

This document is intended to give a quick guide. The downside is the risk of approximation and incompleteness. For more information please consult the documents referenced in this document

Urban chicanes placed at conurbation entrances

The provisions given in the diagram below at town entrances provide a transition between the outside of a built-up area and the urban environment. To make the area legible, a break in the road is necessary to ensure that drivers reduce their speed. Its position must be consistent with present and future urban shapes.

Quite often, aside from the usual message, use of a physical traffic calming device is necessary. A chicane can be used for this purpose.

This document is intended to give a few key responses to questions from the technical services of local authorities, the state or design offices regarding creating chicanes at the entrances of built-up areas. This document was created in the absence of the coming guide to chicanes and pinch points.

This document gives general principles for creating a chicane at the entrance to a built-up area, taking into account all users, and its geometric features.

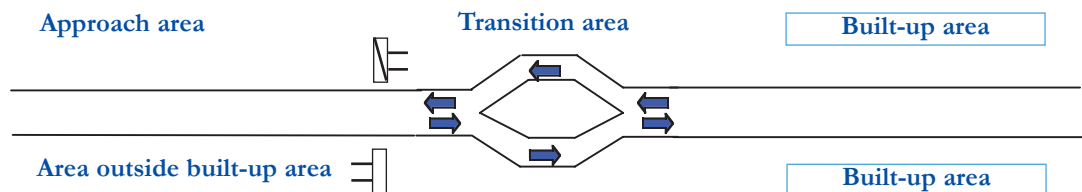


Chicane with central traffic island.



Chicane without central traffic island.

Photos F. TORTEL/CETE de l'Est



Approach area: road sequence prior to the introduction of the urban area which is always situated before the sign for the built-up area that provides a transition between the area outside the built-up area and the urban area.

Transition area: road sequence always situated after the sign for the built-up area

General context

A chicane consists of an offset in the line of the road with a significant deflection of trajectory.

It is one of several devices for reducing speeds at the entrance to built-up areas used to underline the transition from a road to a street with its more complex features (more pedestrians, more manoeuvres, etc.). Always situated after the sign at the entrance to a built-up area and sometimes preceded by an approach zone, a chicane reinforces the perception of entry into a town.

Generally limited to 50 km/h, the area between the entrance sign for a built-up area and the chicane can however have a speed limit of 70 km/h (by bylaw) if local residents' driveways and pedestrian crossings are limited in number and protected by suitable devices (article R413-3 of the French Highway Code). In this case, if the chicane is placed after this area, it is useful to limit speeds to 50 km/h with the help of a B14 sign placed up from the chicane.

Assessments of chicanes have shown that, after installation, speeds are reduced and then climb again very slightly, stabilising in the fifth month, and chicanes have a stronger influence on speeding motorists.

Regulations

Chicanes are always expected to be used after the entrance sign for a built-up area limiting speeds to 50 km/h.

To date, there is no specific regulation covering chicanes. However, the device should be installed in accordance with the design rules of any urban highway, especially regulations concerning accessibility for handicapped people and those with reduced mobility, the French Highway Code and environmental regulations, the inter-ministerial instruction on road signs and markings, etc.

The recommendations given in this document come from discussions with specialists and assessments of chicanes on main roads in the transition area from open countryside to town.

General installation principles

The principle of a chicane is the result of studies of entrances to built-up areas and contributes to their valorization. Coming from an overall prior analysis of the site, the chicane

its efficiency in terms of careful positioning in a relevant area in line with its environment. The chicane should not thus have an effect on its environment but rather make the most of it.

For reasons of visibility and vehicle dynamics, placing a chicane on a bend, at the top of a hill or on a road with more than one lane for each direction of travel is not recommended. It can be placed on a junction at the entrance to a built-up area by the creation of a Left Turn lane in a chicane, for example, slowing down turning movements and making them safer (in this event, if better vehicle parking space is required, the traffic island can be extended without reducing the chicane's efficiency).

Legibility

A chicane is intended to increase the view of an entrance to a built-up area and reduce speed. In order for it not to be an isolated device, the sign at the entrance of the built-up area can be preceded by an approach area with a progressive change in road features to that of a street (progressive use of plants and street furniture, changes to kerbs and roadside, etc.). It can be useful to put a chicane near a name sign at the entrance of a built-up area and inside the built-up area itself so they mark the transition between the open countryside and an urban area and so the user can make the connection between the sign and the device.

