# TRAFFIC CALMING

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*Summary: The paper deals with the traffic calming in the urban space. Traffic calming shares the goal of reducing vehicle speeds, improving safety, and enhancing quality of life. Traffic calming starts to occur in many Czech towns. There is given account to traffic calming in Trnovska Street in Pardubice.*

*Key words: traffic calming, traffic circle, urban planning*

## 1. TRAFFIC CALMING

Traffic calming shares the goal of reducing vehicle speeds, improving safety, and enhancing quality of life. It has two main objectives (2):

1. the reduction of personal injury accidents,
2. improvement in the local environment for people living, working or visiting area.

European traffic calming began as a grassroots movement in the late 1960s. The residents of the Dutch City of Delft fought cut-through traffic by turning their streets into "living yards." This was followed by the development of European slow streets (designed for 30 kph) in the late 1970s. The application of traffic calming principles to intercity highways through small Danish and German towns in the 1980s; and the treatment of urban arterials in area wide schemes, principally in Germany and France, also in the 1980s (1).

Traffic calming uses an expanded repertoire of measures and techniques to change driver's perception of an area. They have to coerce and mould driver behaviour to improved levels of safety. Some of the drivers drive a higher than advised speed in the urban area. There is a direct correlation between accident severity and vehicle speed. Excessive speed is the prime cause of same accident. The Transport Research Laboratory has identified that 3 – 7% reductions in accidents can be expected for every 1 kilometre/hour reduction in vehicle speeds in urban areas (2).

Traffic calming starts to occur in many Czech towns. There are many streets which impress to be only vehicular traffic routes and their some other uses are lesser importance. Traffic calming can alter the balance and have an effect that the streets is primarily for shopping or residential use and the vehicular traffic is of secondary importance. It is targeted to the driving speed optimization and the safety area making for no motorized users of the streets - the pedestrians and the bikers.

There are two groups of traffic calming measures:

- the speed control measures are primarily used to address speeding problems – e.g.: speed humps, traffic circles, neckdowns, speed tables, roundabouts, center island

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narrowings, raised crosswalks, chokers, raised intersections, realigned intersections, textured pavements;

- the volume control measures are primarily used to address cut-through traffic problems – e.g.: full closures, half closures, diagonal diverters, lateral shift, median barriers.

Sometime it is possible combined more traffic calming measures – e.g.: speed hump with choker, raised crosswalks with choker etc.

There are some technical manuals for traffic calming in Czech Republic - e.g.:

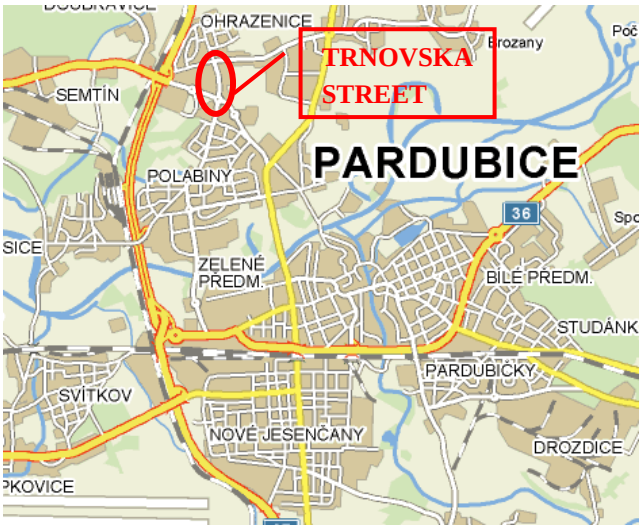
- TP 145 – Traffic calming rules,
- TP 103 – The home zone and pedestrian zone designing,
- TP 179 – The bikeway designing,
- TP 135 – The traffic circles design,
- ČSN 736110 – The village road design,
- ČSN 73 6102 - The cross-roads design.

## 2. TRAFFIC CALMING ON TRNOVSKA STREET

### 2.1. Trnovska Street before the reconstruction

The reconstruction Trnovska street is one of the effectual project of traffic calming in Pardubice. The cross-road (Trnovska – Pohranovska – Hradistka) reconstruction is top-rated by many traffic engineers.

Trnovska Street is in the north part of Pardubice which is calling Ohrazenice (Figure 1).




