“Our Safe Right Of Way”

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Centre for Science and Environment

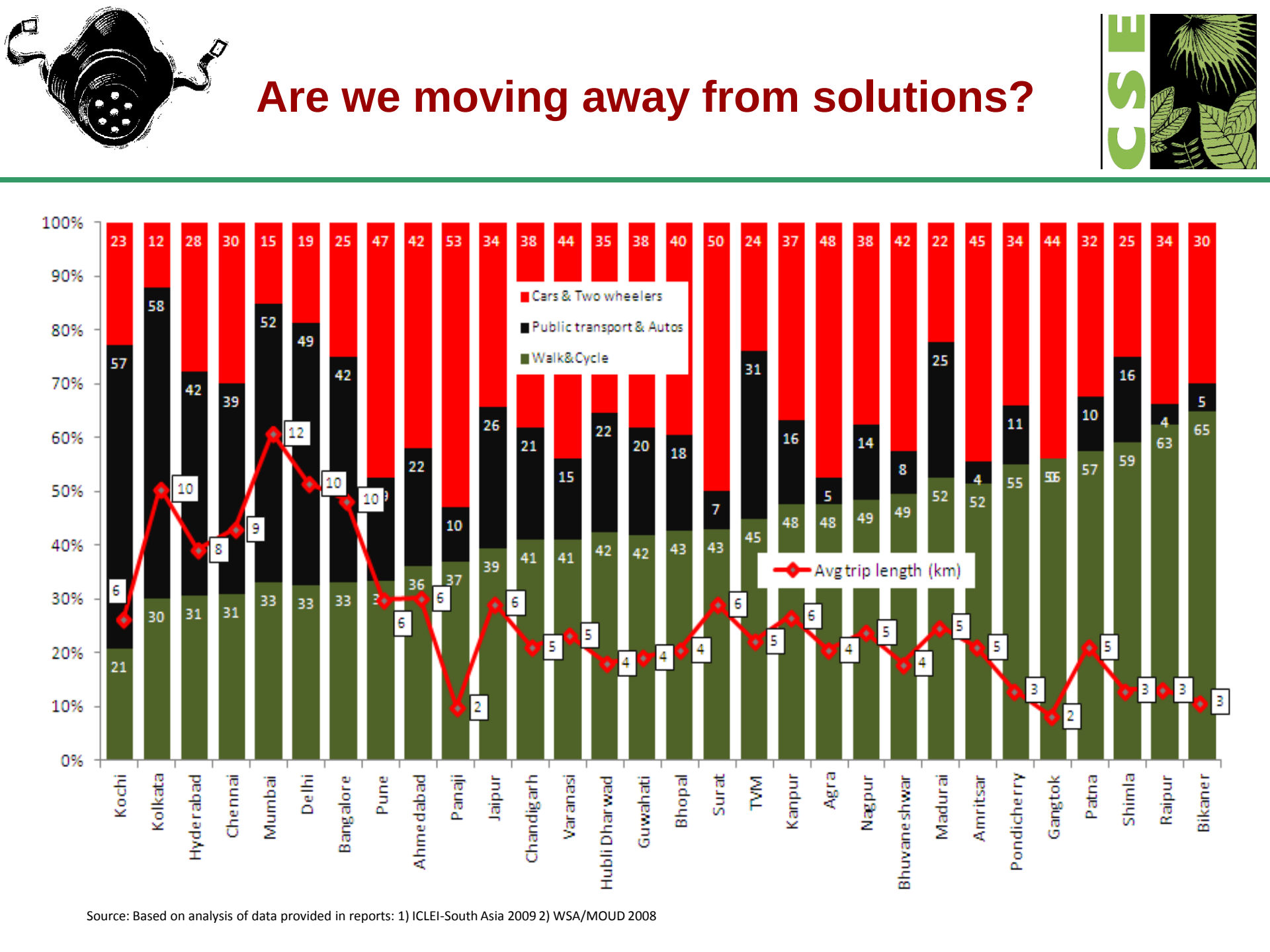
Safe Access and Parking Strategies for Liveable cities

Kolkata
February 16, 2017

Challenge of the car bulge

Delhi: November, 2016……

Are we moving away from solutions?



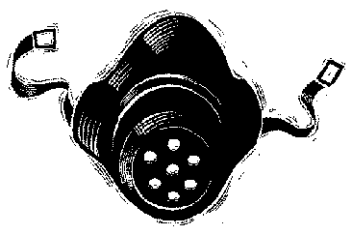
Source: Based on analysis of data provided in reports: 1) ICLEI-South Asia 2009 2) WSA/MOUD 2008

Cost of delay…

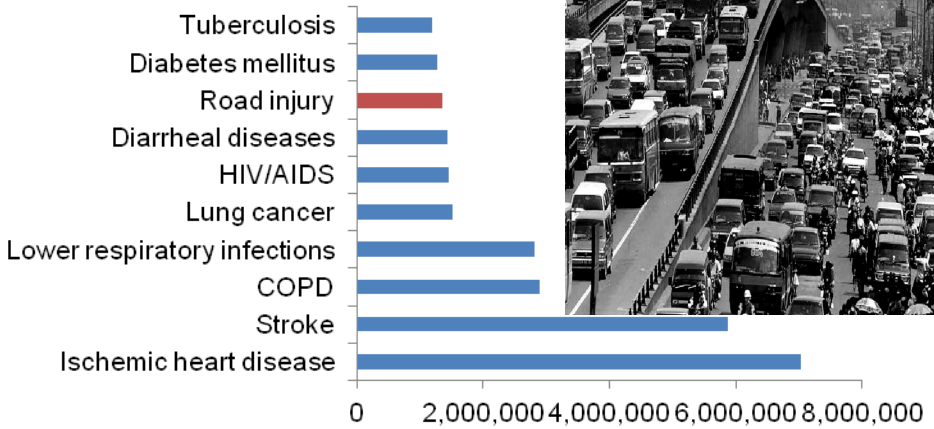
Arterial Roads	Corrid-or Speed	Length of Road	PCUs at Morning Peak	PCUs in Evening Peak	Total Time Loss (Hours)	Value of Time Lost (Rs.)
Vivekananda Road	40	1.2	1202	1768	17.82	338.58
Chittaranjan Avenue	25	4	2028	2112	331.2	6292.8
Mahatma Gandhi Road	9	3	1507	1599	848.97	16130.49
R. G. Kar Road	18	2	1397	1415	199.96	3799.32
Acharya Jagadish Chandra Bose Road	18	6	1915	1851	803.41	15264.85
Jawaharlal Nehru Road	25	3	2237	2246	268.98	5110.62
Lenin Sarani	20	2	1042	1225	136.02	2584.38
Deshapran Sashmal Road	15	2	1693	1848	330.49	6279.37
Raja Subodh Mallick Road	16	4	2678	2487	878.05	16682.95
Jatindra Mohan Avenue	20	1	1390	1407	83.01	1594.29
Total			17089	17958	3898.82	74077.66

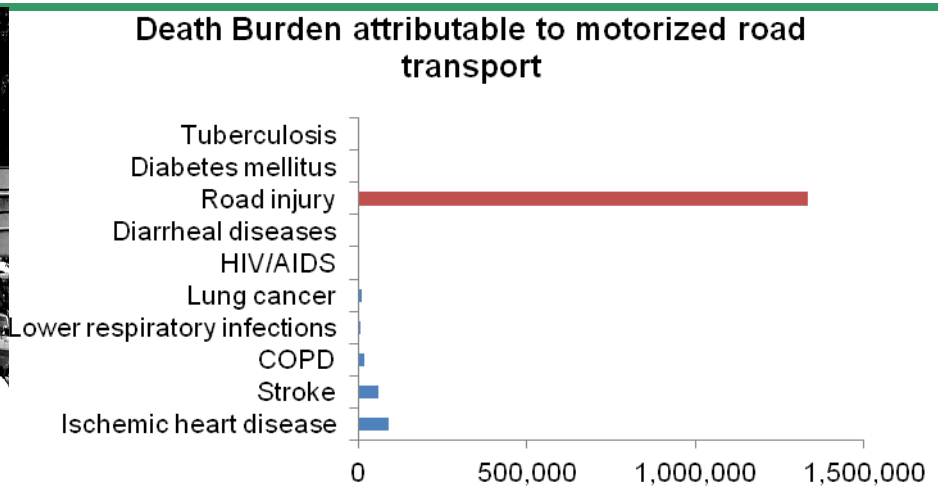
Source: Centre for Urban Economic Studies, University of Culcutta, Kolkata

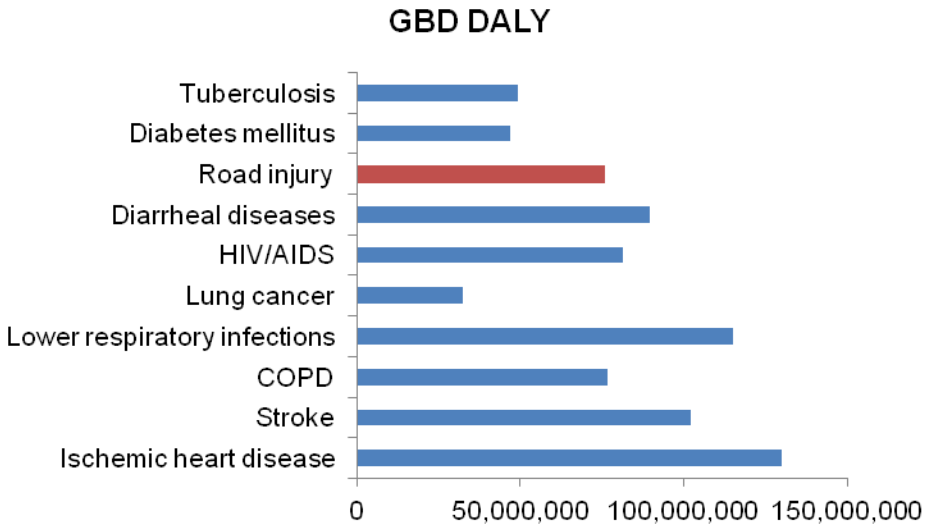
- Rs. 74,077.66 lost in only two hours (i.e. 9 - 10 a.m. and 6 – 7 p.m.) in a day on selected roads.
- Annual loss as much as Rs. 2, 66, 67,957.6.

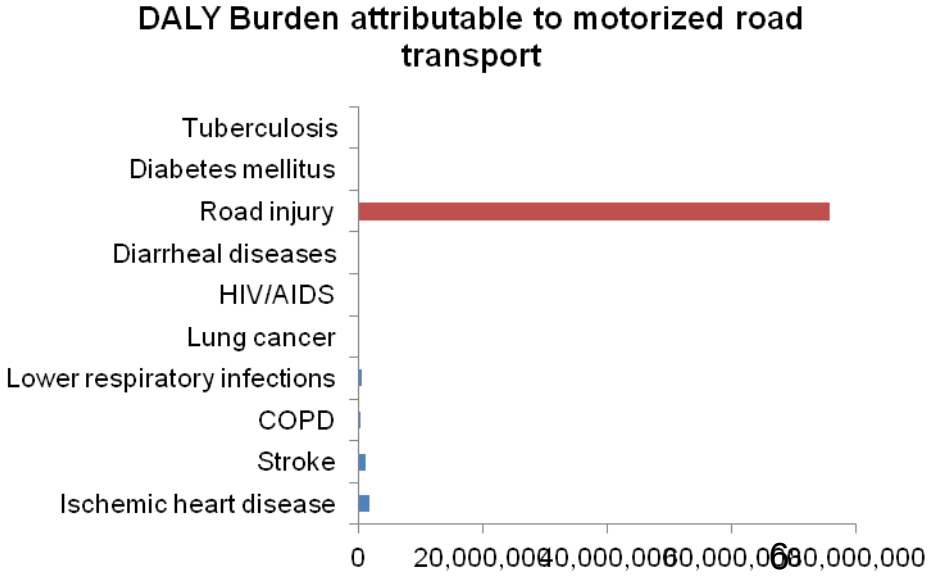


Global Burden of Disease changed the way we understand health impact of motorisaton Combined burden of road injury and deaths and illness