Visibility

Visibility distance is the distance from which the chicane and the entrance sign are visible. It helps users identify the device and the entrance to the built-up area and thus modify their speed. In all events, it is advisable for visibility distance from the sign at the entrance to the built-up area associated with the chicane for an approaching vehicle is at least the same as the stopping distance at a speed of V_{85}^* (cf. table from the ARP - major road layout - below).

V_{85}^* (km/h)	50	60	70	80	90	100
Stopping distance in right alignment (m)	50	65	85	105	130	160
Distance (m) travelled to go from V_{85} to 50 km/h	0	37	57	77	102	132

V_{85}^* Maximum speed of 85% of vehicles Distances calculated for a reaction time of 2s on a wet road.

If this is not possible, it should at least match the distance to go from V 85 to 50 km/h. If the chicane is very far from the entrance sign for the built-up area, the same rules apply for the chicane.

Islands and kerbs

The position of vertical items on the traffic island and roadside gives volume to the device, reinforces visibility and creates a wall effect, reducing speeds.

Usually, this effect is stronger if the vertical elements are near the roadside: it also tends to work on the fastest road users. The kerb of the central island and roadsides also participate in this wall effect.

Vertical elements placed on the first few metres of the traffic island and on the kerbs must not be rigid obstacles or block the view for junctions, nearby driveways or pedestrian crossings. At the end of the traffic island, it is highly recommended to place non-aggressive kerbs on the side outside the built-up area. Lateral kerbs on the traffic island and roadside can be high to mark the wall effect but their height must take into account exceptional loads. It is also recommended to avoid sharp corners and replace them with rounded corners over a short length to avoid motorists damaging their tyres. The traffic island covering should contrast sufficiently with that of the road.

Road signs and markings

A chicane in a built-up area does not have specific regulatory road signs.

To increase legibility and visibility of the chicane, it is recommended to use a J5 post at the head of the traffic island if it is a central island, on the outside of the built-up area and especially if there are no vertical or decorative elements such as flowers and plants.

Road markings in a chicane are not essential. They increase the physical width and reduce the sense of restricted trajectory. On the kerbs of the central traffic island, white reflective paint or white reflective elements can be used if visibility of the device requires it.

Separators (small oval kerb or simple marking)

In the event of a single or double chicane, a separator for physically separating the two lanes and improving visibility can be used.

In this event, the separator must be visible and the ends of the separator must not be aggressive, especially on the entrance side away from the built-up area. This device can only be used for reduced speeds noted before the built-up area because of the risk of surprise that a separator can create (it is less visible than a central traffic island because it is thinner and does not separate traffic flow as much as a true traffic island).

Lighting

Street lighting is intended to improve visibility on the road and its surroundings for users. It should help drivers in adapting their visual level of adaptation. As part of this, there are two uses possible in a chicane to maintain a level of lighting between the chicane and the road further on into the built-up area.

– If the road before and after the chicane is not lit, it is not advisable to light the chicane either. This lighting can create shadows before and after the chicane and reduce general visibility for the driver on either side.

In this event, special attention should be paid to road markings or signs for the separating island (e.g. white reflective paint or white reflective devices) and visibility of the chicane itself.

– If the road after the chicane is already lit, the chicane should also be lit at the same level as the rest of the urban road. A light transition area before the chicane can be used if light levels on the urban road are different from those outside the built-up area (especially if the road is not lit); this helps the user adapt visually to the lighting.

In the latter case, care should be taken when installing street lamps so they do not form an aggressive obstacle if a vehicle loses control. Installation on the first few metres of a central traffic island or near lateral kerbs should be avoided.

Winter visibility

For chicanes, it is essential to consider their use in winter.

Unforeseen additional investments or changes to the device can be the result of a design not taking this aspect into account from the start.

There can be several types of issue:

- look at the widths of winter service vehicles used locally so as to optimise road clearing quality.
- provide a suitable radius on bends for winter service vehicles to pass with a blade attached;
- estimate the height of kerbs compatible with removal of snow, the intensity of which can vary from one area to another;
- use mobile blocks and posts rather than fixed ones.

If it is not possible to take all these items into account, measures can be implemented together with operating authorities in charge of winter maintenance.

