

Traffic Management and Traffic Calming

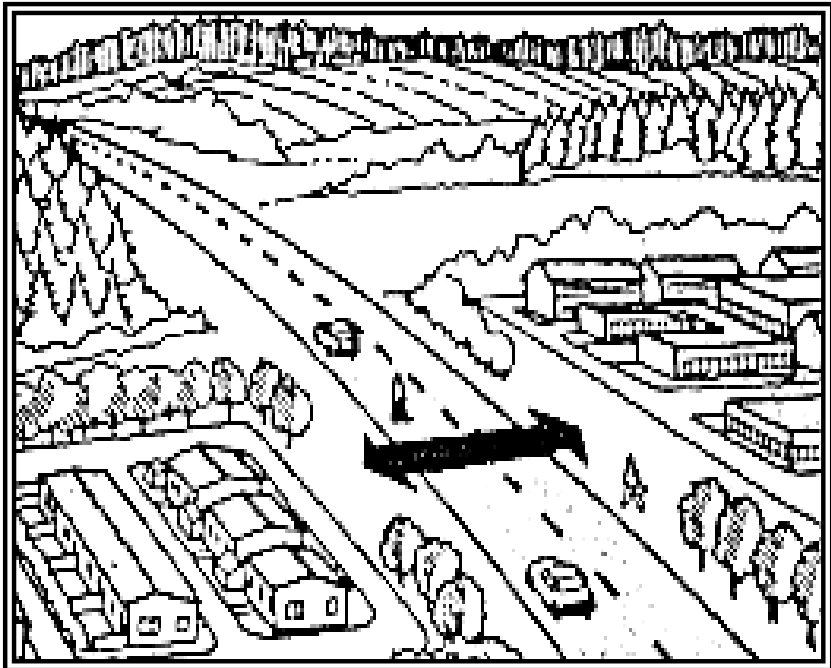
Part - A

LAND USE PLANNING AND ZONING – SAFER PRACTICE

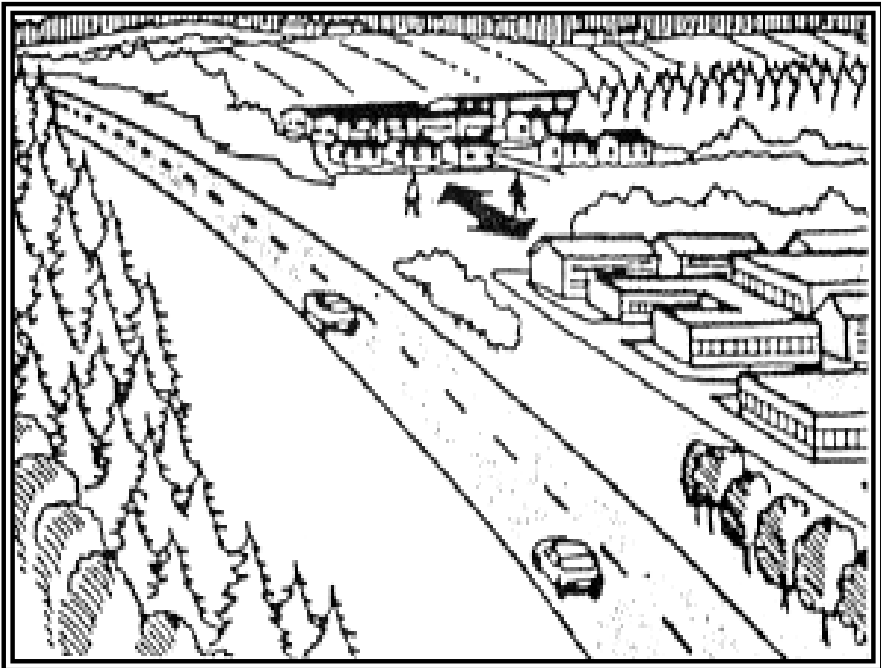
TECHNIQUES

- ◆ *Zoning* e.g. Residential areas separated from heavy industry and major commercial uses,
- ◆ Strong *Planning Regulations* to influence location of new developments and to control access and parking,
- ◆ *Design Residential Schemes for low speeds and light vehicles* with occasional access to heavier service vehicles.