Source: Author

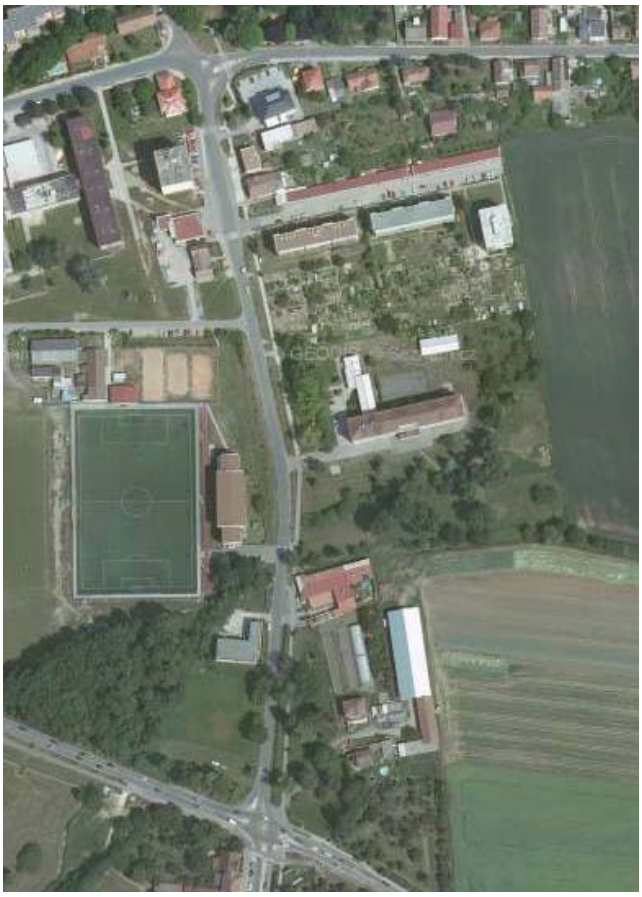
Fig. 1 – Trnovska Street localization in Pardubice

Trnovska Street is the frontage road where the drivers can drive at speeds of 40kph. There are the primary school, the school gymnasium, the football field, the municipality and the health centre. There are the family houses and a number of the blocks of flats in the surrounding (Figure 2).

There were same problems before reconstructions (Figure 2):

- inconvenient cross-roads in the north part of this street,

- non-marked traffic lanes,
- absent cycle truck,
- absent elements for the disabled people etc.



Source: www.seznam.cz

Fig. 2 – Trnovska Street before the reconstruction

## 2.2. Trnovska Street after the reconstruction

The street was traffic calming by providing access roads and shared surface. The road was designed by geometry for a speed 40 kph. The reduce speed was encouraged by marking lines and center island narrowings (Figure 3).

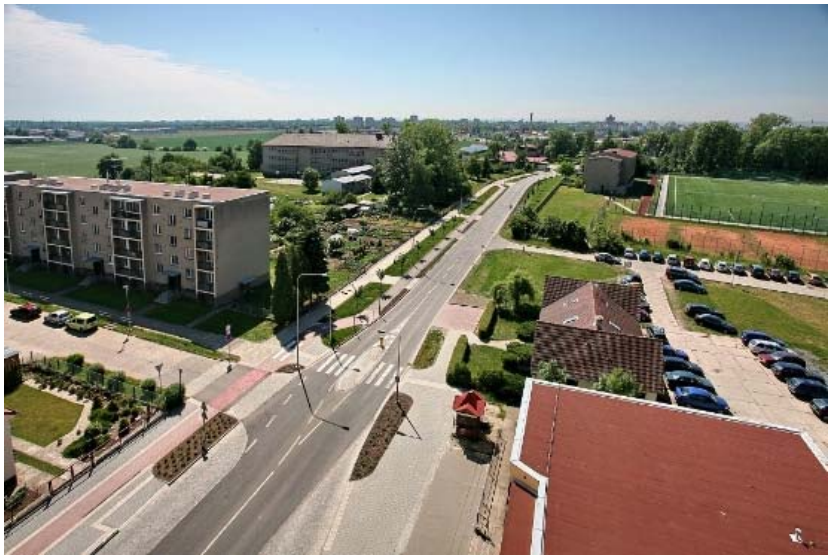
There are three center island narrowings. They are combined with the crosswalks. This center island narrowings increase pedestrian safety too. They said that average of 7% decrease in the 85th percentile travel speeds (1).