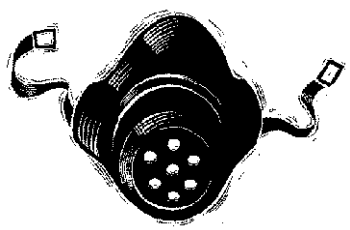






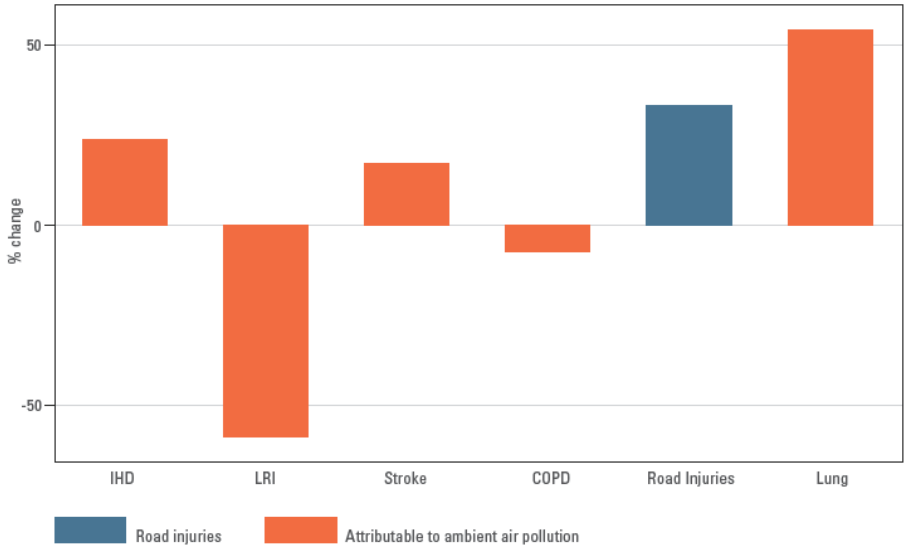


Source: Global Burden of Diseases 2010 Study, Leading causes of death worldwide, associated DALYs, and burden attributable to motorized road transport, 2010

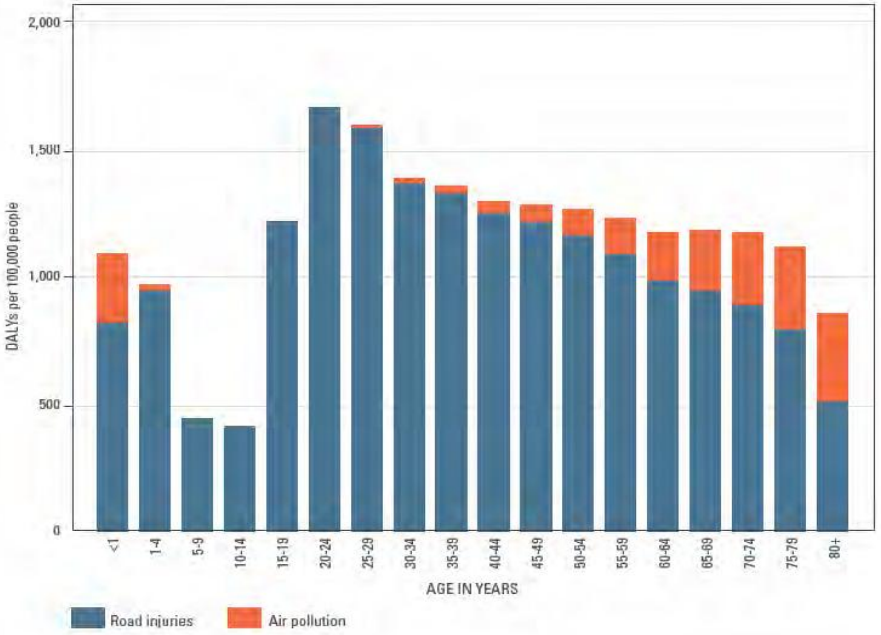


Dramatic change in burden of disease from air pollution and road injuries

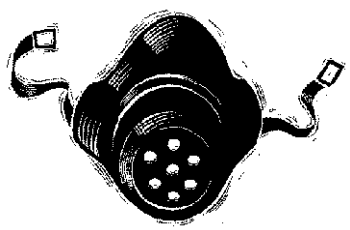
Global shifts in healthy years lost due to road injures and outdoor air pollution from 1990-2010



Rate of health years lost to injuries and air pollution from motorized road transport 2010

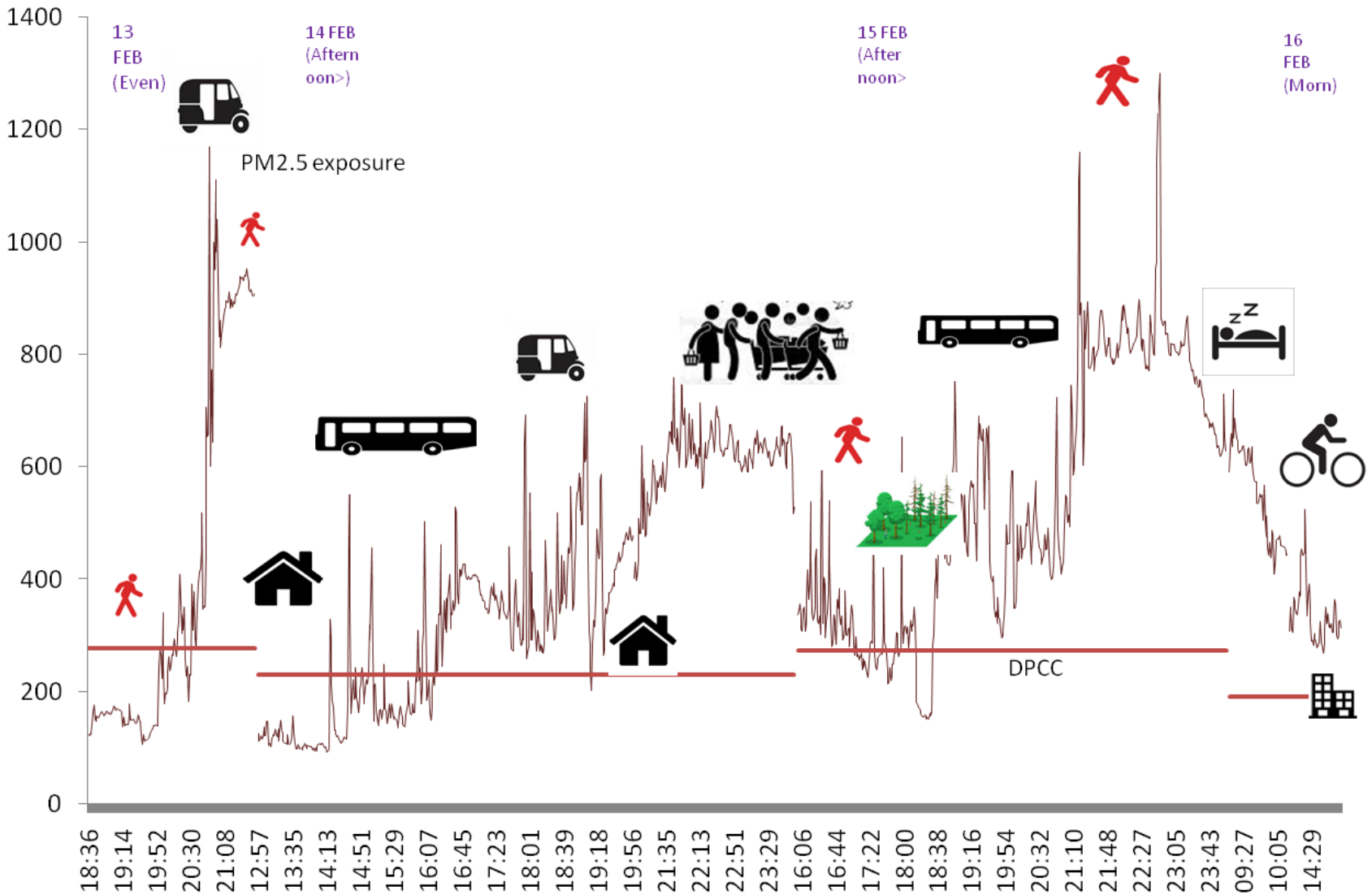


Source: The World Bank Group and , Global Road Safety Facility



How much pollution we breathe on road?

Average exposure to PM2.5 ranged between 192 to 642 micrgramme per cum. Peaks as high as 457 to 1170. The average ambient level ranged between 191 to 277.

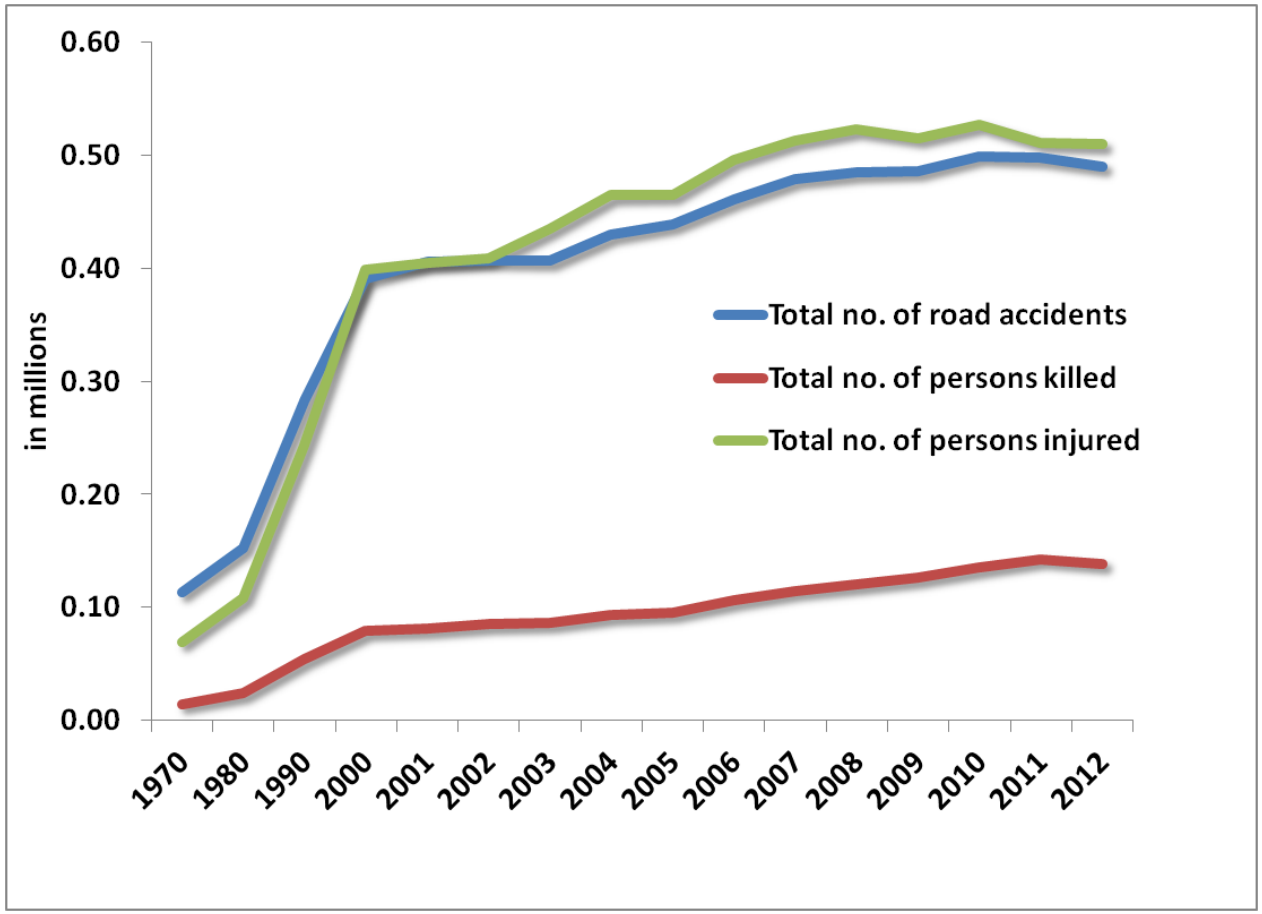


Source: Based on CSE exposure monitoring and DPCC data for ambient levels

India: a major accident hotspot

Deadly tally: 16 deaths and 58 road injures every hour in India….