LAND USE PLANNING AND ZONING – SAFER PRACTICE



Split Development



One Sided Development

DEVELOPMENT CONTROL & ENCROACHMENT

- ◆ Roads planned for a particular land-use can become inefficient and *incompatible in case of change in land-use*
- ◆ Existing uses can *outgrow and spread over adjacent sites*



Encroachment of Street by Traders Reducing Available Width Significantly



Encroachment of Footpaths Forcing Pedestrian to Travel on Road



Reduction in Carriageway due to Roadside Encroachment



Encroachment by Street Traders

- ◆ *Unauthorised accesses and ribbon development* along new bypasses can greatly increase accidents.

DEVELOPMENT CONTROL & ENCROACHMENT

Safer Practice

- *Building Regulations* should include *Control of Roadside Development* and *Advertising*.
- Additional action may be needed to *maintain safety if further development* is permitted.
- *Unauthorised development* must be *removed* immediately.
- *Alternative locations* need to be identified *for displaced traders*.
- *Unauthorised access* must *be closed off* immediately.

RIBBON DEVELOPMENT

- Ribbon development *strangles the road system* and creates ugly and blighted spots resulting in congestion.



*Encroachment
and Ribbon
Development*



*Ribbon Development
growing along
Highway*

- *Enormous pedestrian traffic causes serious impediments* to the through traffic on the highway.
- *Local traffic*, of a predominantly mixed character, *claims heavy demand on road space* & gets its major share to the detriment of through traffic emanating from the towns & entering the towns.



