in case of road traffic accidents were decreased using deformation zones optimization and restraint systems application. There are still significant reserves in solid barriers aggressiveness reduction. Their danger can be demonstrated by stiffness and firmness of the solid barriers, which effect impact hardness.

Solid barriers can be represented by the separate access bridges ("slip roads") leading across the road ditches. The separate access bridge near the driving lane does not have to be visible at first sight and therefore the driver under the sheering manoeuvre does not count with the option to hit this artificial obstacle. Vehicles that ditched the road are literally led by the ditch basins and directed towards the unprotected separate access bridges. That is the reason why such solid obstacles are dangerous for drivers.

The solution offered:

Czech university researchers dealing with traffic engineering have developed building elements (deformation blocks) that could be incorporated into a separate access bridges leading across the road ditches. In the case of a vehicle collision into such bridge they can help to reduce hardness (aggression) of a collision, thus reducing the consequences of the road accident for the passengers and vehicles.

The solution offered is based on a separate access bridge that is assembled from parts with different stiffness in horizontal and vertical direction. Such solution enables programmable deformation of the vehicle impact force and at the same time ensuring a required load capacity in the vertical direction

for vehicles passing over a separate access bridge. Please see the picture at the end of the text.

The competing solutions:

The solution overcomes the drawbacks of current solutions by softening the potential impact zone and thus reducing the vehicle impact force, which determines the degree of overload applied to the crew and the degree of deformation applied to the vehicle. The separate access bridge as offered consists of basic shapes and at least from one deformation element. There is a hole for the flow of water through a separate access bridge in the head of the deformation element.

Currently existing separate access bridges are designed only as vertical or inclined deformable heads connected with a pipe of a given diameter. The heads of current access bridges are not protected against vehicle impact. Usage of dampers is known but not used in this context.

There are no known competing solutions solving the same problem: vehicle crashing into a separate access bridge. The issue of reducing the effects of traffic accidents has been primarily solved by optimizing the vehicle deformation zones and by designing vehicles restraint systems.

The partner sought:

The scientists are looking for companies interested in license agreement. The subject of the license would be know-how related to the design of deformation block internal structure for separate access bridges, which is the subject of a patent application.

The partner sought should also have capacity for fine-tuning the production process of the building elements (deformation blocks) and capacity for bringing the technology to the final product and commercialize it.

The partner sought should have an experience with fine-grained concrete mix preparation and precast concrete as well.

The licensing agreement is sought.

### **Advantages and Innovations**

The solution offered increases passive safety of roads. If the driver crashes, instead of hitting the solid barrier, the driver hits the programmed deformation zone, which is part of the separate access bridges leading across the road ditches. Therefore, likelihood of injury to passengers or other road users as well damage to the vehicle is reduced.

The main benefit for manufacturer sought is availability to offer building owners a safer separate access bridge leading across the road ditches, thus offering reduced risk associated with the consequences of an impact to the obstacles in the case of an accident.

The building elements (deformation blocks) are easy to install and replicable if necessary after an accident. Their assembly is a dry process based on prefabricated parts. The access bridge can be installed within one working day.

### **Stage of Development**

Under development/lab tested

### **Comments Regarding Stage of Development**

Proof-of-concept stage has been successfully finished and functional sample has been successfully tested.

### **IPR Status**

Patent(s) applied for but not yet granted

### **Comment Regarding IPR status**

European Patent application has been filed.

## Profile Origin

National R&D programme

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## Keywords

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### Technology

02007002	Building materials
02008005	Road Transport
02008006	Traffic Engineering / Control Systems
02010001	Planning and security
02010002	Engineering

### Market

09001005	Motor vehicles, transportation equipment and parts
09001007	Other transportation
09007001	Construction companies
09007002	Manufacture of construction materials, components and systems
09007004	Engineering and consulting services related to construction

### NACE

F.42	Civil engineering
F.42.1	Construction of roads and railways
M.71.1	Architectural and engineering activities and related technical consultancy

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## Client

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### Type and Size of Organisation Behind the Profile

University

### Year Established

1707

### Turnover

10 - 20M

### Already Engaged in Trans-National Cooperation

Yes

### Languages Spoken

English  
Slovak

Czech

**Client Country**

Czech Republic

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## Partner Sought

### Type and Role of Partner Sought

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The partner sought should also have capacity for fine-tuning the production process of the building elements (deformation blocks) and capacity for bringing the technology to the final product and commercialize it.

The partner sought should have an experience with fine-grained concrete mix preparation and precast concrete as well. The licensing agreement is sought.

### Type and Size of Partner Sought

SME 11-50, SME <10, >500 MNE, 251-500, SME 51-250, >500

### Type of Partnership Considered

License agreement