This is equivalent to wiping out about 40% of population of Maldives in a year.

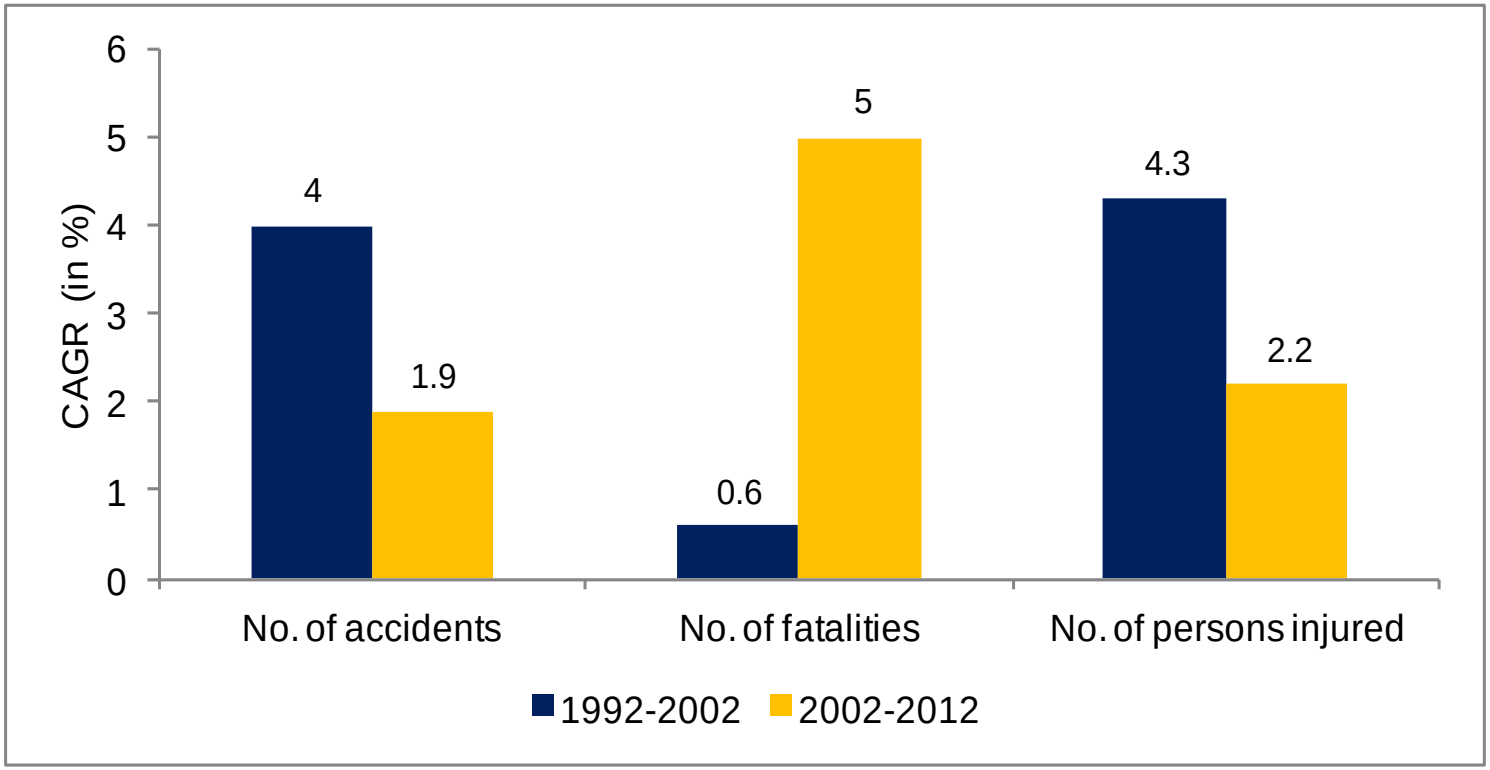


Source: Anon 2013, *Road Accidents in India 2012*, Ministry of Road Transport and Highways, Government of India, New Delhi, p 1

Sharp increase in fatality rate in India

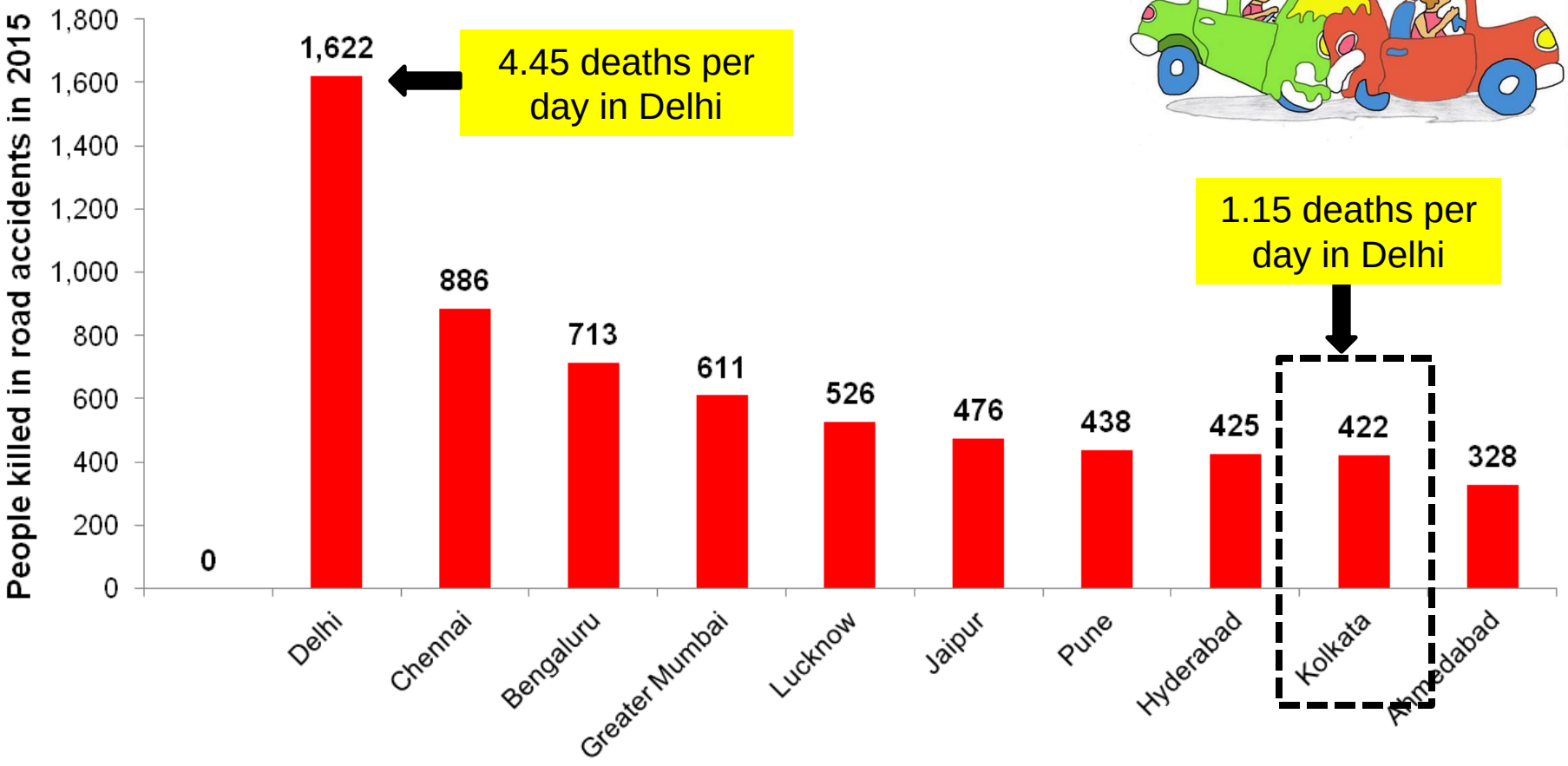
-- In the last two decades the total number of accidents and injury has declined. But fatalities increase sharply.

-- Since 2003, the proportion of fatal accidents in total road accidents has up from 18.1% to 25.1% in 2012.



Source: MORTH 2012

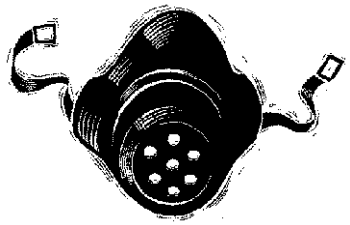
People killed in road accidents in 2015



Source: MoRTH, 2015, http://morth.nic.in/showfile.asp?lid=2143

Pedestrians and cyclists in danger….

• According to 2015 report of National Crime Records Bureau, out of 53 mega cities, Kolkata (192 deaths) reported highest cases of road accidents at pedestrian crossing.

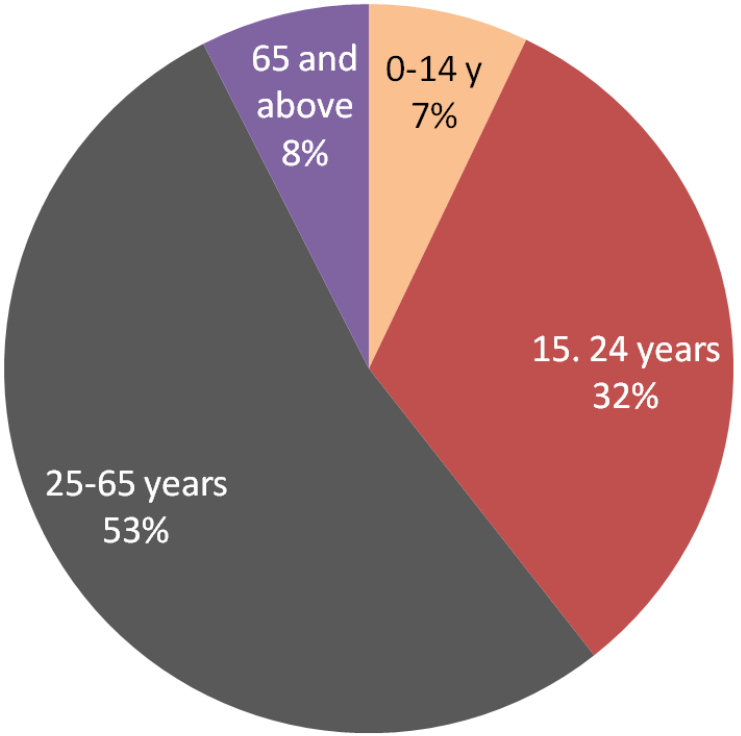


The young….

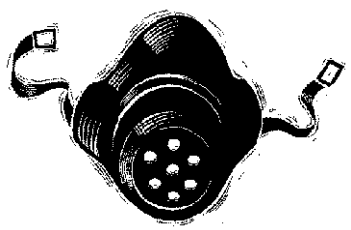
Nationally, young population in the age group 0-24 years constitute 40% of victims, (other than drivers).

