

# Developing a National Directional Signing Standard

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# Summary

A sound Directional Signing system is essential for Road Safety and will be appreciated by road-users. Attractive signs and well-presented guidance contribute to the unique character and positive image of a nation.

Period of rapid road network development is also a golden opportunity for the formulation of a sound directional signing standard. Future rectifications or retrofits of signing infrastructures could be costly and disruptive. Well-conceived design standards in conjunction with practical guidelines are necessary to bring about a satisfactory Directional Signing system.

There are often uncertainties or requests for more signs or more displays on a particular signs. Without adequate control, the directional signing system could become overloaded with adverse consequences on the primary guidance function and aesthetics.

There are many good examples of a sound Directional Signing system worldwide, but not a single country could be considered to have a perfect system. There are also many mistakes which can be learnt. As in any countries, there needs to be adequate flexibility for the evolution of the Directional Signing system. Existing practices may need adjustments as experience is gained.

The purpose of this paper is to explore and share important considerations when developing a national Directional Signing standard for an evolving road network.

# Recommendations

It is highly recommended that a strong effort is made to develop a national Directional Signing standard in conjunction with guidelines while the road network is undergoing rapid expansion.

The Author will be pleased to support any such initiatives and share his experience and knowledge.

# Main Subjects of Directional Signing

## Hierarchy and Master Plan

Route hierarchy and numbering

Destination Hierarchy

Colour scheme

Symbol definition

## Sign Sequence

Sign format in relation to  
junction types

Positioning rules

## Sign Format

Map type format

Arrow format

Lane arrow format

## Sign Supports

Gantry, cantilever, roadside, mast etc

Overall appearance and proportioning

Passive safety

## Sign Face

Character and symbol size

Spacing for blocks and borders

Stacking rules for panels

Aesthetics

# Key Components of Directional Signing

## Expressway and Major Route Signing

- Guidance through expressway interchanges and exits
- Guidance through major inter-urban routes

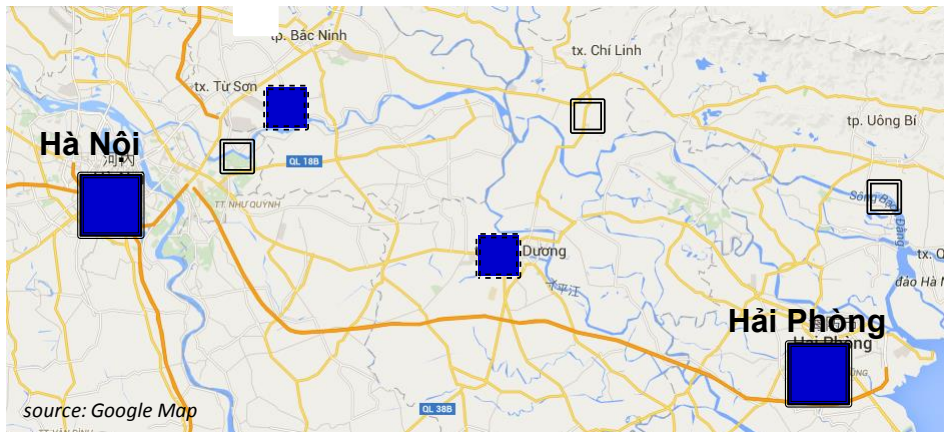
## Urban and Local Signing

- Guidance from expressway exits towards urban areas
- Guidance from urban areas and traffic generators towards expressway and major routes
- Guidance between districts and townships via arterial roads
- Local destination guidance – generally at proximity but may be related to expressways and major routes

# Destination Hierarchy

## Control Destinations

- Four to five levels of destinations could be defined according to population or economic importance
- Control Destinations (Levels 1,2) should be designated at the national level.



## City Districts

Districts could be defined by local Governments according to administration boundaries and road network, taking into account understanding by drivers.