*Aerial View of Ribbon
Development Along Highway*

RIBBON DEVELOPMENT



*Ribbon Development
Along Highway*

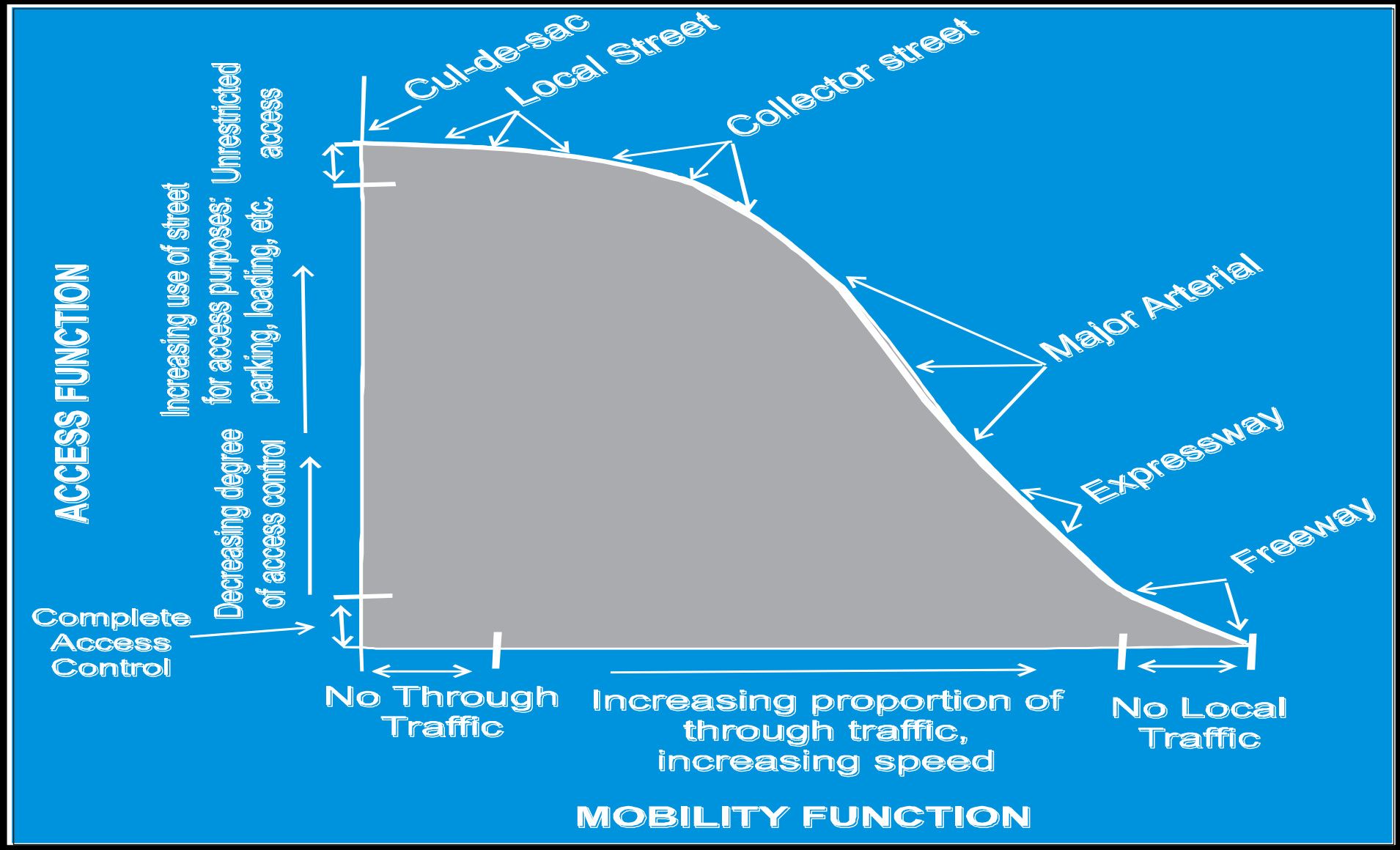


Planned Development

RIBBON DEVELOPMENT – SAFER PRACTICE

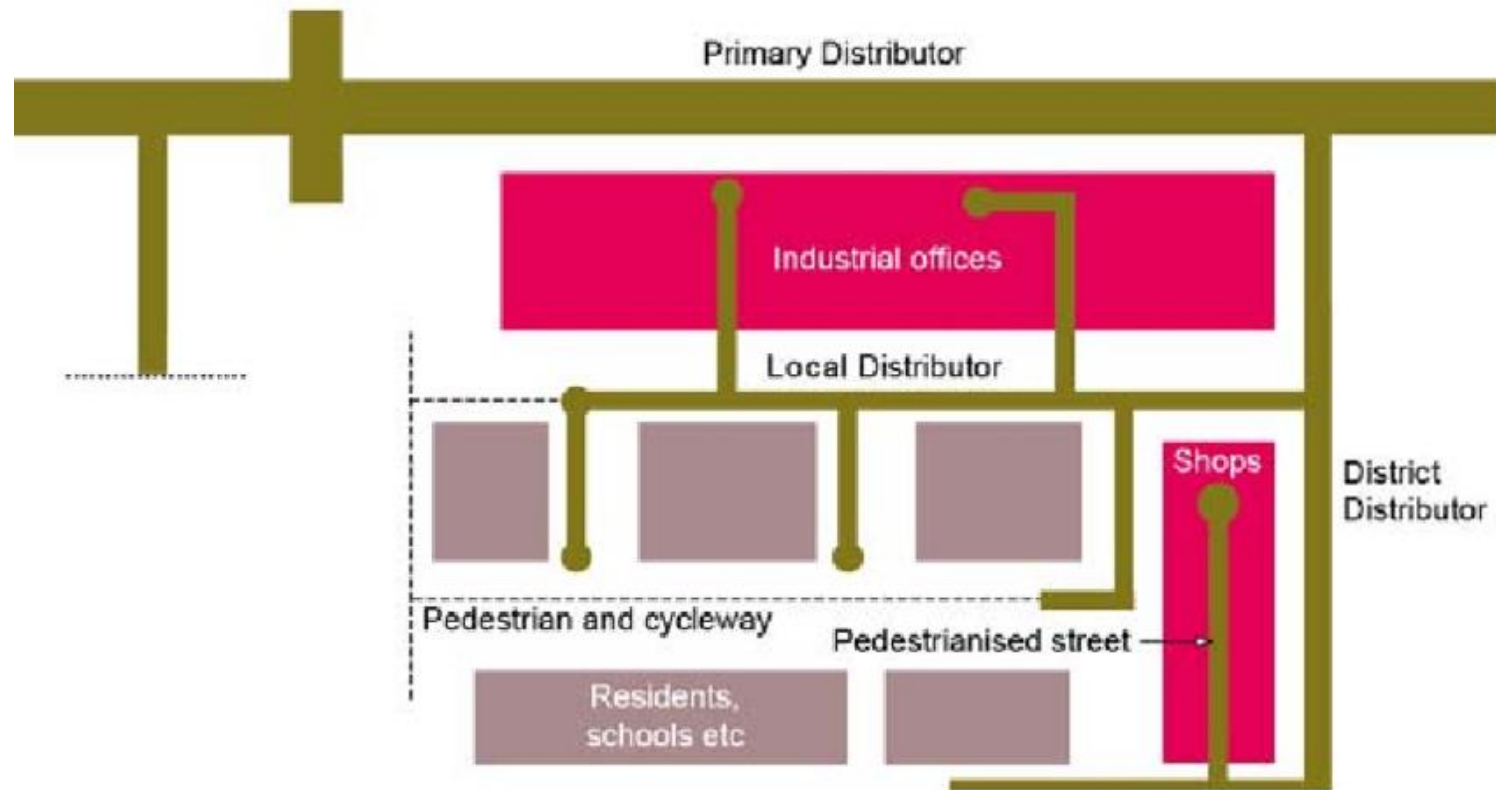
- ◆ *Land acquisition* of adequate highway land.
- ◆ *Land use control* along highways.
- ◆ *Enforcement of building bye-laws* for controlling building lines, set-back distances, control lines etc.
- ◆ *Control of sub-division of land* abutting highway land.
- ◆ *Control of access and roadside development.*