Most affected victims in their most productive phase of life – 25-65 years. As much as 53% of the victims

Age profile of road accident victims (other than drivers)



Source: MORTH 2012

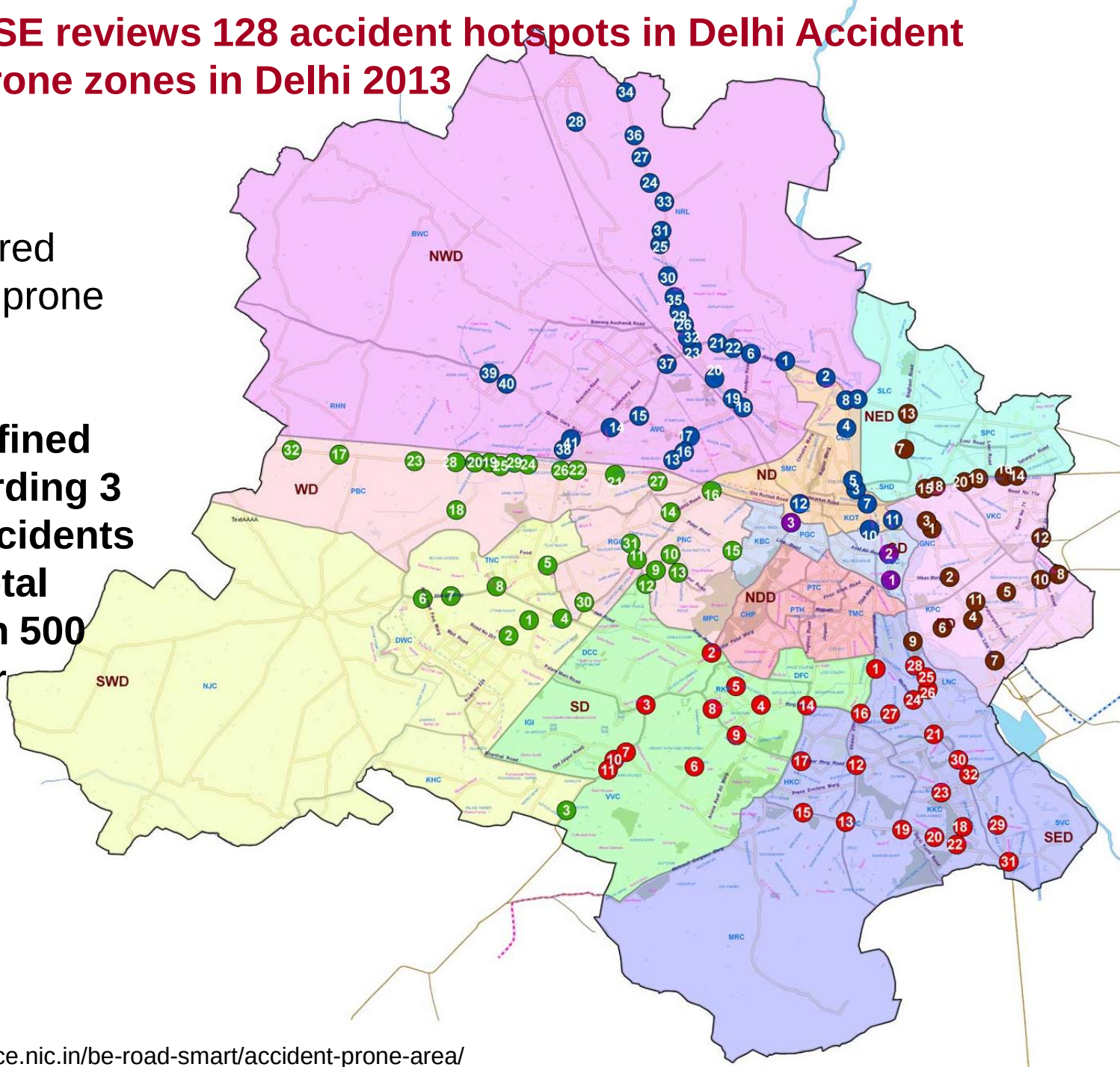


Lessons from Delhi……

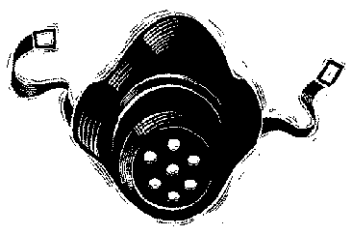
CSE reviews 128 accident hotspots in Delhi Accident prone zones in Delhi 2013

Traffic police shared data on accident prone zones

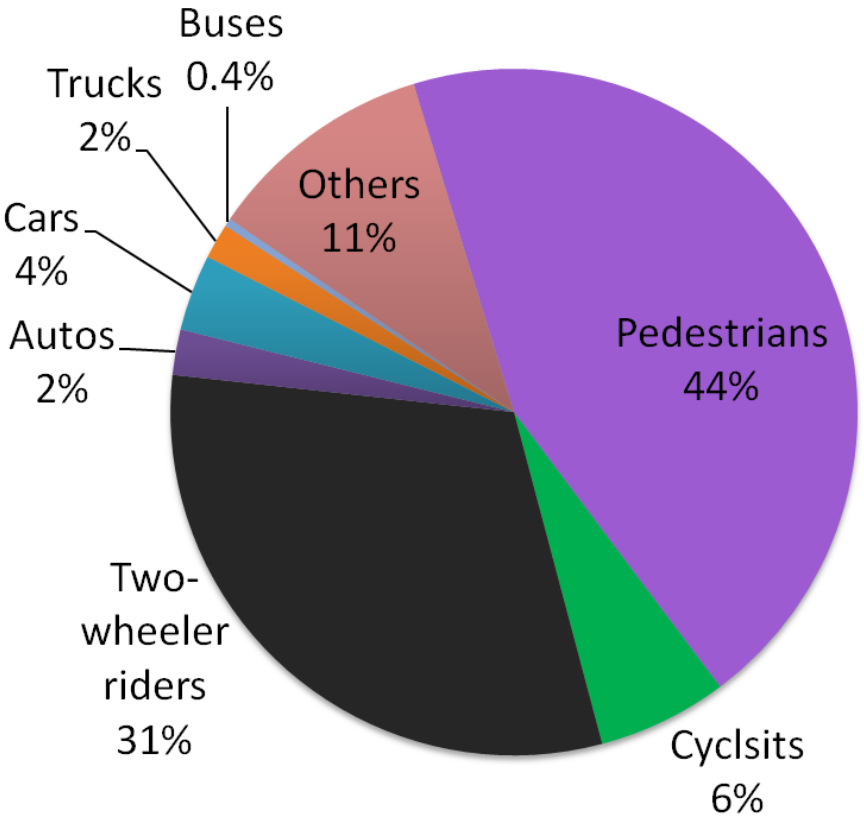
A hot spot is defined as an area recording 3 or more fatal accidents or 10 or more total accidents within 500 meters diameter



Source: http://delhitrafficpolice.nic.in/be-road-smart/accident-prone-area/



Who is vulnerable…?

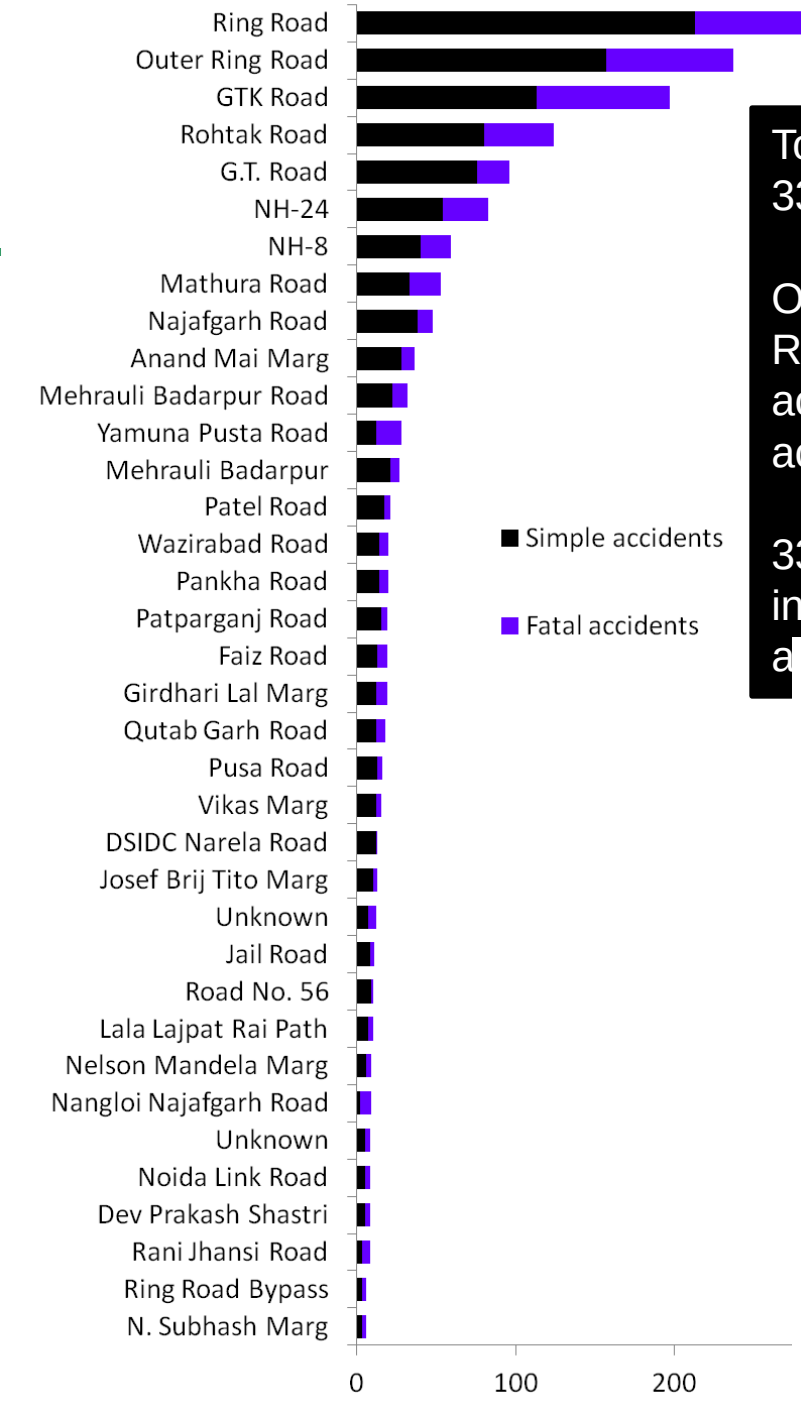


Pedestrians are most vulnerable – pedestrian and cyclist together are 50% of the victims

Urban villages and low income areas do not generate motorized traffic but suffer the most: These neighbourhoods face modal conflict and friction considerably. Some of the notorious accident hotspots are near Ali Village, Shakarpur Chungi etc, with a total share of 10 per cent.

Source: MORTH 2012

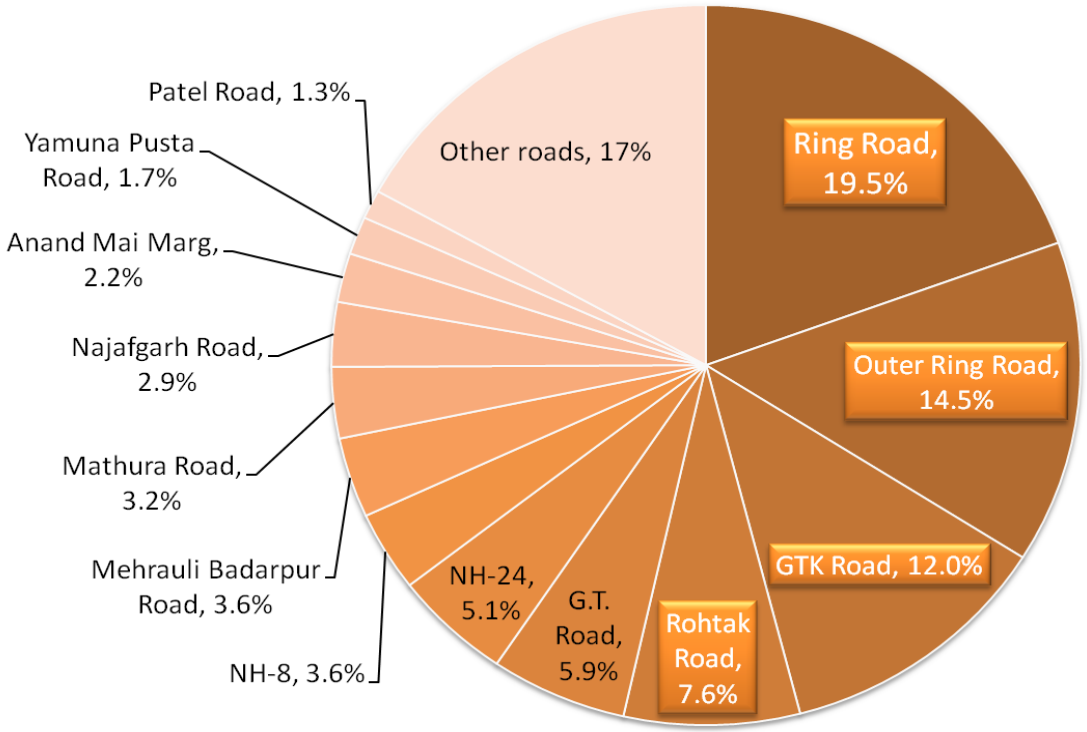
Deadly roads….