## Route Numbering

Route number of expressways and main routes are destinations themselves. This will alleviate the burden of signing, specially in urban areas and for initial guidance. It is necessary to distinguish on signs whether drivers are on the route itself or the approach to the route.



# Destination Hierarchy

## Expressway Signing

Many countries prefer to reserve green or blue colour for expressways. This is particularly desirable if expressways are tolled. However, the Netherlands has an excellent directional signing based on blue colour only with local destinations signed in a white patch.



## Local Destinations

Many countries adopt white colour for local destinations and facilities. These may include hospitals, railway stations, parkings, smaller towns and city centres etc. Clear guidance for their definition has to be formulated.



## Tourist Destinations

Brown colour is commonly used. Some countries do not permit their display on gantry signs and there are stringent criteria for their qualification. As the road network evolves, there will be an increasing need to show tourist destinations, and the signing system should be able to accommodate them systematically.



# A Well-defined Colour Scheme

## Need for a Colour Scheme

A well-defined signing scheme enables drivers to read directional signs more efficiently. A possible colour scheme consists of:

Green: expressway destinations

Blue: High level control destinations

White: Local destinations

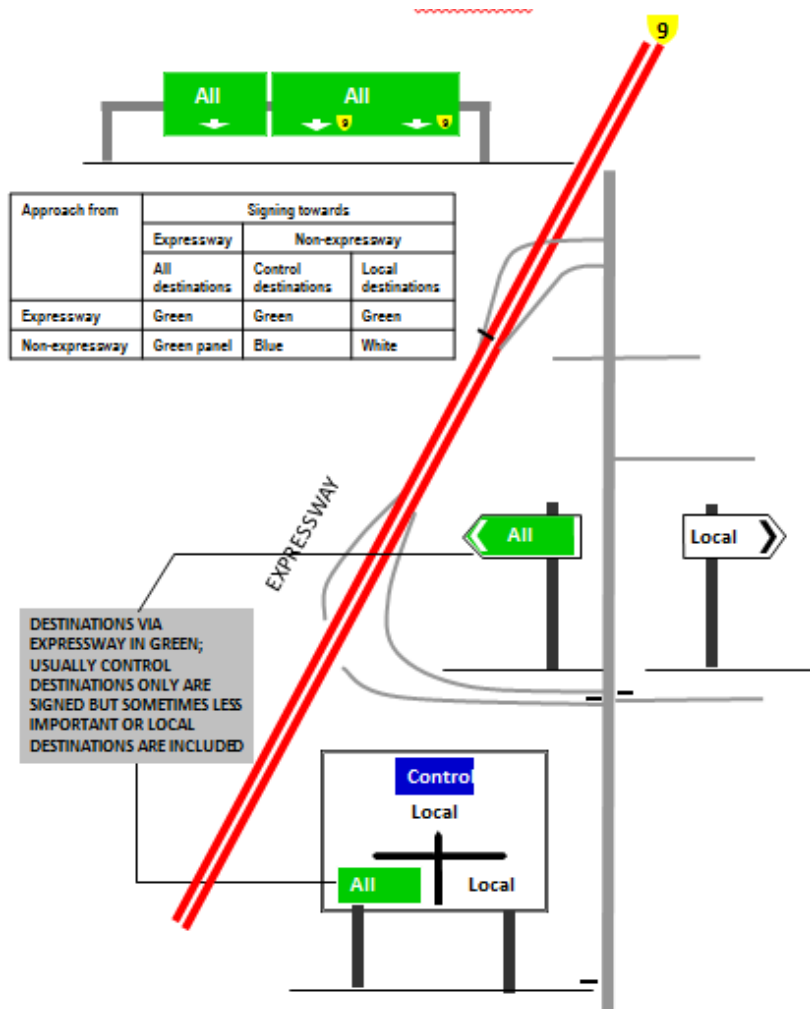
## Other Colours

Brown: Tourist destinations

Yellow: Temporary signs

## Colour Rules

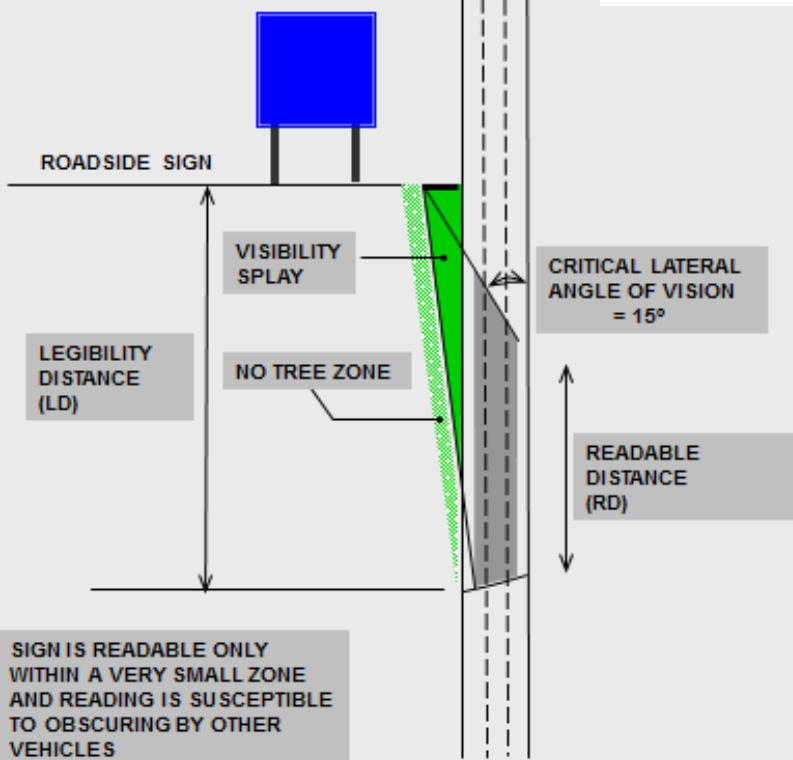
Colour scheme may be based on destination hierarchy alone, but they may also be based on the hierarchy of the approach route and the forthcoming route. Lack of clear definition of design rules could lead to inconsistency and confusion. Early address of this topic is necessary.





# Are Signs Readable and Visible?

**EXAMPLE**  
3-LANE APPROACH  
SIGN WIDTH = 4m  
"x"-HEIGHT = 200mm  
LD = 0.6 "x"-HT = 120m  
RD = 67m  
READING TIME = 3.5s  
(70 km/h)



**Reading Time is Critical**  
Directional signs are read by drivers moving at speed and at an angle. The effective reading time is usually small, in a matter of seconds. This has fundamental implications of signing standard, positioning and design.