NETWORK HIERARCHY – ISSUES



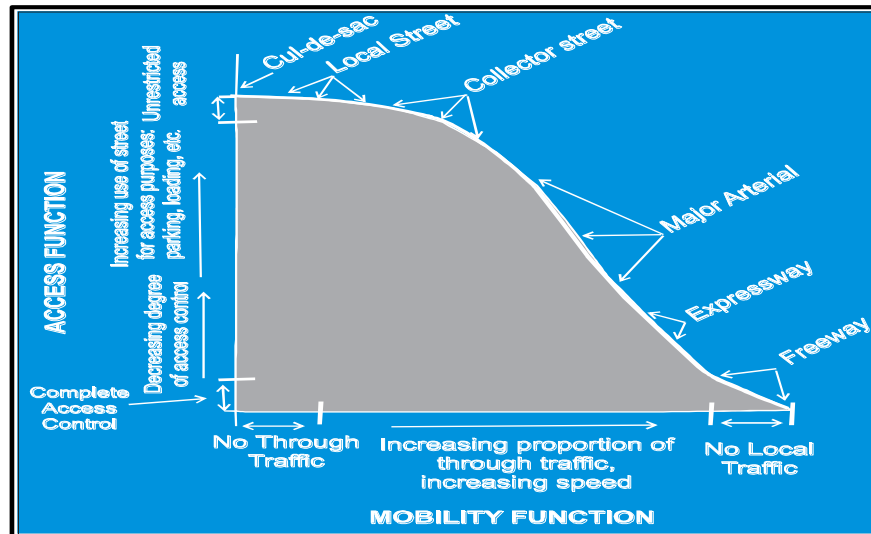
NETWORK HIERARCHY – ISSUES

Schematic Figure of Road Hierarchy

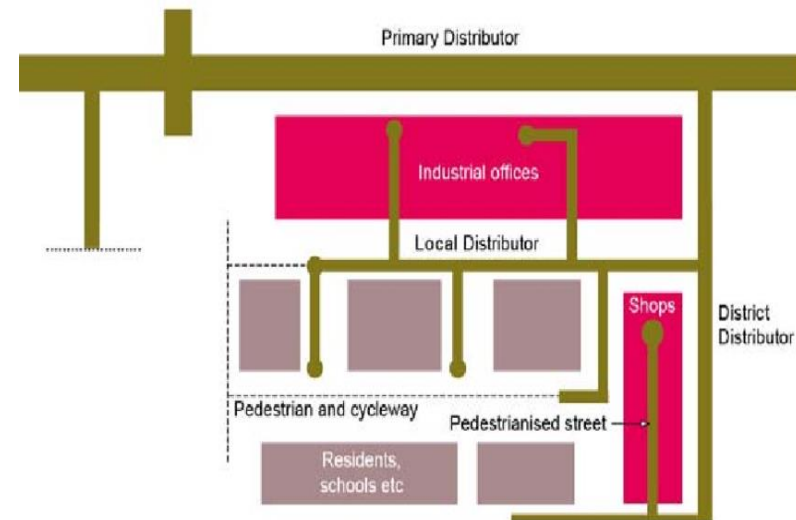


NETWORK HIERARCHY – ISSUES

Schematic Relationship between Access and Movement Functions of Roads



Schematic Figure of Road Hierarchy



No categorization into hierarchy leading to –

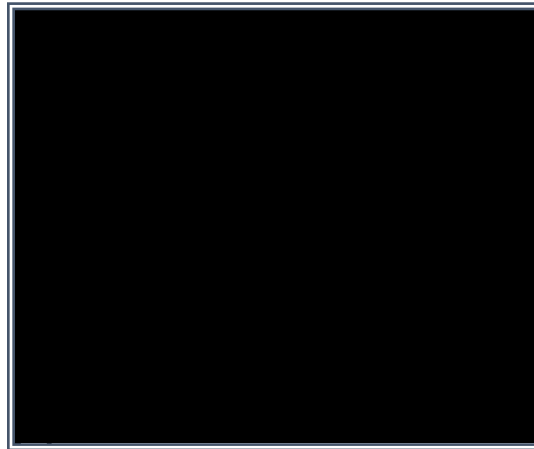
- Lack of hierarchy
- Unsafe grid layouts
- Unrestrained development
- Poor residential road layout