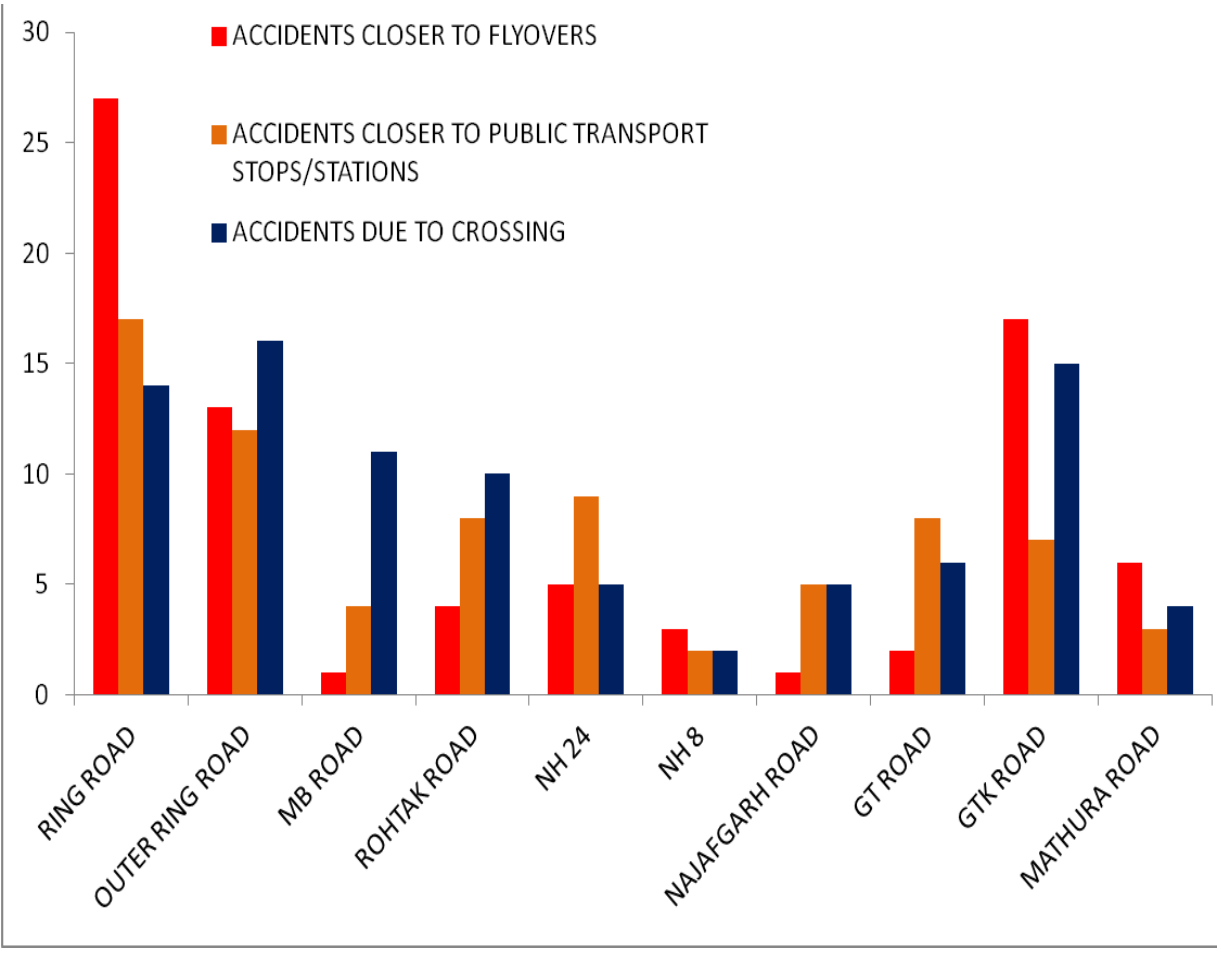
Total 1638 accidents recorded in accident prone roads, 33% of these were fatal accidents

Only 8 roads -- Ring Road, Outer Ring Road, GTK Road, Rohtak Road, G.T. Road, NH-24, NH-8 and Mathura Road account for about three-fourth of total accidents and fatal accidents

33% were fatal accidents. Nearly 20% of all accidents occur in Ring Road. Outer Ring Road and GTK Road have 14% a



Where are most accidents happening?

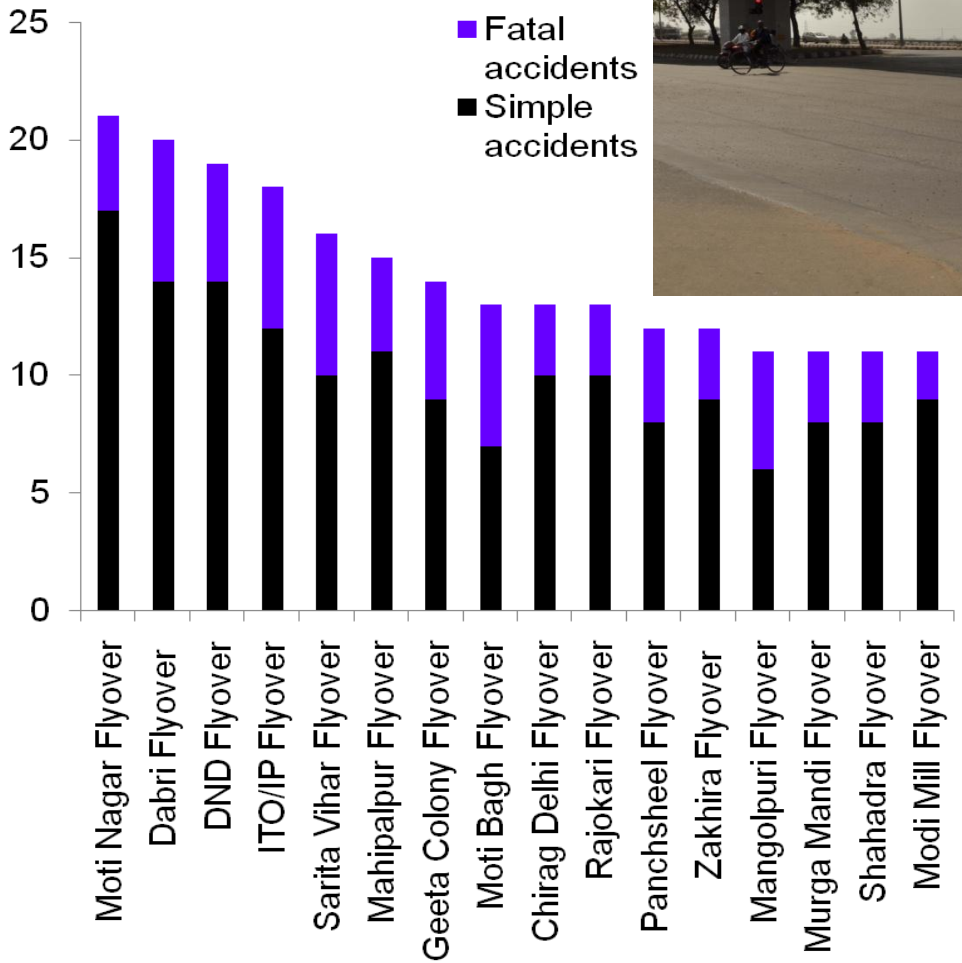


Almost all accidents hotspots are on the arterial roads

Flyovers, poor crossing facilities and public transport access zones

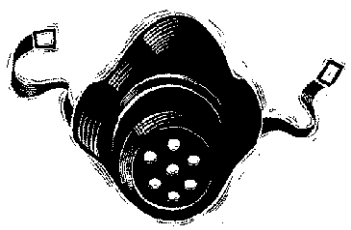
About 40% close to flyovers and 30% in unsafe crossings and junctions.

Flyovers: High risk zones



16 flyovers are listed as accident prone, they account for a total of 14% of the total accidents,

Dabri flyover, ITO/IP flyover, Sarita Vihar flyover, Moti Bagh flyover Dhaulakuan flyover, AIIMS flyover, Sarita Vihar flyover, Mahipalpur flyover, Rajokari flyover are among the notorious.



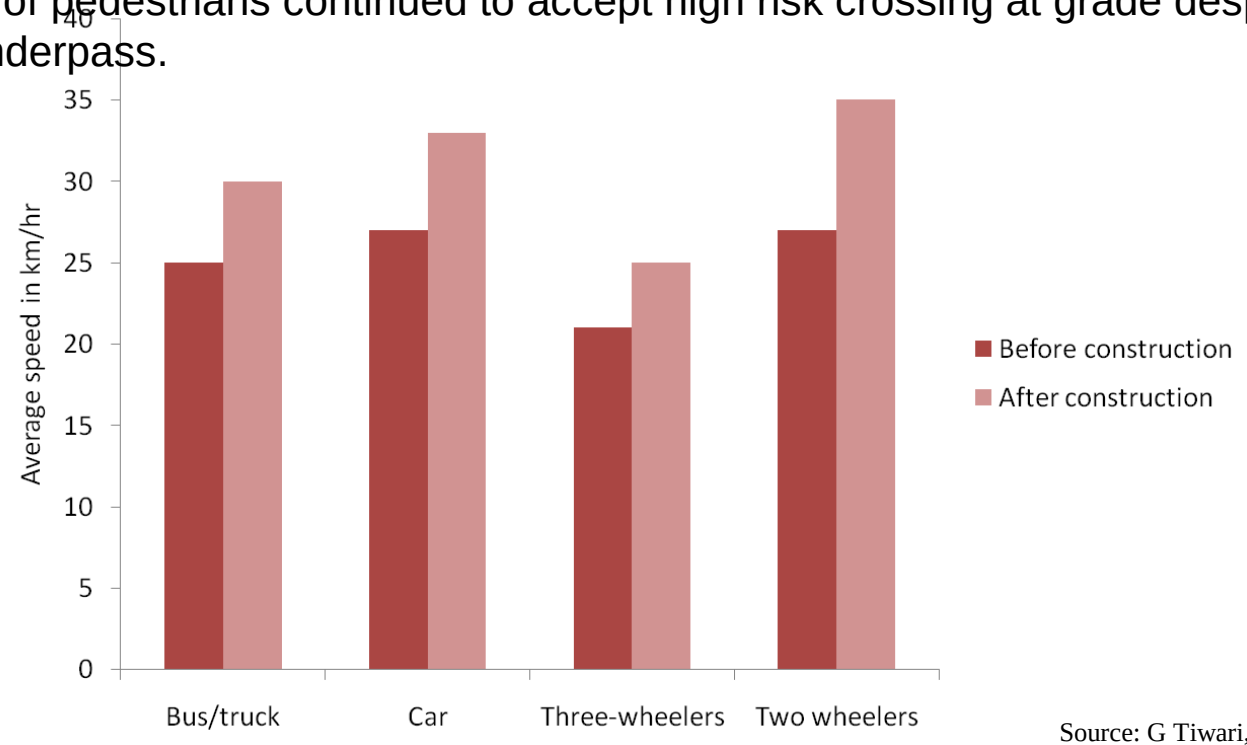
Flyovers increase speed of vehicles and accident risk

•IIT study of AIIMS flyover

• After the construction of flyovers speed of vehicles increased to 21.5%, 22.6%, 15%, 31.6% for the heavy vehicles, car, three wheelers, two wheelers respectively.

•Increased speed shortened the time gap at every stage of crossing. The probability of pedestrian fatality with a specific vehicle group increased 67%, 100%, 100%, and 200% respectively.

•Nearly, 22% of pedestrians continued to accept high risk crossing at grade despite the presence of pedestrian underpass.



Source: G Tiwari, IIT Delhi, 2013

Access to bus and metro stations unsafe: accident hotspots near metro and bus stations…….. 10 Bus Stops are listed as accident spots, account for 8% of the total accidents; 5 Metro stations are listed as accident spots, account for 4% of the total accidents.