Taking all users into account

As a transition device marking the entrance to a built-up area, the chicane must meet the requirements of all users in terms of safety, occupation and space sharing. A chicane is thus not reserved just for light vehicles that will not be covered in this section. Public transport, HGVs, exceptional loads, motorised two-wheel vehicles, cyclists and pedestrians all need to be taken into account.

In all events, the width of the road dictates the position of the chicanes.

Pedestrians

Analysis of the pedestrian route must be carried out before considering installing a chicane. It should not remove accessibility features and care must be taken with the effects on pedestrian paths around the chicane. Regulation for accessibility to roads for handicapped people and those with reduced mobility must be observed (the decree 2006-1657 of 21 December 2006 and the order of 15 January 2007 relating to accessibility to roads and public spaces must be applied).

Changes to pedestrian crossings in the area must be justified by reasons of safety and usage. There are three types of situation:

- When creating a chicane with a central island, if the width of the island is larger than or equal to 2 metres, the island can be used as a refuge for pedestrians and a pedestrian crossing can be built on the chicane itself.
- For a double chicane, if the right-hand alignment between the two deflections is large enough, a pedestrian crossing can be built preferably in the centre of this right alignment.

- For a single chicane, it is best to put a pedestrian crossing down from the chicane and inside the built-up area far enough away from the end of the device.

Cyclists

The challenge here is to ensure that cyclists are not endangered when passing through the chicane. Cyclists do risk finding themselves pinned between the kerb and an overtaking vehicle.

This restriction of motorised vehicles means that a cycle lane on a chicane is not recommended. This means that the motorist (especially one used to driving through the chicane) can end up driving over a cycle lane, which is dangerous for cyclists and thus cancels out the effect of reduced speed. Depending on the needs and restrictions of traffic and the layout of the site (reduced width, cycle lane on either side of the device), cycle lanes or paths that go round the device are recommended. For a choice between a cycle lane and an escape lane, there are two possibilities:

- If a cycle lane exists on either side of the chicane, it is recommended to maintain continuity around the chicane. Existing cycle lanes at chicane level will be turned into cycle paths with a physical separation from the road.
- If there is no cycle lane on either side of the chicane, it is recommended to create an escape path around the chicane with a bevelled edge before it allowing cyclists to enter.

The route must be clear and unambiguous. For that, the cycle lane must be clearly visible and differentiated from the main road.



Chicane with central island and escape lane for cyclists.

Photo CG 67

Motorised two-wheeled vehicles

The restrictions of a chicane for motorised two-wheeled vehicles is less than that for other types of vehicle.

A road planner can therefore make the error of creating too narrow a chicane, forgetting the dangers this poses for all users.

Unlike for cyclists, the risks of being trapped against the kerb is less given the equivalent speed to other approaching vehicles.

A special lane is therefore not required for motorised two-wheeled vehicles.

The precarious balance of two-wheeled vehicles makes them very sensitive to the state of the road so the following points are important:

- Limit painted markings on the road as these can provide different grip to normal road surface.
- Make sure that the road provides sufficient grip, especially in rain to avoid slipping.
- Make sure the road surface is well maintained. Pot-holes, cracks and gravel should be avoided.
- For a facility in the countryside, make sure that that rainwater or irrigation water does not sit on the road.

Wide vehicles and exceptional loads

Traffic calming devices such as chicanes should not be incompatible with wide-berth vehicles such as exceptional loads, agricultural machinery, HGVs and buses.

Specific adaptations will ensure that wide vehicles can pass (including occasional police measures) by maintaining consistent road dimensions such as, for example, the use of separating islands with kerbs that can be crossed and retractable signs.

Curb lanes should have a different surface from the main road. They can be on the same level or cambered (paved, etc.) without compromising the traffic calming nature of the chicane.

Street furniture and plants also should be carefully positioned.

Geometric features

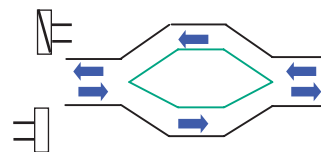
To be efficient, a chicane should restrict driving without being dangerous. This restriction can be a deviation in the trajectory and a restriction on the limits of the road by kerbs. The difficulty is in finding restrictive shape for a light vehicle travelling at 50 km/h while ensuring that other users can pass, given that the available width is often limited by the road platform. Experience shows that this can be obtained with the following geometric shapes.