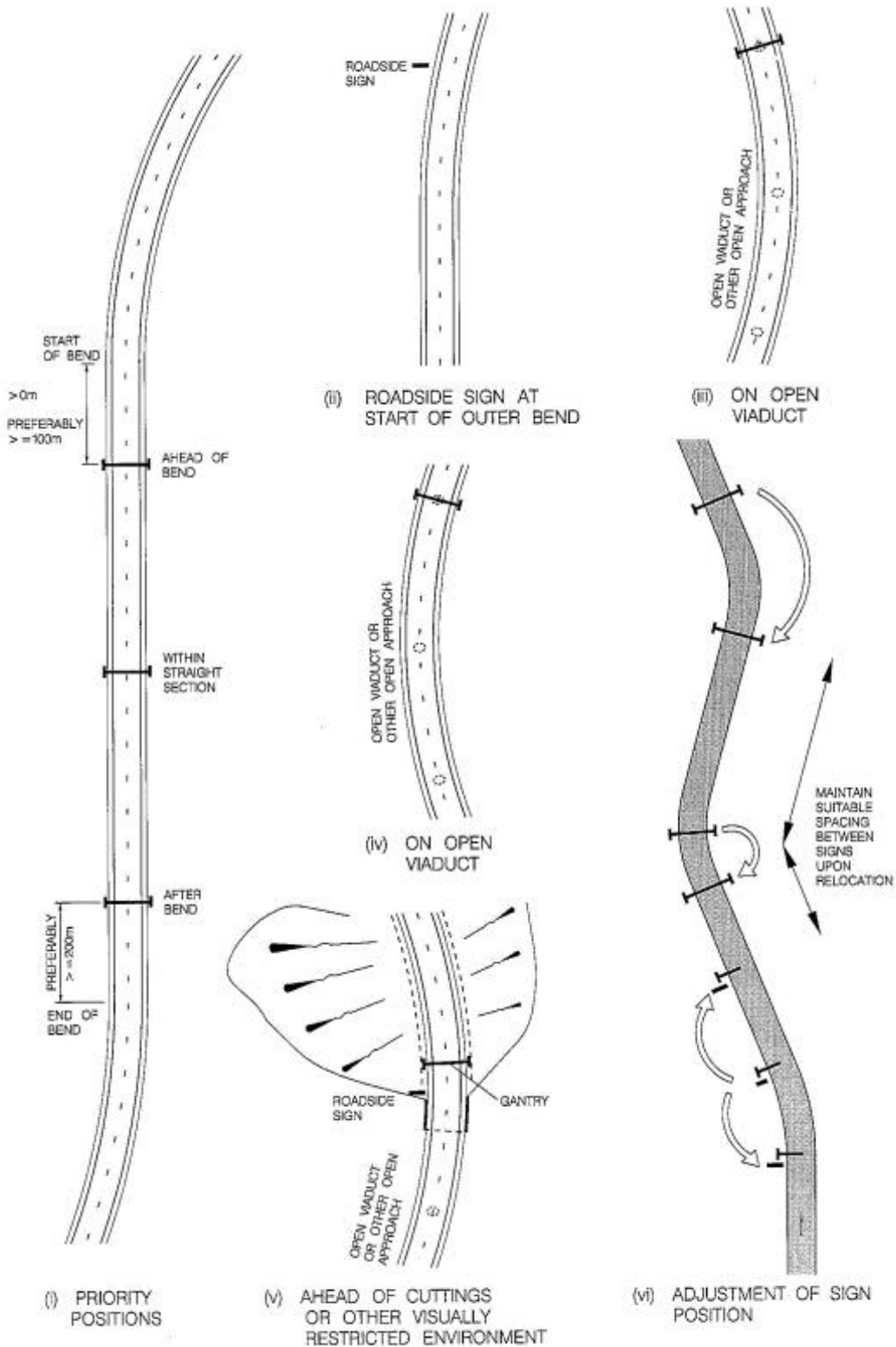
## The Problem of Obscuring

This may be an isolated problem on the part of designers, but could also be a systematic issues whereby sign supports and formats are unrealistic when matched with other design objectives e.g. trees and plantings, noise barriers. Designers also need to be aware of the adverse effects of bends.





# Site-specific Positioning is Important



# Sign Support and Format

## Sign Support and Format

For consistency and easy recognition, sign support and sign format are inter-dependent although certain flexibility is generally desirable. From the national standard point of view, sign support has major economic implications and therefore requires careful selection.

## Overhead Gantry

These are desirable for important interchanges to indicate different directions and to indicate lane selection on expressways and dual carriageway roads.



## Overhead Cantilever

This is an intermediate, cost-saving solution between roadside structures and gantries and has many applications. Visibility is also a merit for overhead signs.



## Map Type Sign

These are only used as Advance Direction Signs and are generally mounted on roadside structures.