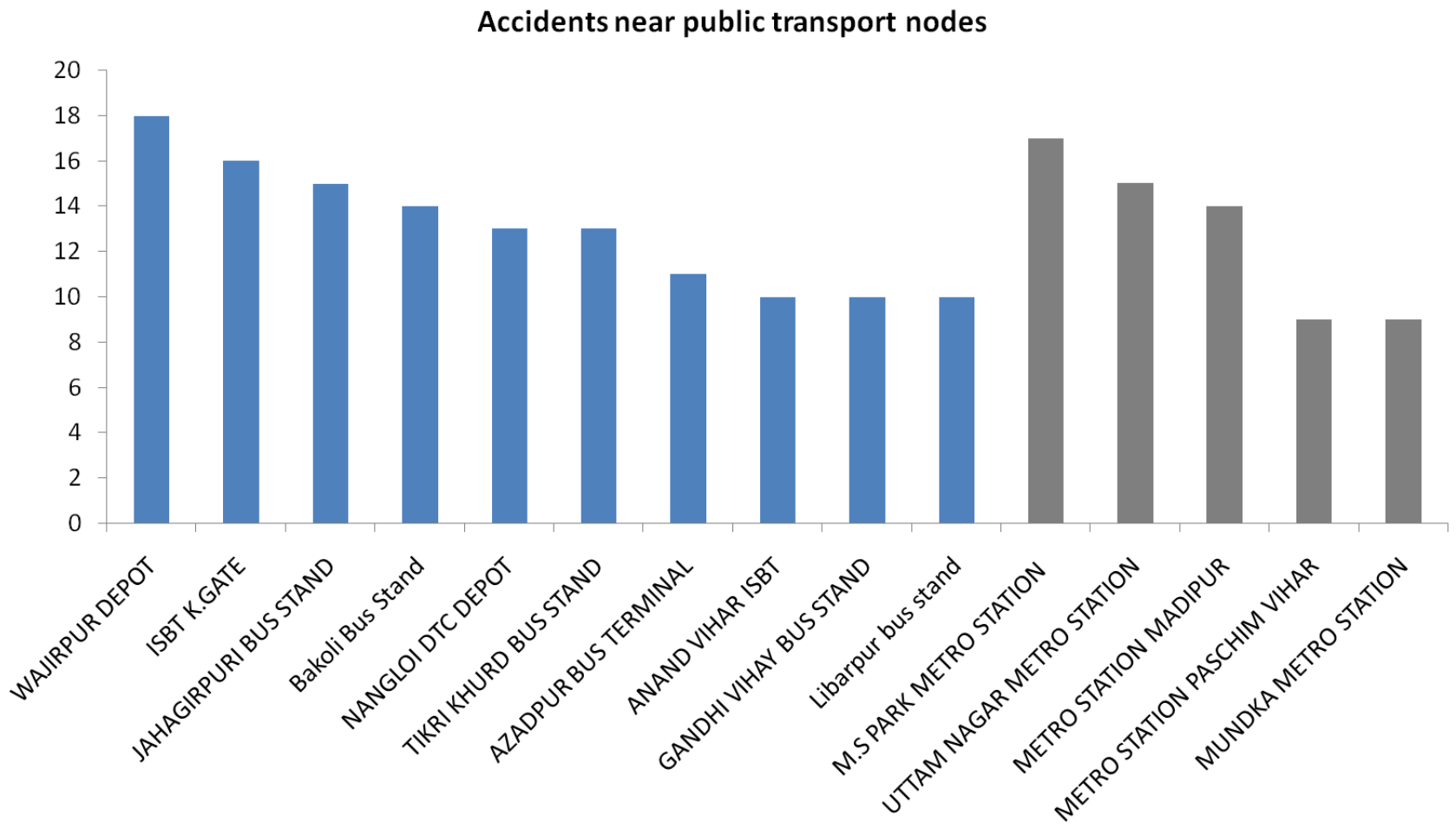
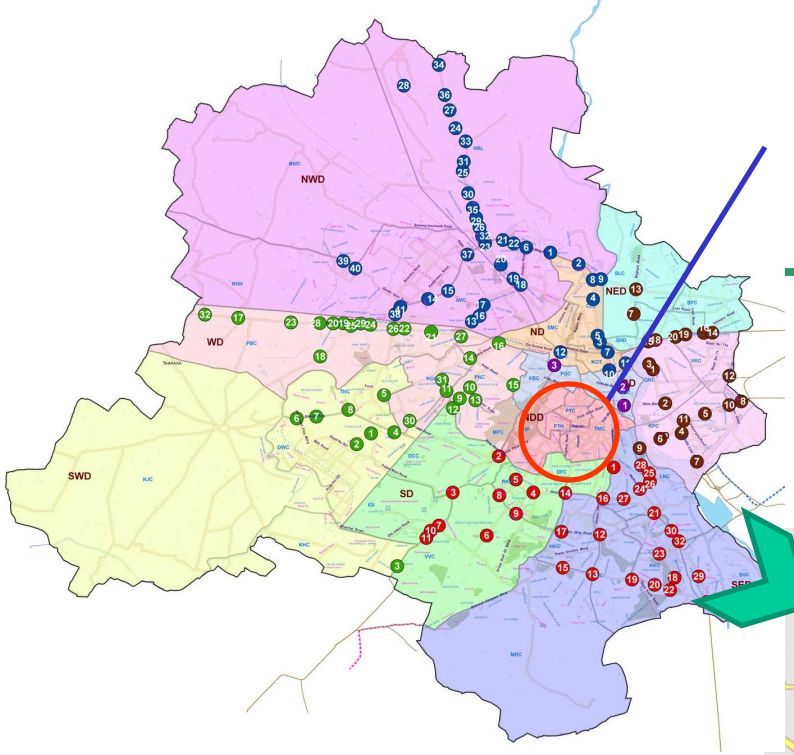


Photo documentation of unsafe crossing by traffic police, Delhi

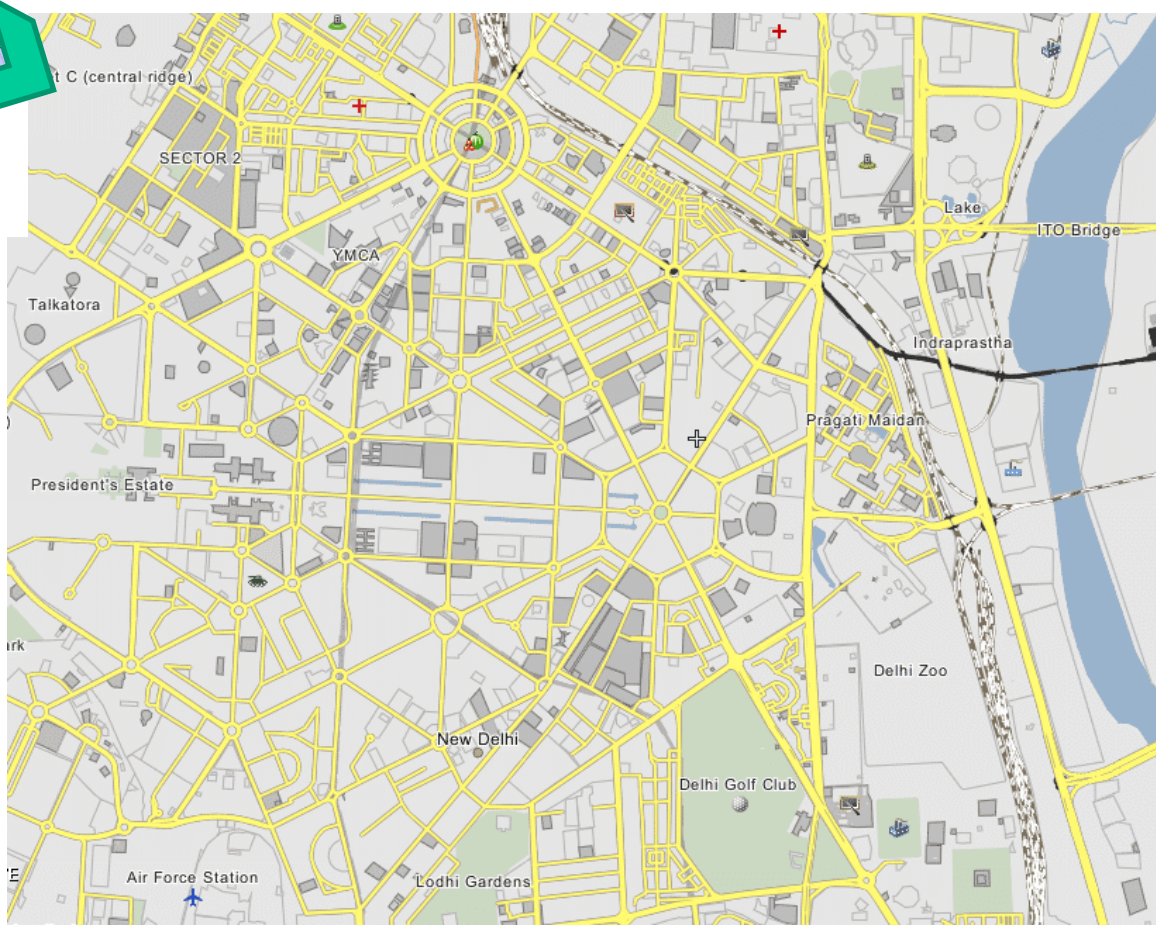
Roads with no proper crossing: 26 junctions are listed as accident hotspots. 23% of total accidents are due to improper junction and crossing design and faclity. These happened in key locations -- Burari Chowk, Ashram Chowk, Seelampur T point etc.

Source: Satyendra Garg, Joint CP/ Traffic, Delhi, Walkability and pedestrian initiatives



Lutyen's Delhi has no accident prone zone, do we see a pattern here in road network

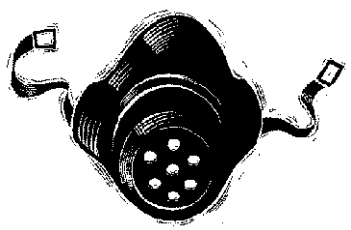
Its road design, four lanes, easy crossing, walk space, round abouts that have traffic calming effect have an impact



Round abouts can be further improved

`Globally rotary designs have improved to make it safer and calmer for all

Example London: Global innovations……



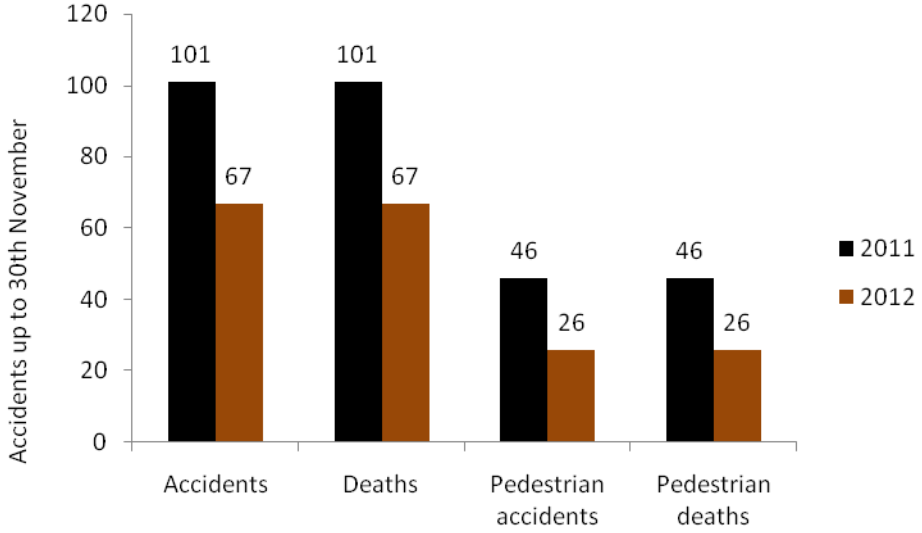
Conventional injury prevention approach

Current policy focus is on vehicle safety, seatbelt and helmet requirements, and speeding and drunk-driving laws…..