Different chicane shapes at the entrance to a built-up area

Depending on the initial shape of the site, there are various chicane shapes available: chicanes with a central island and chicanes without a central island. The shape should not dictate the environment but rather work with it in order to make the most of the chicane in its environment.

Chicanes with a central island or reserve

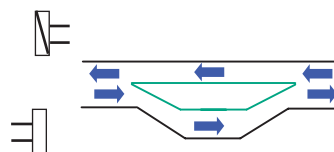
Symmetrical



Advantages: *This is the most commonly used shape.*

Disadvantages: *Can be used in a device outside a built-up area if not accompanied by urban-type elements.*

Asymmetrical



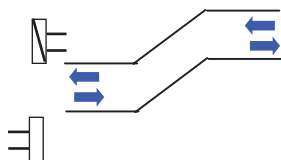
Advantages: *Its width is smaller than with a symmetrical central island. Maintained restriction at entrance to a built-up area. For exceptional loads, the unrestricted road can be more easily designed.*

Disadvantages: *At night, or when there is less traffic, users can be tempted to travel on the opposite lane to avoid the restriction. Risk of higher speed for drivers leaving built-up area.*

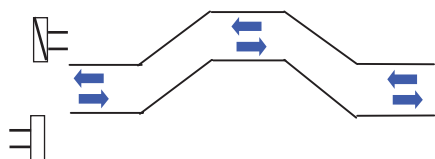
For chicanes without a central island, a precaution should be taken in the device to avoid situations where head-on collisions are a risk at the point of deflection.

Chicane without central traffic island.

Simple



Double



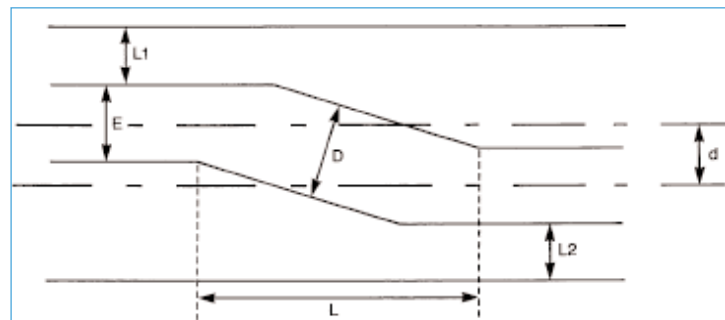
Advantages: Suitable for reduced approach speeds before the device.

Disadvantages: If approach speeds before the chicane are high ($V_{85} > 50$ km/h), its position is risked because no separation markings for traffic flows make the deflection less visible.

A deflection equal to the width of the road creates a real break in alignment.

At the point of deflection, the width of lanes can be enlarged to accommodate vehicle trajectories (especially HGVs). This requires a slight movement between each side of the road in the deflection.

This deflection should be significant (> 2 metres) but should not mean that pedestrian walkways are overly reduced in size.



E: road width before the chicane.

L1, L2: width of pedestrian path.

D: road width at the deflection.

In general the line of trajectory requires the width to be greater at D than at E.

d: deflection.

Table of proposed chicane geometric features

Geometric features	Recommended value	Below	Above
Deflection	Chicane with central traffic island: road width. Chicanes without central traffic island: road width.	If deflection < 2 m: insufficient restriction for light vehicles.	Not problematic if restriction is not too brutal for vehicles.
Deflection slope*	No values currently available. The restriction should be studied so as to provide a vehicle deflection slope of 1/10 (dotted trajectory in diagrams). The chicane restriction does not only depend on the deflection slope but also on the width of lanes at the deflection and the change between each side of the road in the deflection (see diagram below).		
Alignment between two deflections or length of largest radius	Minimum: 20 m	HGVs cannot realign and travel on kerbs.	—
	The shape of the central island can be oval.		
Deflection on entry and exit	Chicanes with an exit that is more restricted than the entrance should be avoided. If the exit is more restricted, risk of crossing to the other lane for HGVs. If impossible due to width, slow traffic on approach.		
Lane width before the chicane	3.2m-3.5m	Restrictions too great for HGVs which hit kerbs.	Light vehicles skid.
Width of escape lane	1.50 m	If deflection < 1 m: it is uncomfortable.	—
Pavement is requirement for pedestrian path	1.80 m clearance for any obstacle.	Minimum: 1.40 m clearance for any obstacle (obligatory).	—

* Deflection slope: deflection/length (see following diagrams).