NEED FOR

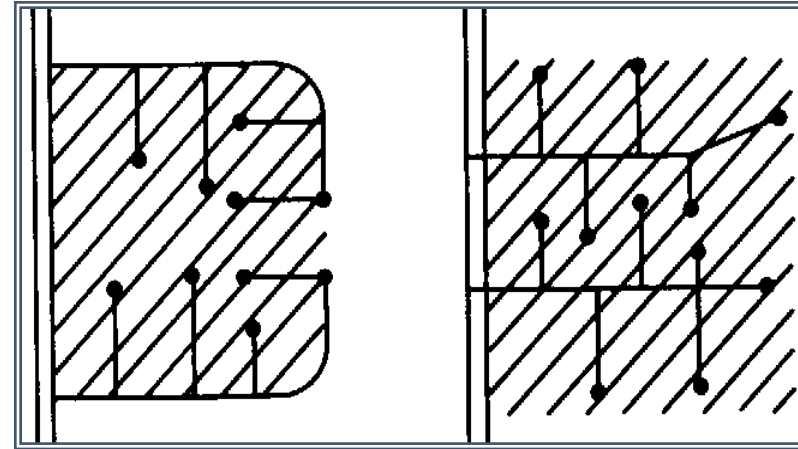
- *Land-use & traffic control*
- *Segregate incompatible uses*
- *Design networks*
- *Land use planning*

SAFER PRACTICE

- ◆ **Zoning** e.g. Networks should be self-contained zones to exclude extraneous traffic.
- ◆ **Natural barrier** of main routes used to segregate and contain incompatible uses.
- ◆ **Appearance and design standards** to convey role of road and include appropriate speeds of traffic.
- ◆ Roads should only **intersect with roads of same level or one level higher or lower** in the hierarchy.



*Grid Iron System of Roads
have more Conflict Points*



*Externally and Internally Fed Network which
Separate Access and Movement Functions*

ROUTE PLANNING THROUGH COMMUNITIES - ISSUES

- ◆ *Little consideration given to effects of upgrading or new construction* resulting in -
 - Speed-related problems
 - Poor development control leads to conflict, congestion & danger to through & local traffic
- ◆ *Opportunities are rarely taken to downgrade old roads* for local functions and activities.

SAFER PRACTICE

WHERE BYPASSES CAN BE JUSTIFIED

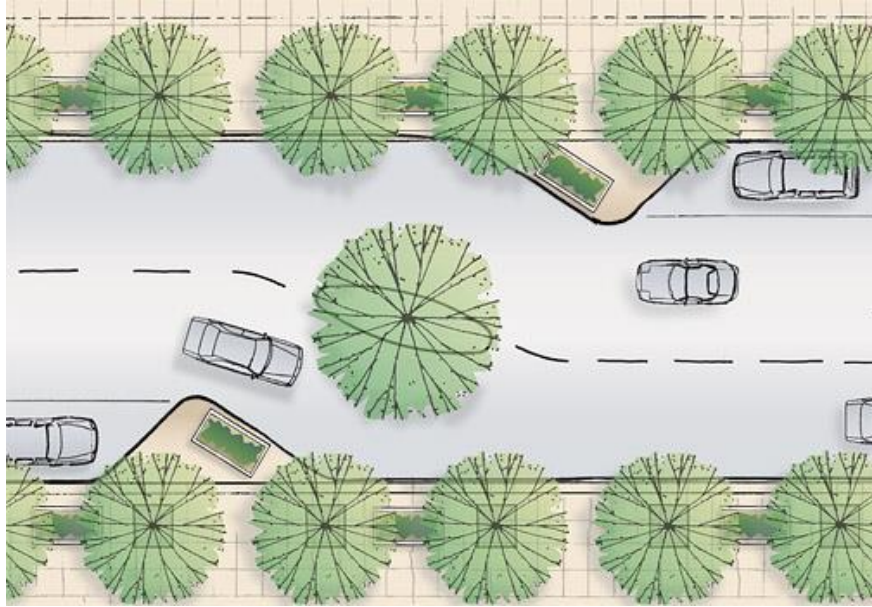
- *Downgrade* old road.
- *Provide only a few links* preferably via spur roads.
- *Prohibit direct access* onto new road.
- *Leave provision for future expansion* of community