Need stringent enforcement and penalty

Rs 100 penalty under Motor Vehicles Act and Rules is not a deterrent……

Nascent steps towards reducing speed……Immediate results



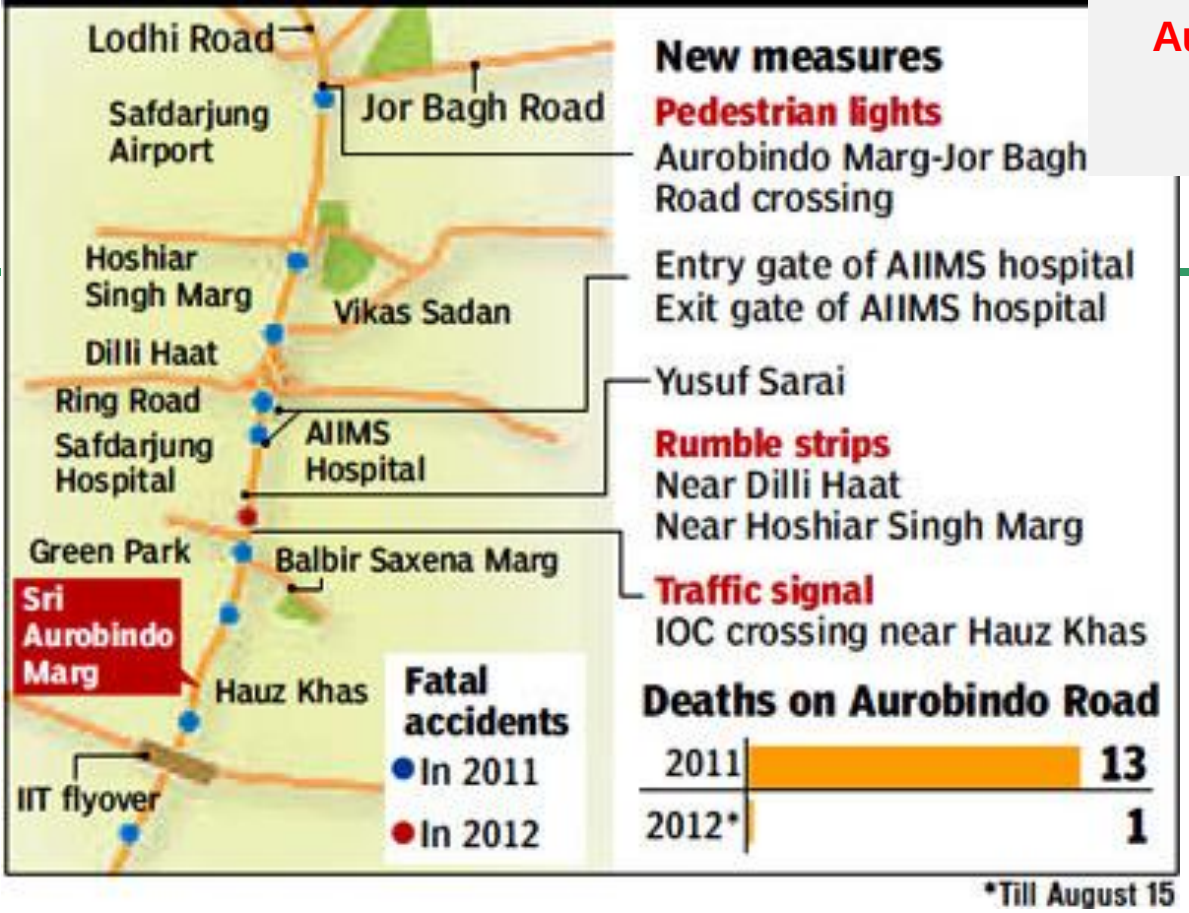
GT Karnal Road NH-1 Intervention of Delhi traffic police

SPEED CLAMING AT SWAROOP NAGAR

PEOPLE CAN CROSS ROAD EASILY

Source: Problems in improving road safety , Satyendra Garg, Joint CP Traffic, Delhi , 6th December 2012

Aurbindo Marg retrofit: saves lives



Signals were brought back

Traffic calming measures adopted

This reduced accidents significantly

New signals at Yusuf Sarai

Mastic strips at AIIMS

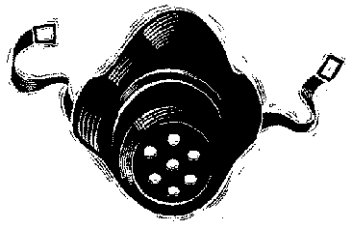
Pedestrian signal at AIIMS.

Source: http://www.hindustantimes.com/india-news/newdelhi/aurobindo-marg-does-a-u-turn/article1-919855.aspx

CSE street audit

Availability of walk and cycling infrastructure

- Footpaths available in 55% of the total length surveyed.
- Only 10% of total length has cycle tracks: Width of the footpath according to the guidelines is minimum 1.8 M and its available only at 10-15% of the total road stretch. The kerb height is unacceptable
- Only 5-10% of total length has kerb height equivalent to standards i.e. 150MM. None of the corridors have continuous footpath.
- Only 10% of total length has cycle tracks.
- Cycle tracks only for 300-400 Mts.
- No legal parking spaces for cycles.



How can we access public transport safely

- Accessibility to public transport nodes poor.
- Bus stops are located on footpaths, -- no clear multi function zone
- Height of the base of the bus stop does not match with the base of the bus- people wait on the street -- kerb height of the footpath upto 900MM;
- Bus stops at the foot of the flyovers endangering commuters

Road designed for vehicles impede people's access

- Intersection without raised table top crossings
- No pelican signals
- No mid section crossing;
- Foot over bridges and subways.
- No crossing on ground for people walking or cycling; medians are blocked with high railings.
- Only 15% of the total corridor studied has visible zebra crossings.
- Opinion survey show 90% of walkers and cyclists prefer crossing on the ground as FOBs or subways increase the distance and are inconvenient.
- Foot over bridges and subways with ramps attract motorized vehicles for crossing.

Environmental Conditions, aesthetics and amenities

- Score poor even in aesthetics and amenities.
- No facilities for women.
- No provision of shaded footpaths. Walking and cycling infrastructure
- Footpaths along the boundary walls -- unsafe and vulnerable to crime;
- Parking on footpaths

How can anyone with some disability can negotiate in city's roads?

- Not designed for disable.
- Kerb height higher than 300mm.
- No raised table top crossings and with medians blocked people vulnerable to accidents
- Tactile paving exist along some portions
- No provision of auditory signals at any corridor.

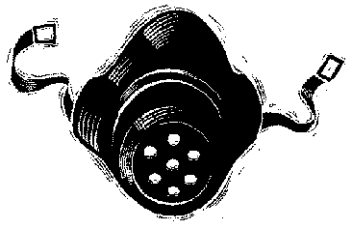
Same stretch can be redesigned for better results……

Conflict of various kinds of vehicles occurring at the foot of foot over bridge. Also encroached market shops reduce carriageway width.

Illegal parking happening all along the service lane along Batra Hospital

Multiple activities happen at the foot over edge such as auto stops, bus stops etc. leading to congestion

A very small part of the stretch has designed cycle track and pedestrian way.



Enforce current laws on road safety and parking

Motor Vehicle Act and Rules of road regulation 1989 regarding Parking: Every driver of a motor vehicle parking on any road shall park in such a way that it does not cause or is not likely to cause a danger, obstruction or undue inconvenience to other road users and the manner of parking is indicated by any signboard or markings on the road side, he shall park his vehicle in such a manner.

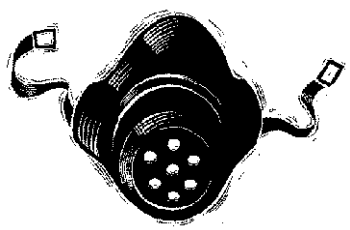
Motorist shall not park vehicle at or near road crossing, a bend; on a footpath; near a traffic light or a pedestrian crossing; main road carrying fast traffic; near a bus stop, school or hospital entrance or blocking a traffic sign..; away from edge of footpath

Delhi Municipal Corporation Act of 1957 on Encroachments on streets by shops, parking etc.

Section 320 (1) *"No person shall, .., erect or set up any wall, fence, rail, post, step, booth or other structure whether fixed or movable or whether of a permanent or temporary nature, or any fixture in or upon any street …in any street so as to form an obstruction to, or an encroachment upon, …."*.

Section 322 (1) on powers of removing illegal encroachments on the public streets:

Section 283 of Indian Penal Code reads as *"Whoever, …causes danger, obstruction or injury to any person in any public way or public line of navigation, shall be punished with fine which may extend to two hundred rupees.*



Yet there are legal provisions that can be leveraged to make a difference

Provisions in current laws with bearing on pedestrian safety. But not harmonised for effective implementation.

Motor Vehicles Act 1988 prohibit the use of footpaths or pavements by motor vehicles. Cautions against danger, injury to the public, among others. This is rarely enforced.

-- Motorist can not drive on footpath or track; But these provisions are not used effectively to remove encroachment and protect road users.

-- While approaching a road junction or pedestrian crossing a motorist must slow down;

-- It prevents parking on pedestrian pathways;

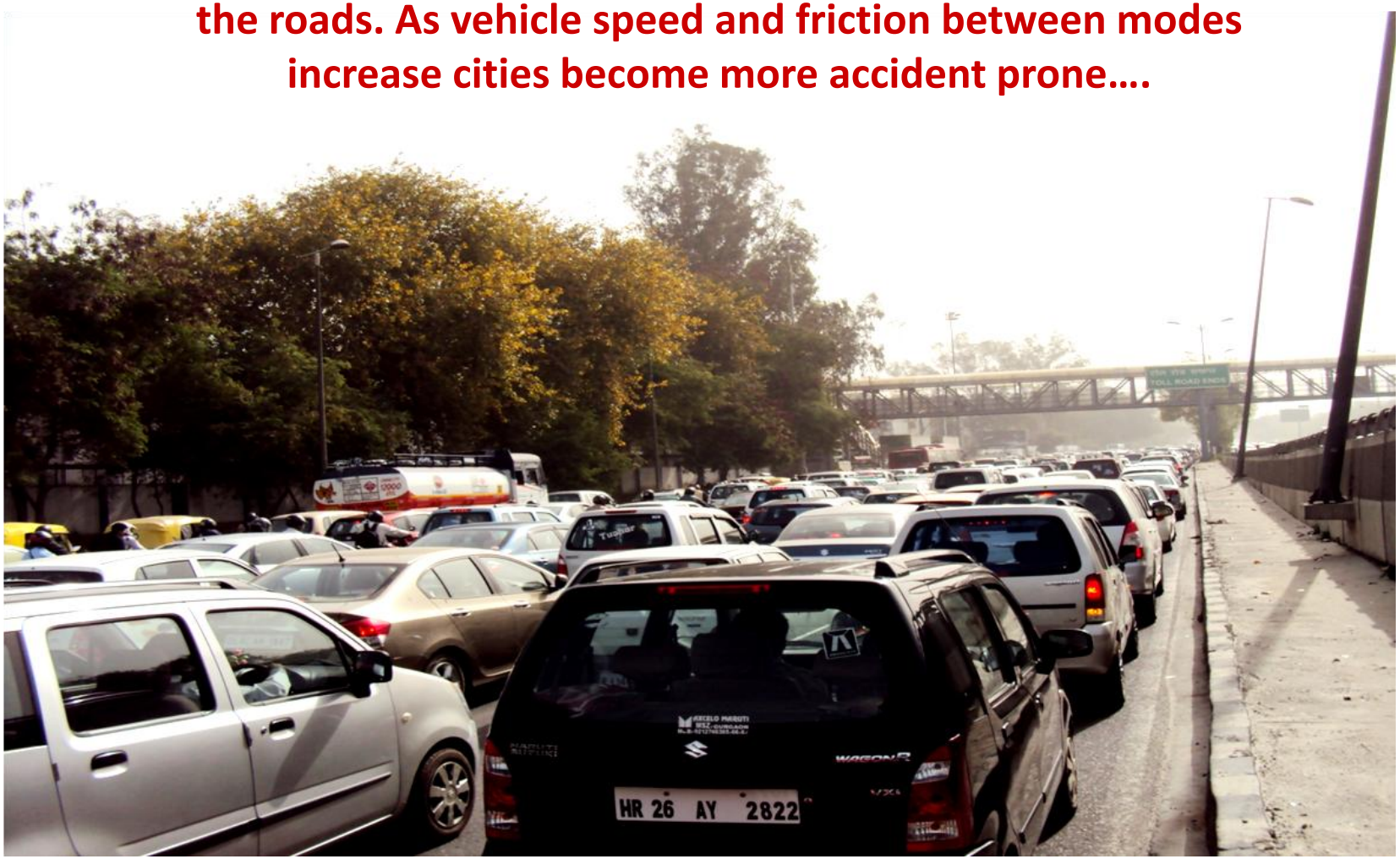
-- Motorist have to strictly stop at the stop line at Junctions/ or pedestrian crossings.