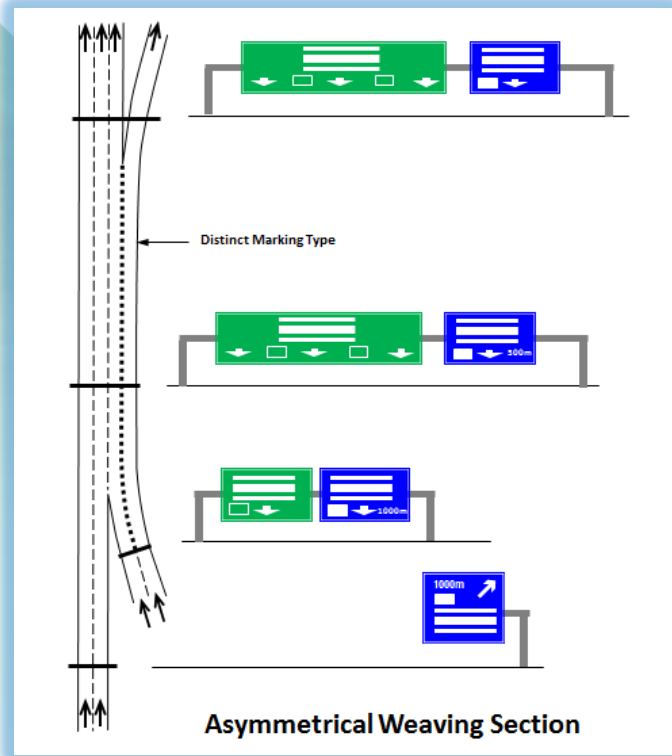
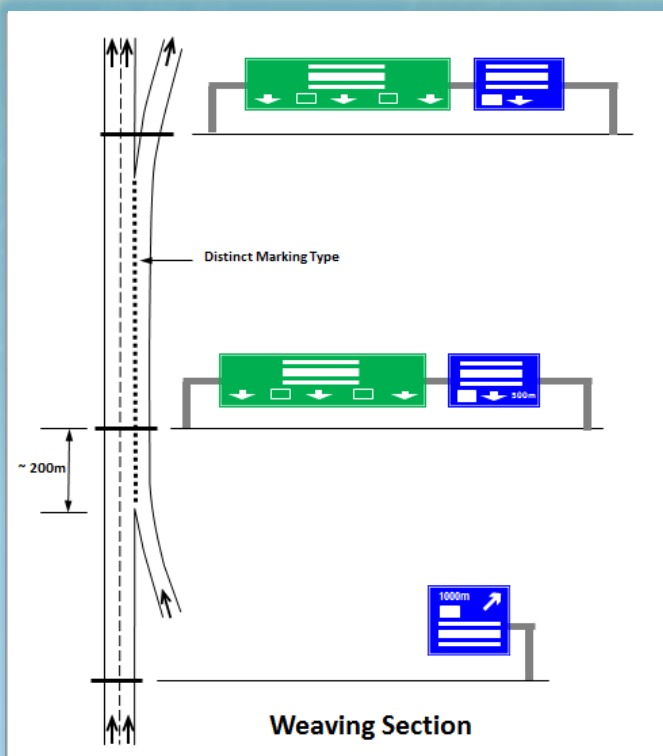
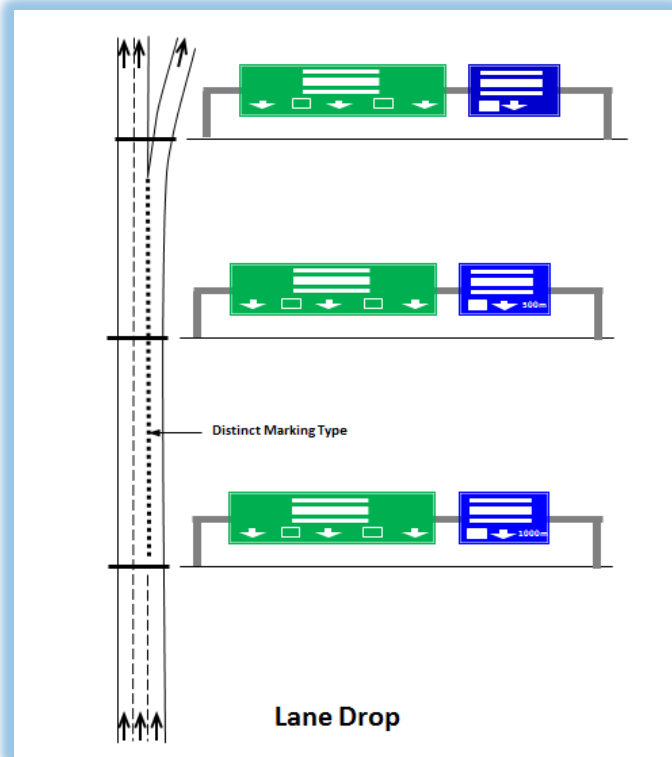
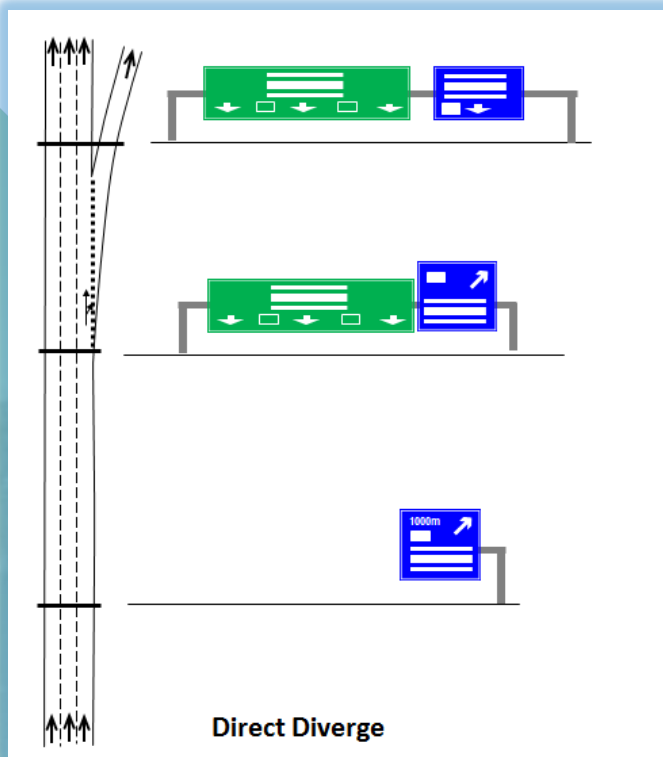