WHERE BYPASSES CANNOT BE JUSTIFIED

Traffic calming techniques:

- *Rumble strips on approaches*
- *Gateways or road narrowings*
- *Chicanes or road humps*

Traffic calming techniques



Traffic calming techniques



Additional Resources

<https://www.pps.org/article/livememtraffic>

<https://globaldesigningcities.org/publication/global-street-design-guide/designing-streets-people/designing-for-motorists/traffic-calming-strategies/>

Traffic Management and Traffic Calming

Part - B

ACCESS CONTROL – ISSUES & SAFER PRACTICE

Uncontrolled and unauthorized access at unsuitable locations

SAFER PRACTICE

- ◆ *Key planning principles to consider are:*
 - Number of intersections should be minimised, junctions simplified, and service roads provided,
 - Traffic should work up through hierarchy of roads
 - Priority always to road higher in hierarchy.
 - Stop or give way markings / signs where they meet major road.
- ◆ *Introduce control system* for developers to get permission to access onto public roads.
- ◆ *Small full-time development control team* needed to assess/review access proposals
- ◆ *Access roads to parking areas of major facilities* (hospitals, shopping centres etc) to be *at least 50-100m from junctions.*

TRAFFIC SEGREGATION – ISSUES & SAFER PRACTICE

- ◆ Unprotected pedestrians and non-motorised vehicles
- ◆ Differences in traffic speeds increases the risk as well as the severity of accident.
- ◆ Lack of continuity of cycle-tracks at the junctions.
- ◆ Accident occur due to incompatible types of traffic on road.

SAFER PRACTICE FOR TRAFFIC SEGREGATION

- ◆ Motor vehicle traffic from pedestrian,



Pedestrian Segregated from the Traffic and the Barrier Provided to Restrict the Entry of Vehicles



Good Practice of Vehicle – Pedestrian Segregation

- ◆ Motor vehicle traffic from cyclist,
- ◆ Motor vehicles from slow moving traffic,
- ◆ Public transport.

TRAFFIC SEGREGATION – ISSUES & SAFER PRACTICE

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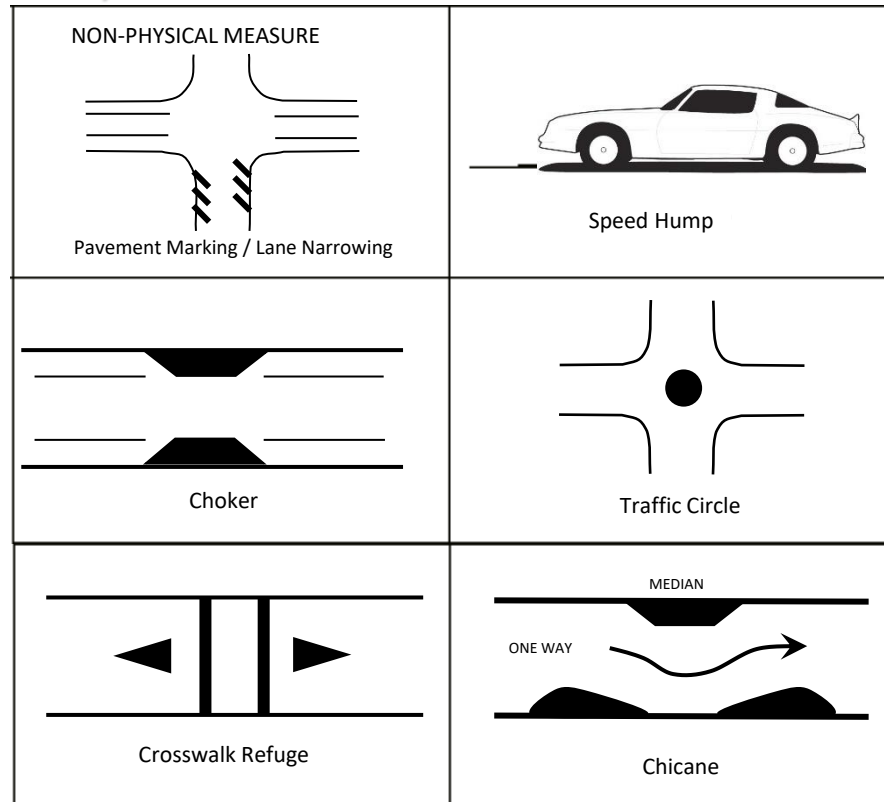
TRAFFIC CALMING – ISSUES & SAFER PRACTICE

Reduction in vehicles speeds reduces the likelihood of accidents happening and helps reduce pedestrian accident severity

(At 30kmph : 5% die, at 60kmph: 85% die)

SAFER PRACTICE

- Vertical deflections : Speed breakers, humps, cushions, and rumble strips,
- Horizontal deflections : Road narrowings and chicanes,
- Mini-roundabouts
- Entry treatments with speed limits and signing
- Pedestrian facilities
- Landscaping
- Road closures.



