TRAFFIC CALMING PROBLEMS IN NEIGHBOURHOODS

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Summary: The article deals actual problems which result from project of traffic calming area. There are three examples of the traffic calming areas. Two of them are examples of "Zone 30" and the next one is the no good example of "Residential Zone". There are shown different curbs, which are used in traffic calming.

Key words: traffic calming, Zone 30, Residential Zone.

1. AREA TRAFFIC CALMING

Area traffic calming ways are "zone 30" and "Residential Zone". The selection one of these ways has to respect all of differences which follow from traffic rules. These differences go for: speed limit, parking, organization of traffic space. It is shown at Tab. 1.

Tab. 1 – The characteristic of "Zone 30" and "Residential Zone"

	Zone 30	**Residential Zone**
Speed limit	30 km/h	20 km/h
Parking	on all places where it isn´t outlaw	only on signposted places
Traffic space organization	the traffic space is segregated for pedestrian and communal space for cyclists and vehicles	communal space for pedestrian, cyclists and vehicles

Source: author

There are some precautions for calm traffic. They share the goal of reducing vehicle speeds, improving safety, and enhancing quality of life. The advantages and disadvantages of speed control precautions are shown in Tab. 2. The advantages and disadvantages of volume control precautions are shown in Tab. 3.

Tab. 2 - Speed control precautions

Precaution	**Advantages**	**Disadvantages**
Speed humps	- relatively inexpensive; - relatively easy for bicycles to cross if designed appropriately; - effective in slowing travel speeds.	- "rough ride" for all drivers (inclusive for example emergency vehicles); - increase noise and air pollution; - aesthetics.
Speed tables	- smoother on large vehicles (such as fire trucks) than Speed Humps; - effective in reducing speeds, though not to the extent of Speed Humps.	- aesthetics, if no textured materials are used; - textured materials, if used, can be expensive; - increase noise and air pollution.
Raised crosswalks	- improve safety for both pedestrians and vehicles; - positive aesthetic value;	- expensive textured materials; - considered impacts on drainage; - increase noise and air pollution.

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	- effective in reducing speeds, though not to the extent of Speed Humps.	
Raised intersections	- improve safety for both pedestrians and vehicles; - positive aesthetic value; - can calm two streets at once.	- expensive, varying by materials used; - considered impacts on drainage; - less effective in reducing speeds than Speed Humps, Speed Tables, or Raised Crosswalks.
Textured and colored pavement	- reduce vehicle speeds over an extended length; - positive aesthetic value; - can calm two streets at once.	- generally expensive, varying by materials used; - more difficult for wheelchair users and the visually impaired.
Traffic circles	- very effective in moderating speeds and improving safety; - positive aesthetic value - can calm two streets at once	- difficult for large vehicles to circumnavigate; - designed so that the circulating lane does not encroach on the crosswalks; - require the elimination of some on-street parking; - landscaping must be maintained, either by the residents or by the municipality.
Roundabout	- can moderate traffic speeds on an arterial; - generally aesthetically pleasing if well landscaped; - enhanced safety compared to traffic signals; - minimize queuing at the approaches to the intersection; - less expensive to operate than traffic signals.	- difficult for large vehicles to circumnavigate; - designed so that the circulating lane does not encroach on the crosswalks; - require the elimination of some on-street parking; - landscaping must be maintained, either by the residents or by the municipality.
Chicanes	- discourage high speeds by forcing horizontal deflection; - easily negotiable by large vehicles except under heavy traffic conditions.	- designed carefully to discourage drivers from deviating out of the appropriate lane; - curb realignment and landscaping can be costly, especially if there are drainage issues; - require the elimination of some on-street parking.
Realigned intersections	- effective reducing speeds and improving safety at a T-intersection that is commonly ignored by motorists.	- curb realignment can be costly; - require some additional right-of-way to cut the corner.
Neckdowns	- improves pedestrian circulation and space; - through and left-turn movements are easily negotiable by large vehicles; - create protected on-street parking bays; - reduce speeds, especially for right-turning vehicles.	- effectiveness is limited by the absence of vertical or horizontal deflection; - slow right-turning emergency vehicles; - require the elimination of some on-street parking near the intersection; - require bicyclists to briefly merge with vehicular traffic.
Center-Island Narrowings	- increase pedestrian safety; - positive aesthetic value; - reduce traffic volumes.	- their speed-reduction effect is somewhat limited by the absence of any vertical or horizontal deflection; - require elimination of some on-street parking.

Chokers	- easily negotiable by large vehicles; - if designed well, they can have positive aesthetic value; - they reduce both speeds and volumes.	- effect on vehicle speeds is limited by the absence of any vertical or horizontal deflection; - require bicyclists to briefly merge with vehicular traffic; - require the elimination of some on-street parking.