## Flag Type Sign on Single Mast

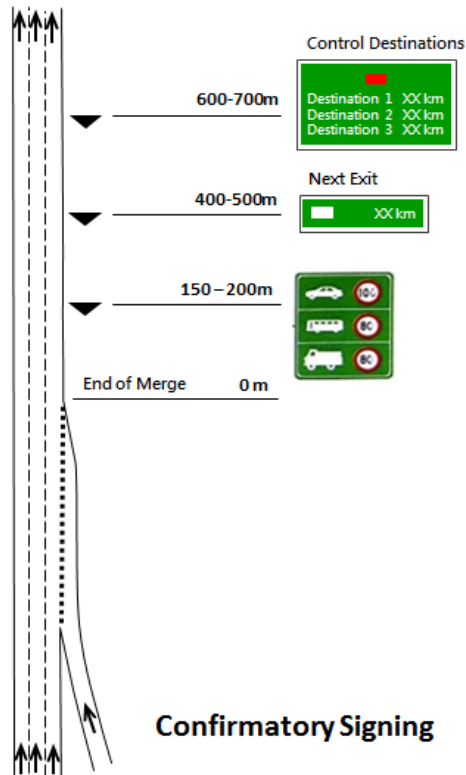
These are used as Direction Sign at the turning point of a junction and are generally mounted on roadside structures. A single mast saves space and is more elegant.