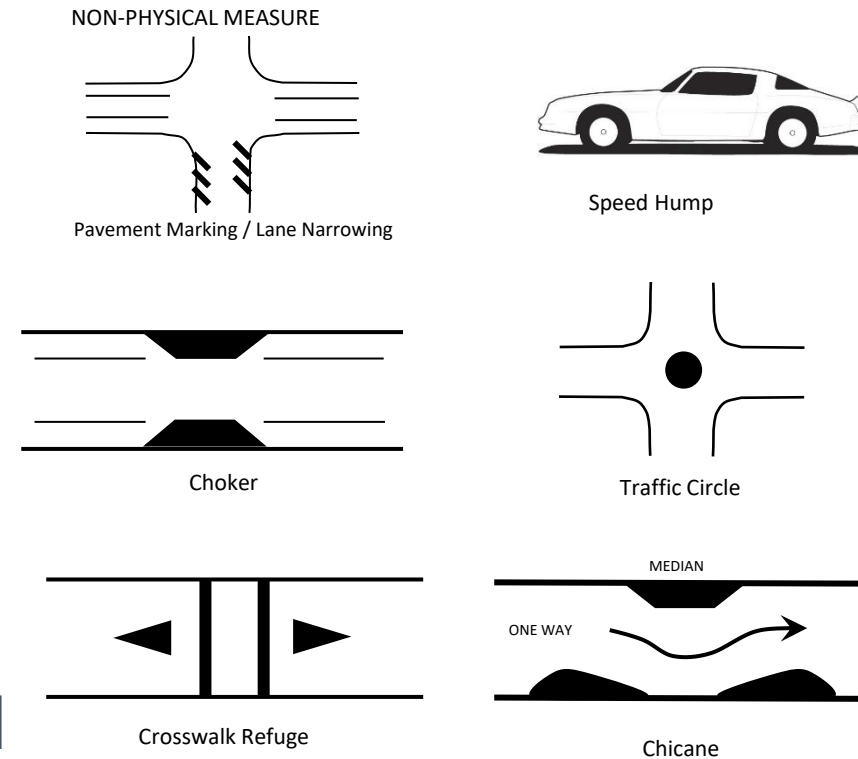
Physical & Non-physical Traffic Calming Measures

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Road narrowings and chicanes,



Physical & Non-physical Traffic Calming Measures

ROAD SAFETY THROUGH NON-ENGINEERING MEASURES

Performance and behavior analysis is a better tool to examine road user education critically

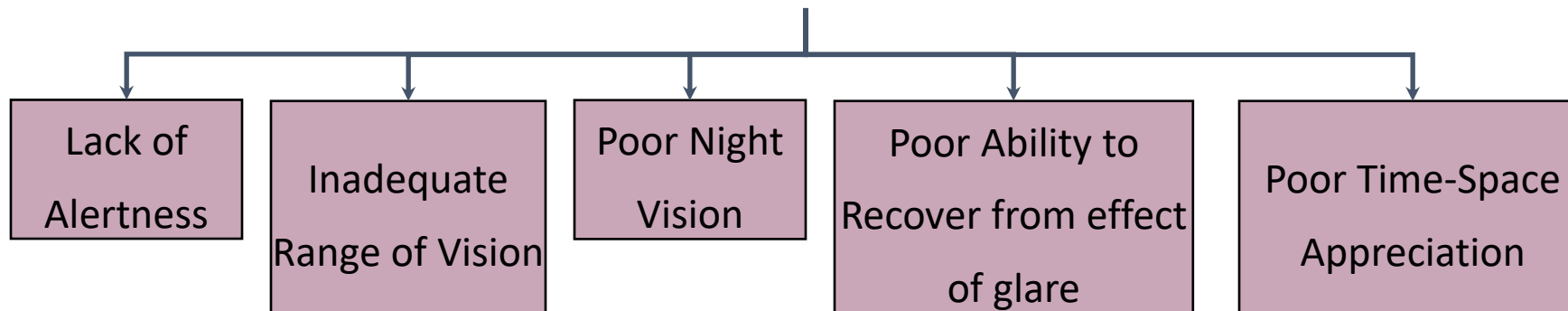
DRIVERS' BEHAVIOR

- Accident data /convincing theoretical arguments for relationships between behavior and road safety.
- Change driver behavior accordingly