Source: (1), to create

Tab. 3 - Volume control precautions

Precaution	Advantages	Disadvantages
Full street closures	- able to maintain pedestrian and bicycle access; - effective in reducing traffic volume.	- require legal procedures for street closures; - cause circuitous routes for local residents and emergency services; - expensive; - limit access to businesses.
Half closures	- able to maintain two-way bicycle access; - effective in reducing traffic volumes.	- causes circuitous routes for local residents and emergency services; - limit access to businesses; - depending on the design, drivers may be able to circumvent the barrier.
Diagonal Diverters	- not require a closure per se, only a redirection of existing streets; - able to maintain full pedestrian and bicycle access; - reduce traffic volumes.	- cause circuitous routes for local residents and emergency services; - expensive; - require reconstruction of corner curbs.
Median Barriers	- local street connections to main streets where through traffic along the continuing local street is a problem; - main streets where left-turns to and/or from the side street are unsafe.	- improve safety at an intersection of a local street and a major street by prohibiting dangerous turning movements; - reduce traffic volumes on a cut-through route that crosses a major street.

Source: (1), to create

2. THE EXAMPLES OF AREA TRAFFIC CALMING IN PARDUBICE

Three examples of traffic calming areas will be given in the next part of this article.

2.1 The housing estate Dukla

The first calm traffic area is part of housing estate Dukla (see Fig. 1). There are apartment houses and relatively a lot of lawn and planting.

Source: mapy.cz

Fig. 1 – The housing estate Dukla

It is a typical case of "zone 30". The pedestrian use for their trips pavements. The pavements are wide enough with qualitative stone-paved surface and components for people with disabilities, people with infant in pram etc. The cyclists use the traffic space with vehicular. All of the calming traffic precautions are relatively easy for bicycles to cross. The all intersections are unregulated in this area; the traffic is operated only by "right hand rule".

The calm traffic has been under way gradually for a few years. At first the parking problem started to solve. New parking places were building on the places between the houses (see Fig. 2). The parking lines were building on the road verges. The parking lines were building from textured material and that´s why they are very good distinguishable. The parking lines are broken by green places with tree. This is very aesthetic. The parking lines made traffic lines smaller and it have very positive effect on vehicular speed (see Fig. 3).

Source: author

Fig. 2 – Parking places between the houses

Source: author

Fig. 3 – Parking lines

The next traffic calm precaution is raised intersection – flat raised area covering an entire intersection, with ramps on all approaches and with the brick on the flat section (see Fig. 4). This intersection is situated on entrance to "Zone 30". It is an apposite precaution which alerts to the transport mode change to drivers.

Source: author

Fig. 4 – Raised intersection

The next precaution which moderate traffic speed on arterial is raised roundabout with raised crosswalks (see Fig. 5). Roundabouts are used on higher volume streets to allocate right-of-way between competing movements. This intersection suggests to drivers that they drive past "Zone 30".

Source: author

Fig. 5 – Raised roundabout with raised crosswalks

More, by raising the level of the crossing, pedestrians are more visible to approaching motorists. The raised crosswalks are in the whole this zone (see Fig. 6). All of the crosswalks are equipped with the components for people with disabilities (blind people).

Source: author

Fig. 6 – Raised crosswalks

That zone is very good example of traffic calming. The demands of all users are all accommodated. The role of vehicular is repressed in spite of it meets function of resident traffic of all area.

2.2 The housing estate Závodu Míru

The second calm traffic area is part of housing estate Závodu Míru (see Fig. 7 and 8).

Source: mapy.cz

Fig. 7 – The housing estate Závodu Míru

Zdroj: mapy.cz

Fig. 8 – The photomap of the housing estate Závodu Míru

There are apartment houses (tower buildings) and relatively a lot of lawn and planting too. It is next example of "zone 30". It is only one straight, long, dead end street.

The pedestrian use for their trips pavements with components for people with disabilities, people with infant in pram etc. The cyclists can use the traffic space with vehicular or separated bikeway, which runs along the river. There aren´t any calming traffic precautions inside this zone. And this is the reason, why the drivers don´t respect maximum allowable speed.

The roundabout outside the zone entrance has positive effect on vehicular speed (see Fig. 9).