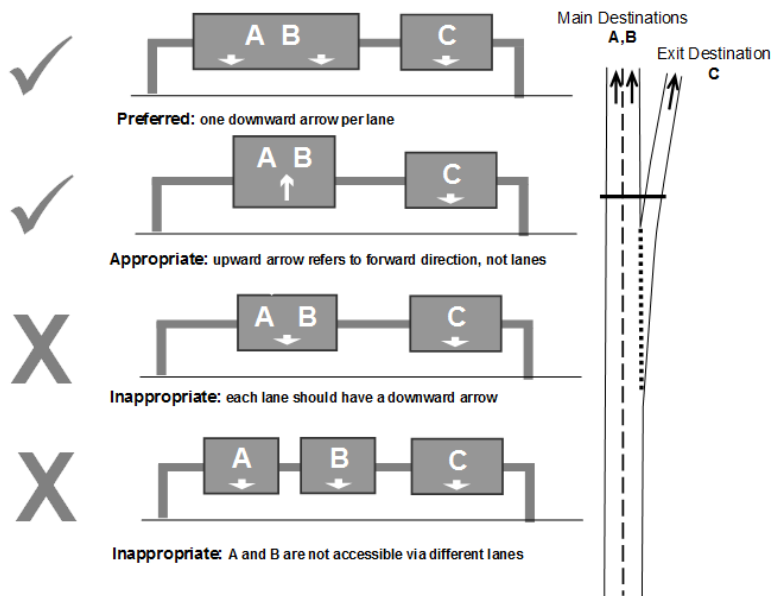
# Basic Sign Sequence and Format



# Basic Sign Sequence and Format



## Clarity of Arrow Usage



# Urban Expressway Systems

## The Characteristics

City development is accompanied by urban expressway systems including flyovers, viaducts, tunnels, underpasses etc. These road systems could involve complex weaving traffic and distance between interchanges is often short.

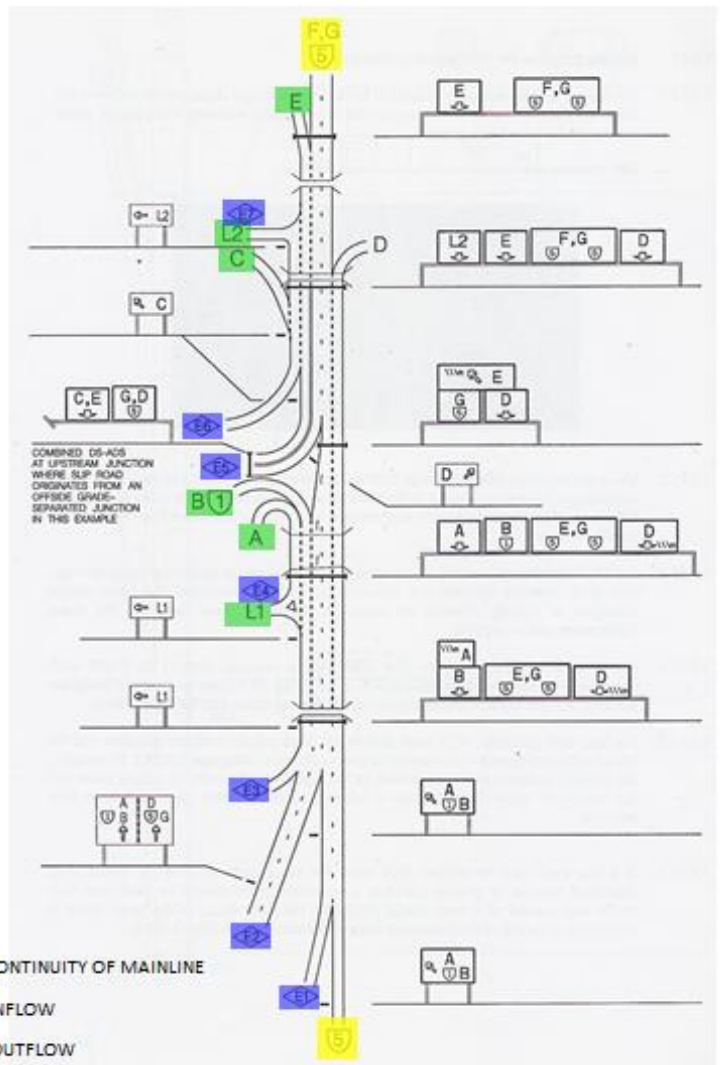
## Need for Special Signing Rules

Directional signing rules for interurban expressways are developed on the basis of long interchange spacing and relatively regular interchange types. Rigidly application to urban expressways could result in overload of information and sign supports with adverse consequences on streetscapes.