The cycle track was built there too (Figure 3). “The cycle track Ohrazenice” is the part of Pardubice cycle tracks network. The two-way cycle track is on the left side of the street front-facing to centre of Pardubice. It is connected to Pardubice cycle tracks network on the traffic circle Podebradska – Trnovska.

The first part of this cycle track (123 m) is a typical cycle track arrangement with the track separated from the carriageway by a verge. The second part of this cycle track (130 m) is cycle track line to guarantee cyclists and other permitted users their own segregated space.

The footway and the cycle track are segregated by the raised white line delineator. The third part of this cycle track (222 m) is unsegregated cycle track and footway.

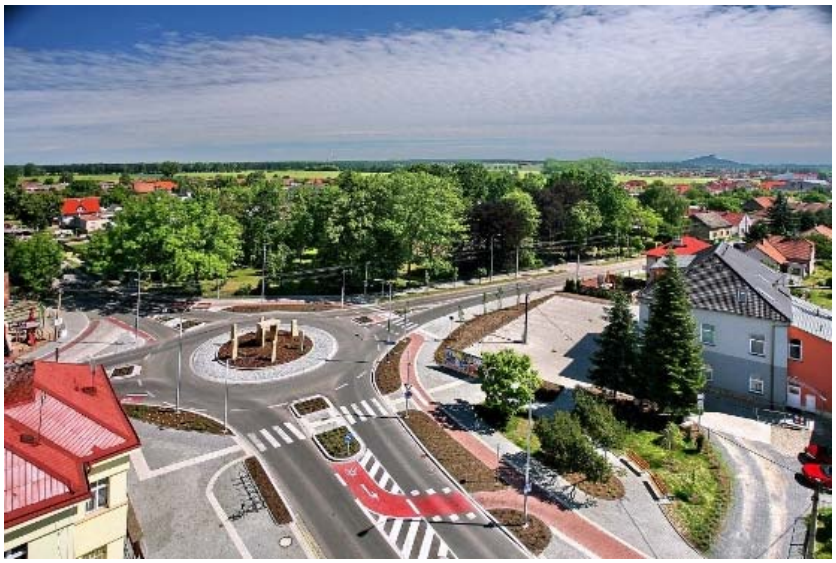
The cycle truck, the footways and the crosswalks have same elements for the disabled people.



Source: Author

Fig. 2 – Trnovska Street after the reconstruction

The cross-road (Trnovska – Pohranovska – Hradistka) was reconstructed on the traffic circle (Figure 4). The original cross-road was very inconvenient (Figure 1).



Source: Author

Fig. 2 – Trnovska Street after the reconstruction

The new cross-road is good for calming intersections. The large vehicle traffic was not a major concern but speeds, volumes, and safety was problems there. They say (3) that average of 11% decrease in the 85th percentile travel speeds.

The new traffic circle is designed well, it has positive aesthetic value and it is the new view point of this space.

## 3. CONCLUSION

The reconstruction result is very successful and it bellows to the best one in Czech Republic. Made traffic calming is comparable with used traffic calming in other European countries.

The result meets the general objectives of traffic calming:

- to encourage citizen involvement in the traffic calming process by incorporating the preferences and requirements of the citizens,
- to reduce vehicular speeds,
- to promote safe and pleasant conditions for motorists, bicyclists, pedestrians, and residents,
- to improve the environment and liveability of neighbourhood streets
- to improve real and perceived safety for no motorized users of the streets,
- to discourage use of residential streets by non-citizens cut through vehicular traffic.

## 4. ACKNOWLEDGEMENTS

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## REFERENCES

[1] U.S Department of transportation, *Traffic calming*, [online]. [9.12.2009]. Available from www.fhwa.dot.gov/environment/tcalm/

[2] Slinn Mike, Matthews Paul and Guest Peter. *Traffic Engineering Design (Second Edition). Principles and Praktice*. 2005. ISBN: 978-0-7506-5865-2

[3] Scottish Executive, Cycling by Design [online]. [9.12.2009]. Available from http://www.scotland.gov.uk/library2/cbd/cbd-08.asp

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