Chicane layout diagrams

The restriction is a function of the geometric parameters represented below:

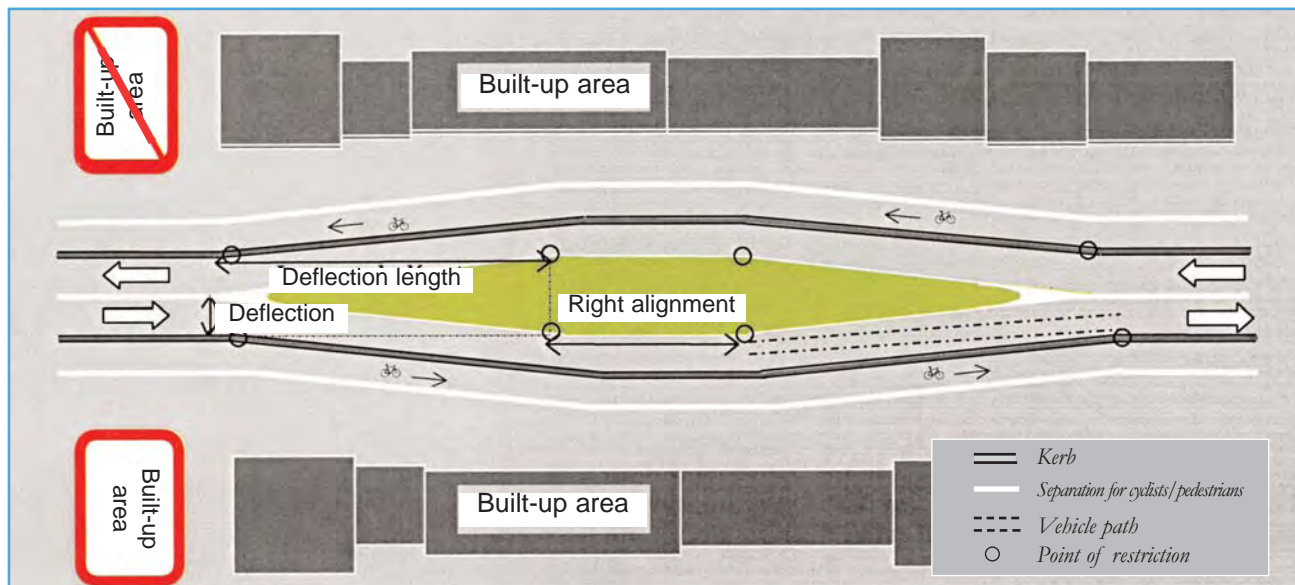
- lateral deflection;
- deflection length;
- deflection gradient.

To keep the same level of efficiency, any changes in one of the parameters leads to changes in the other two.

The preceding table shows recommendations concerning a chicane's geometric parameters.

Lengths are given as a guide only.