Source: author

Fig. 9 - Roundabout outside the zone entrance

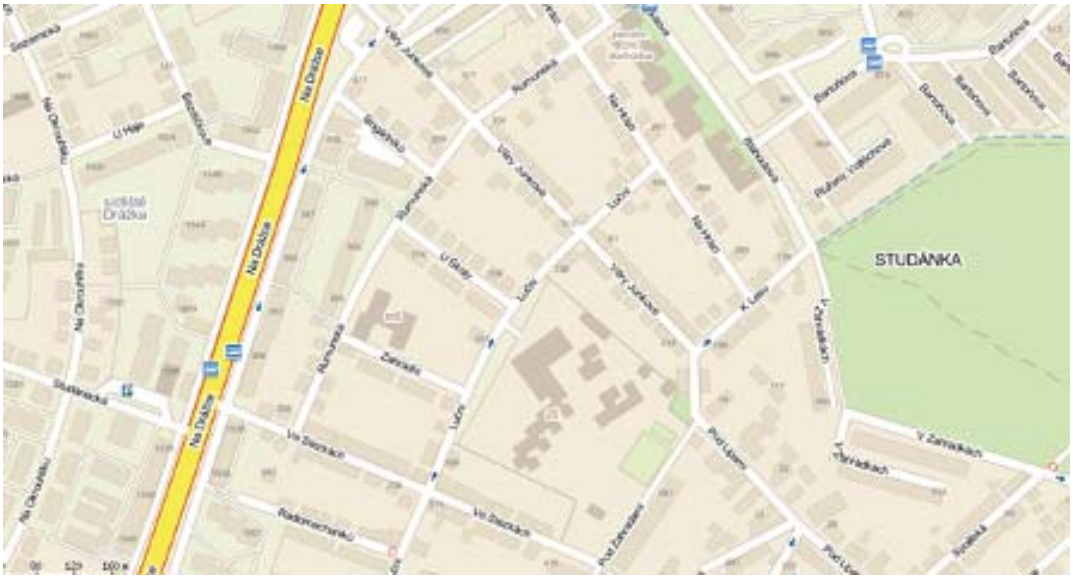
There is suitably adapting crosswalk with center-island narrowing (see Fig. 10). Center-island narrowing increases pedestrian safety – it split the cross distance in halves. It reduces traffic volumes by traffic lines smaller.

Source: author

Fig. 10 – Crosswalk with center-island narrowing

2.3 The neighborhood Studánka

The third example of calming traffic area is part of town Studánka (see Fig. 11), surroundings the basic school (see Fig. 12).



Source: mapy.cz

Fig. 11 – The neighborhood Studánka

Source: mapy.cz, to create

Fig. 12 – The vicinity of the school

There are family house only. In this time the one street (called Věry Junkové) is marked as “Residential Zone”. But the rules of traffic space organization aren´t observe space arrangement of “Residential Zone” (see Tab. 1 and Fig. 13).

There isn´t communal space for pedestrian, cyclists and vehicles, but the pedestrian use for their trips pavements - it´s regular for “Zone 30”.

The parking places are situated alternately on the road verges as chicanes. They are marked by vertical and horizontal marks. But the horizontal mark already isn´t evident (see Fig. 14). The vehicular often don´t respect marked parking buy and that´s why is very difficult to go through this street.

Source: author

Fig. 13 – The traffic space on the “Residential Zone”

Source: author

Fig. 14 – The parking buy vertical and horizontal marks

The street which runs around the school is one-way. There isn´t reduce the vehicular speed. Every morning many of vehicular parked on the road verges. But because the road is narrow, the vehicular often parked on the grass partly (see Fig. 15). The parking buys of tape "Kiss and Park" are absent. It is indicated in the time of school actions too. Sometime, about four times in year, the policemen control the parking and they tip off the drivers which park incorrectly; but it isn´t adequate.

Source: author

Fig. 15 – The parking next to the school

There are only two traffic calming precautions on the "Residential Zone". The road narrow is one of them (see Fig. 16). This is near entrance to "Residential Zone" and it has positive effect on the vehicular speeds.

Source: author

Fig. 16 – The road narrow in "Residential Zone"

Speed humps on the "Residential Zone" entrance are the second curb (see Fig. 17). Speed humps are good for locations where very low speeds are desired and reasonable, and noise and fumes are not a major concern.

Source: author

Fig. 17 – The speed hump in entrance to "Residential Zone"

This area isn´t traffic calming in conformity with (2), (3). It could be apposite to mark "Residential Zone" as "Zone 30". The "Zone 30" could be extended on all-area with family houses. All of the one-way street could be mark as "Residential Zone". It could be apposite to supplement the traffic calming area by some curbs.

CONCLUSION

There are described three traffic calming areas in Pardubice. One of them, housing estate Dukla is example of very good solution of traffic calming. There are used different curbs, which carry out their function. The traffic space is adapted for move of all users. There are good used components for people with disabilities, people with infant in pram etc.

The second area is housing estate Závodu Míru. It is next example of "zone 30". Because there aren´t any curbs inside traffic calming area - on the straight, long street, the drivers often don´t respect maximum allowable speed.

The third area is part of the town Studánka. It´s example of the wrong traffic calming area project - it isn´t in conformity with (2), (3).

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