## Urban Expressway Signing Rules

Separate guidelines on directional signing for urban expressways will help engineers to design smart and systematic guidance systems. These rules may include:

- ❑ Less number of advance signs and smaller advance distance
- ❑ Sign face for multiple exits ahead
- ❑ Mixed use and optimisation of sign types



*Optimised directional signing for a complex urban expressway system*



# Sign Face Design Rules

## Dual Language Display

Directional signs comprising the national language and English will result in 50% to 70% larger sign face. It is important to fine tune signing standards and design rules to ensure that signs have a balanced appearance and information can be readily accommodated.



source: MUTCD, FHWA

## Texts and Symbols

American signs use more texts whereas European signs use more symbols. Where two languages have to be displayed, more use of symbols could save some space and is more elegant.



source: SES Signalisation

## Compass Direction of Routes

A fundamental decision is whether to display “North”, “South” etc alongside route numbers. These could be beneficial but also add to the complexity of information.



## Placement Order of Destinations

Traditionally nearer destinations are placed on top of farther destinations, but now many European countries position destinations in reverse order.

## Arrows

The UK and France adopt downward arrows on gantries, whereas Germany and Scandinavia use upward arrows. The Netherlands recently decided to use upward arrows which better illustrate double lane exits. The merits and drawbacks of the two approaches need to be well understood.



# Sign Face Design Rules

## Symbols

Symbols are vitally important in the development of signing standards. It is desirable to contain symbols within a standard square box. Proliferation of symbols of different shapes and size could lead to difficulties in sign face design.



source: SES Signalisation

## Interchange and Exit Symbols

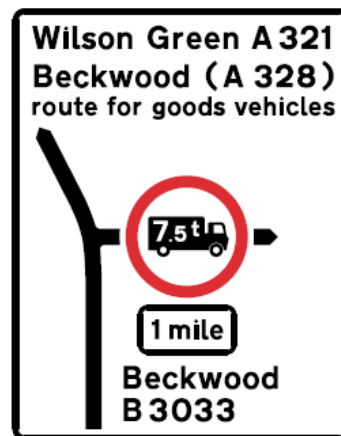
The new European designs are compact and convey information efficiently.



source: Signing Standard of France

## Traffic Signs Symbols

Only a limited set of traffic sign symbols should be permitted. Where forming part of the directional sign face, these are intended for advance information rather than enforcement. Placement of traffic sign symbols on gantry expressway directional signs should be strictly regulated.



source: Traffic Signs Manual Chapter 7, UK

# Gores of High Speed Roads

## The Hazards

Gores on expressways and dual carriageway roads are particularly prone to severe crashes. In general it is not desirable to standardise the placement of directional signs at gores on high speed roads without guarantee of mitigatory measures such as crash cushions, set-back or passively safe sign structures.



source: Mingpao News



source: Google Street View

## “Butterfly” Signs at Gores

This sign type could be a cost-saving option, but their use on high speed roads without guarantee of crash cushion usage could lead to serious road safety problems.

## Clear Zones or Crash Cushions

On rural expressways and high speed roads, clear zones should generally be specified at gores without ground-mounted signs. These are flat, traversable areas free of aggressive features at least 20m in length beyond the physical split of the pavement. Marker signs on frangible, small diameter posts ( $\leq 89\text{mm}$ ,  $\leq 3.2\text{mm}$  thickness) would be acceptable. Crash cushions may also be considered for high risk sites where no other practical solutions could be accommodated.



source: Google Street View