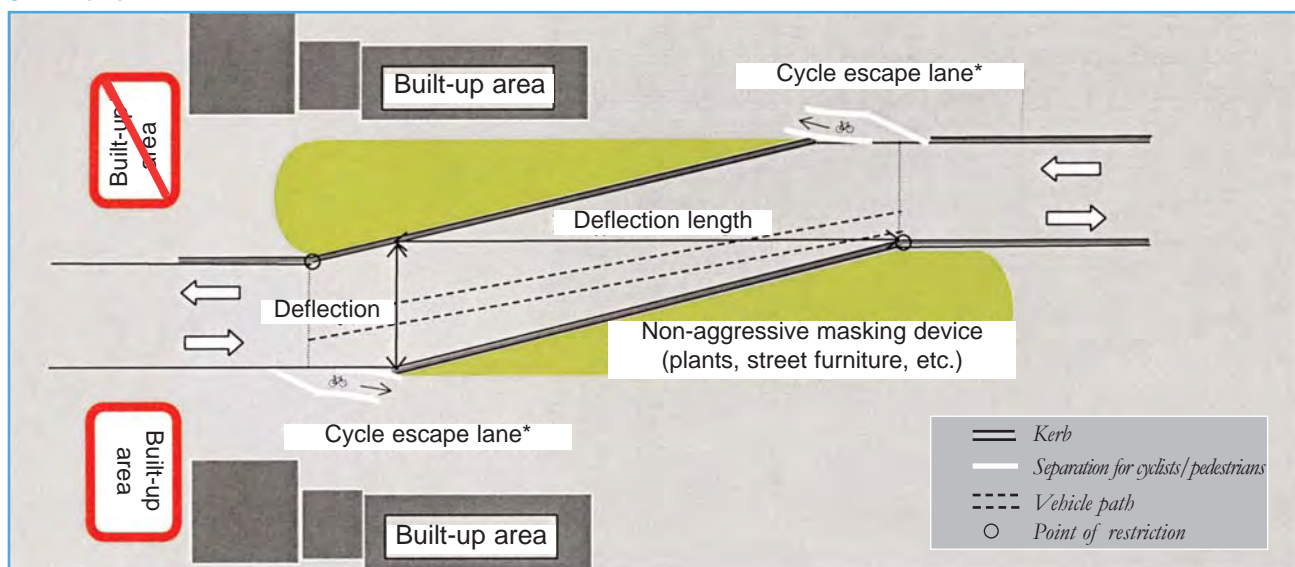
CENTRAL ISLAND CHICANE



Example of a layout for a central island taking cyclists and housing into account.

Cycle lane running along the chicane. There is no single answer. The distances between the restriction points and the vehicle path are identical on either side of the deflection. If an intersection is placed at the entrance to a built-up area, it can be used as a support for a chicane integrating a left-hand turn.

SIMPLE CHICANE

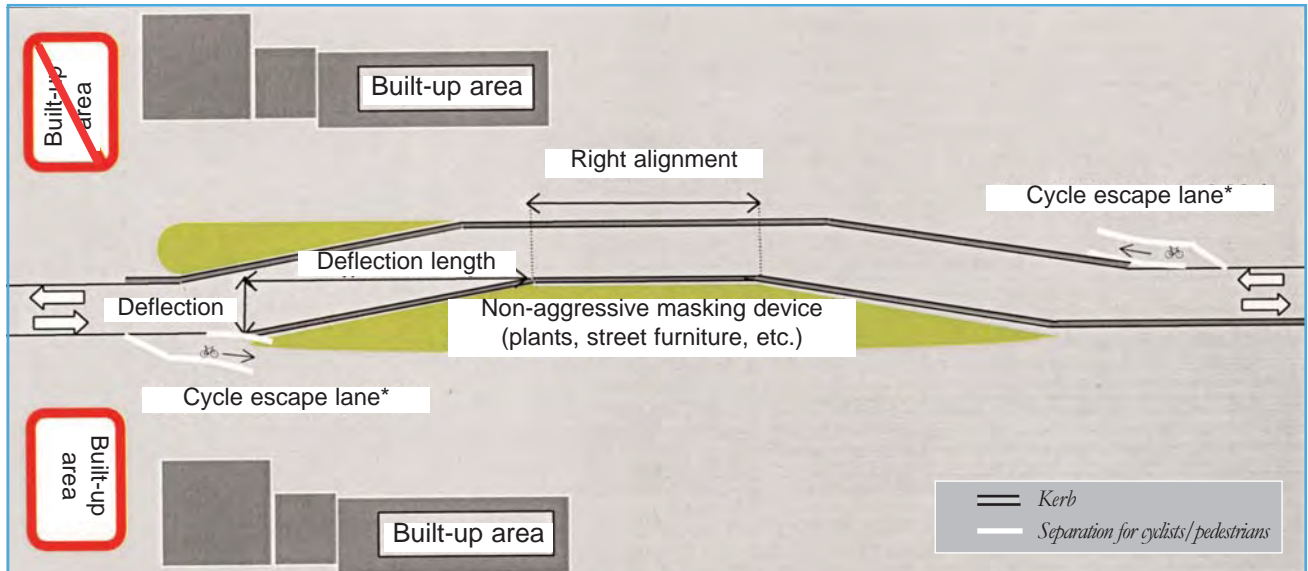


Example of a simple chicane layout with a left deflection and cycle escape lanes and break in perspective after the chicane with rural facilities and no obstacles. Helps guidance by non-aggressive street furniture.

There is no single answer.

* : For inclusion of cyclists on the traffic lane, see recommendations for cycle paths and cycle routes. In the left-right direction, distances between vehicle path and the centre of the road to the right of the first restriction point and the vehicle path and the hardstrip to the right of the second restriction point are identical.

DOUBLE CHICANE



Example of a double chicane layout taking into account cyclists with escape lanes and break in perspective after the chicane with rural facilities and no obstacles.