CHILDRENS' BEHAVIOR

- Ways that would improve perception, behavior and choice for safe situations
- Alter behavior with counter measures like education, training and publicity

PSYCHO-PHYSICAL FACTORS RESPONSIBLE FOR BEHAVIOR



ROAD SAFETY THROUGH NON-ENGINEERING MEASURES

EDUCATION, TRAINING & PUBLICITY

- *Training programmes*

- Targeted at specific types of road user or age group.
- Designed to develop the practical skills

- ◆ *Publicity campaigns*

- Use of media, leaflets and advertising to inform & advise road users.
- Only way to reach wider audience and adults, in particular.

ROAD SAFETY THROUGH TRAINING PROGRAMMES

◆ TARGETED GROUPS – DRINKING DRIVERS

- Successes of reducing drink driving & alcohol-related crashes combining public education with tightly-enforced legislation.
- The education helps to:
 - build support for laws and their enforcement,
 - to explain what the laws mean,
 - to maintain a high visibility for the laws

◆ TARGETED GROUPS - HEAVY VEHICLES DRIVERS

- The demands/skills necessary are different and more complex
- Target to reduce the time and increase the probability of acquiring skills associated with lower accident risks; and
- Improve on the accident free driving by developing safety skills already attainable or through extra safety skills.

ROLE OF TRAFFIC POLICE IN ROAD SAFETY

◆ *Role of Police in Traffic Control*

- Eliminate injuries and loss of property due to vehicles
- Facilitate the safe & rapid movement of vehicles & pedestrians,
- Reduce inconveniences, dangers and economic losses, congestion, delay, stopping and parking of vehicles

◆ *Role of Police in Engineering*

- Build safety and facility into the highway system with -
 - Large-scale, long-range planning
 - Construction of major improvements in street & highway system
- An integral part of the traffic control programme.

◆ *Role of Police in Traffic Education*

- Improve habits of safety among individual drivers, pedestrians, and school children.

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ROLE OF NGOs IN ROAD SAFETY

- ◆ NGOs can *assist and influence* government through -

- Direct interface with government & legislation at central & local levels
- Provision of services
- Ownership & management of assets
- Interaction with the media and through direct action



- ◆ *World Bank identifies the need* of the support of the society including the NGOs.
- ◆ *NGOs and institutional participation can be divided into:*
 - Educational, advisory, in partnership or delegated powers
- ◆ Non-Governmental participation must be *channelised through a dedicated multi-disciplinary authority.*
- ◆ Example: Federal Republic of Germany was provided in 1969 by the creation of German Traffic Safety Council

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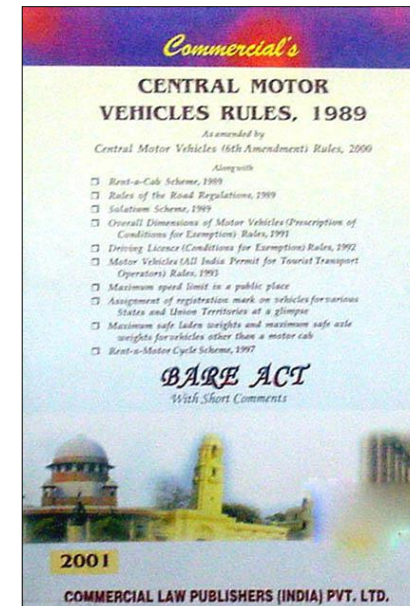
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LEGAL FRAMEWORK FOR ROAD SAFETY

- ◆ The *Motor Vehicles Act (1988)*, *Central Motor Vehicle Rules (1989)* & *Motor Vehicle Rules* of the State provide the overall legal framework
- ◆ Any legal instrument must *conform to provisions and guidelines given by Constitution with regard to Citizen's Rights*, Power Delegated to Local authorities, Union & State Lists as well as *Human Rights &* International Treaties.
- ◆ Not enough police resource to enforce all the laws to the satisfaction of the public.
- ◆ *The laws regulating the use of alcohol, safety equipment & driving speeds have a key role in decreasing traffic fatality rates*



QUESTIONS

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