Helps guidance by non-aggressive street furniture.

There is no single answer.

**: For inclusion of cyclists on the traffic lane, see recommendations for cycle paths and routes.*





Associated subjects

- Definitions of urban
- Speed and road operation in urban areas
- Controlling speed through design
- Visibility
- Countryside and road safety
- Cyclists

Bibliographic references

EXAMPLES OF GOOD PRACTICE

- Document MU VII 05 Série Petits aménagements de sécurité / Entrée d'agglomération / Chicane en entrée d'agglomération (Chicanes at the entrance to built-up areas), LYON Certu, September 2006.
- Document VII 04 Série Petits aménagements de sécurité / Entrée d'agglomération/ Îlot séparateur avec prise en compte des cyclistes (Traffic islands taking cyclists into account), LYON Certu, November 2003.
- Document VII 03 Série Petits aménagements de sécurité / Entrée d'agglomération/ Réduction du nombre de voies et aménagement d'un carrefour (Reducing the number of lanes and creating a junction), LYON Certu, November 2003.

- Document VII 02 Series Petits aménagements de sécurité (Minor safety improvements) / Entrée d'agglomération/ Rétrécissement par îlot franchissable et effet de porte, LYON Certu, December 1997.

- Document VII 01 Series Petits aménagements de sécurité / Entrée d'agglomération/ Chicane avec îlot séparateur en dur (Trafic Poids Lourds faible) (Chicane with traffic island for HGVs), LYON Certu, November 1994.

METHODOLOGICAL GUIDE

- Recommandations pour les itinéraires cyclables (Recommendations on cycle routes), LYON Certu, August 2005.
- Recommandations pour les itinéraires cyclables (Recommendations on cycle lanes), LYON Certu, August 2000.
- Ville plus sûre Quartiers sans accidents Savoir-faire et techniques (Safer cities, accident-free neighbourhoods), BAGNEUX CETUR, 1990.

TO BE PUBLISHED: objective 3rd quarter 2007

- Guide méthodologique pour l'étude d'une traversée d'agglomération (Guide to studying routes through built-up areas).

TO BE PUBLISHED: objective 2008

- Guide méthodologique sur les chicanes et les écluses (Guide to chicanes and pinch points), LYON Certu.

The series of documents "Basic Road Safety" formed part of the MPSR project "Road Safety Management and Practices" by RST working groups managed by Certu for urban areas and by Sétra for interurban areas.
This series of documents is published only for the purposes of sharing experience.
The Administration cannot be held liable for the contents hereof.
These sheets can be downloaded from the following web sites:

- Certu (<http://www.certu.fr>)
- "DSCR road safety "job portal" (<http://securite-routiere.metier.i2>)
- Sétra (intranet: <http://catalogue.setra.i2> and Internet: <http://catalogue.setra.equipement.gouv.fr>).

AUTHORS OF THE INFORMATION SHEET:

Olivier BAILLE for layout
and members of his Working Group on chicanes and those of the Working Group on basic road safety managed by Nicolas NUYTENS to provide the contents of this document: François TORTEL et Stéphanie POISSONNIER (CETE de l'Est), Alexandra BELLARD, Ludovic BURGHGRAEVE, et Jacques COUTY (CETE NC), Franck MONTE et Claude ABIGNOLI (CETE Méditerranée), Jean-Paul TRUFFY (ATTF), Bernard TISSEIRE (AITF), Pierre FISCHER (ASTD), Gilles DUMONCEAU (KEOLIS), Thierry MARSICK (Ville de Grenoble), André DE NEUVILLE (CETE de l'Ouest), Jean-François DURAND (DREIF).

Remerciements à Martine VERTET et Daniel LEMOINE (Sétra), Hubert PEIGNÉ (CGPC), Guy DUPRÉ (CETE NC), Josiane LAVILLE (CETE de Lyon), Nicolas NUYTENS, Jean-Luc REYNAUD, Cyril CHAIN, Hubert TREVE, Catia RENESSON, Hervé CLUZEL, Bertrand CHRISTIAN, Maryvonne DEJEAMMES, Pierre VIATTE et Benoît HIRON (Certu).

YOUR CONTACT AT Certu

Olivier BAILLE
☎ 04 72 74 58 55
Olivier.baille@equipement.gouv.fr

Secretarial office ☎ 04 72 74 59 33