Municipal bye laws to protect footpaths

Street Vendors Act and Rules provide for designated space for vendors

Who is responsible for 'danger' built into road design?

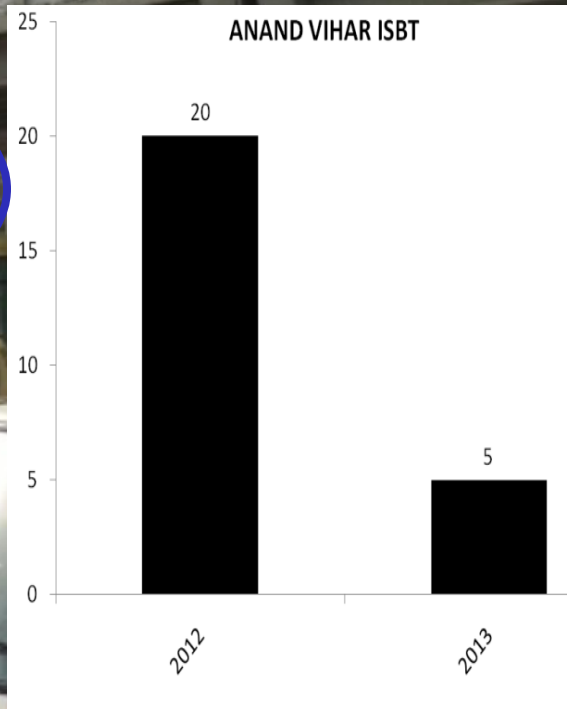
With seamless traffic and FOBs pedestrians disappear from the roads. As vehicle speed and friction between modes increase cities become more accident prone….



Road engineering to remove people from surface for safety is wrong…….

Anand Vihar: Sharp decline in pedestrian accidents from 20 to 5 as people are forced to use FOBs.

Such an approach will hurt sustainable modes…..Traffic police studies have shown that foot over bridges do not work.

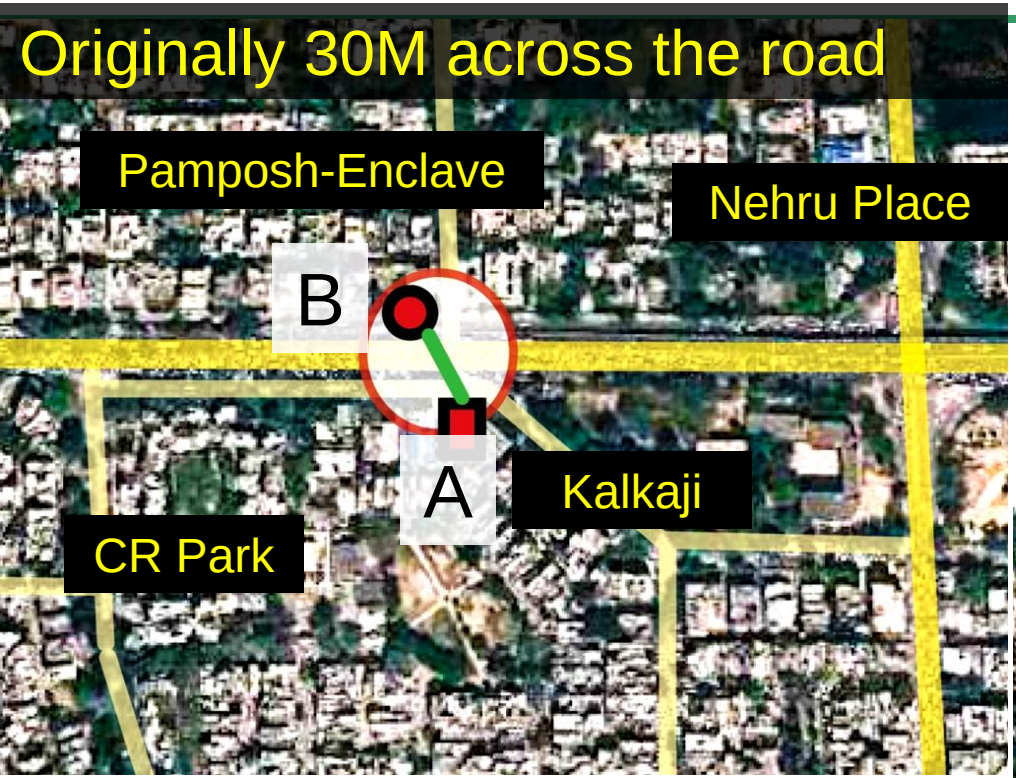


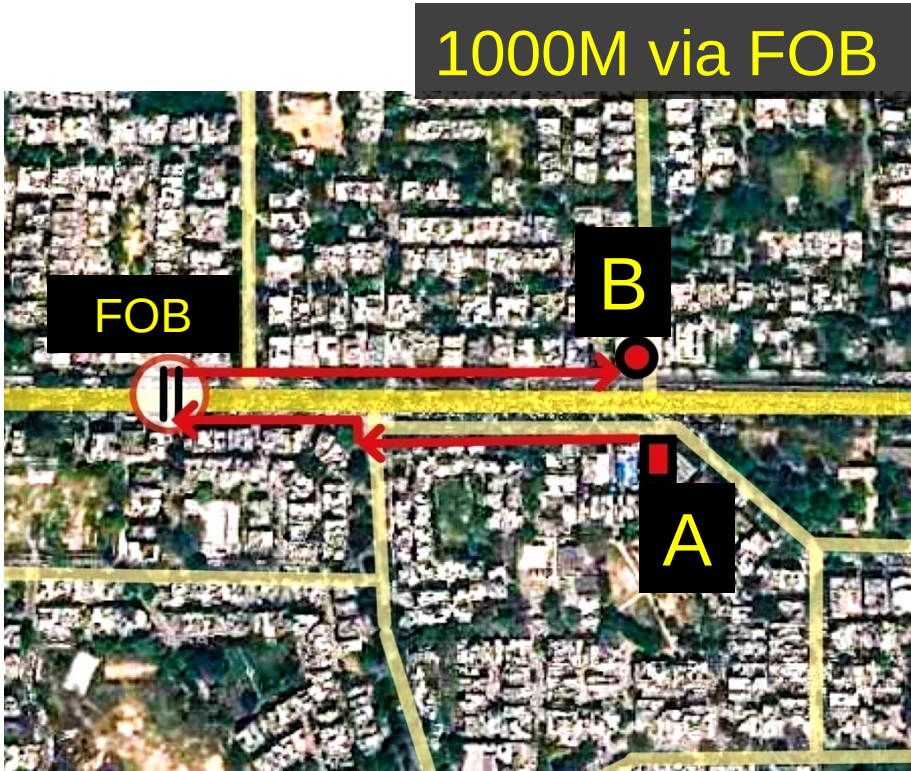
bad news

Kolkata cites accident risk as the reason to ban cycling to free up road space for motor vehicles

Case Study from Delhi

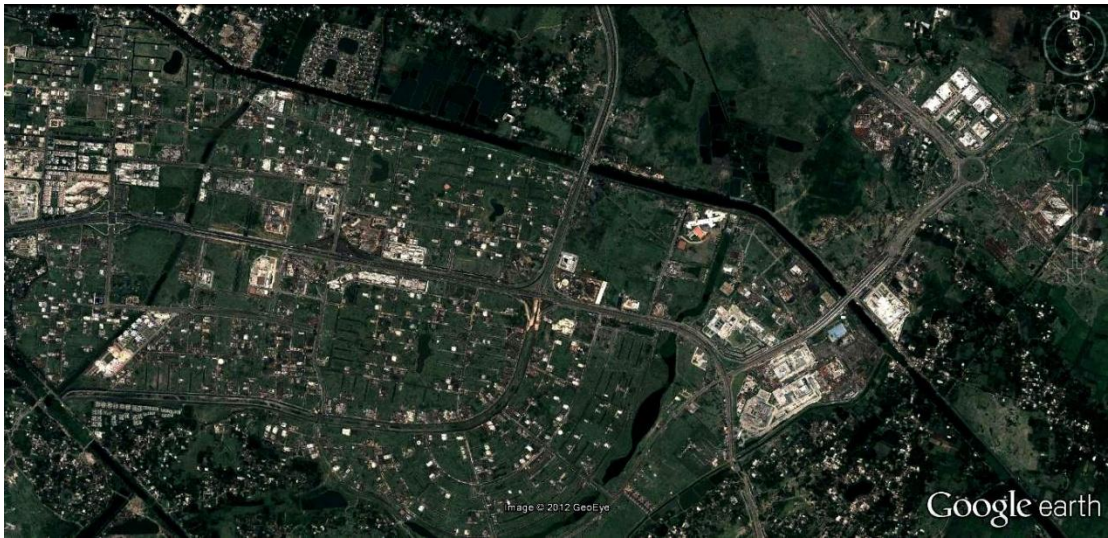
Travelling from A to B



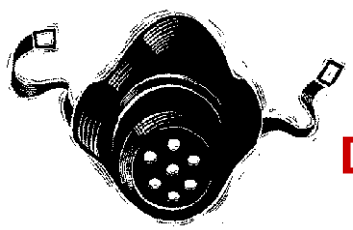


Kolkata's urban form: An advantage

Old Kolkata by the Hoogly



New Town Kolkata



Delhi setting norms for high density requirements

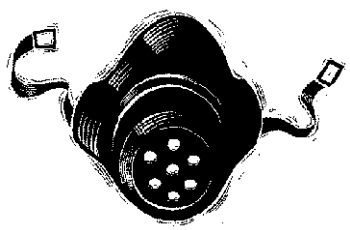
Delhi framing Transit Oriented Development Policy (DDA/UTTIPEC)

Gross FAR (site)	Minimum permissible density (with ±10% variation)	
	Residential dominated project (Residential FAR ≥ 50%)	**Predominantly non-residential** (Residential FAR ≤ 30%)
Below 1.0	Under-utilization of FAR (not permitted)	Under-utilization of FAR (not permitted)
1.1 - 2.0	200- 400 du/ha	100 - 200 du/ha
upto 3.0	400 - 600 du/ha	250 - 400 du/ha
3.1 - 4.0	600 - 800 du/ha	400 - 600 du/ha

*** Site level FAR shall be based on Approved TOD Influence Zone Plan.**

-- Mixed land-use norms: At least 30% residential and 20% Commercial & Institutional use of FAR is mandatory within the Influence Zone.

-- Rajarhat plan 2006 for 3,779 hectares: -- Residential space -- 38 percent; - Industrial land -- 6 percent, -- Commercial land -- 10 percent, -- Institutional use -- 8 percent, -- Transportation zones -- 11 percent, -- Open spaces -- 24 percent, -- IT sector -- 4 percent of 135 hectares diverted for use by IT sector users (source: HIDCO, 2009).



Build compact city

……Devil is in detail

National Habitat Standard Mission of the Ministry of Urban Development

Guidelines for compact mixed land use

-- **95% of residences should have daily needs** retail, parks, primary schools and recreational areas accessible **within 400m walking distance.**

-- **95% residences should have access to employment and public and institutional services by public transport or bicycle or walk or combination of two or more.**

-- **At least 85% of all streets to have mixed use development.**

-- **Need small block size with high density permeable streets etc**

UTTIPEC guidelines

Hierarchy of Facilities	Accessibility Standard from each home/ work place.*
MRTS Station	Approx. 800 m or 10 min walk
Metro feeder/ HOV feeder Stop	Approx. 400 m or 5 min walk
Bus Stop	Approx. 400 m or 5 min walk
IPT/ auto-rickshaw Stand	Approx. 250 m or 3 min walk
Cycle Rickshaw Stand	Approx. 250 m or 3 min walk
Cycle Rental Stand	Approx. 250 m or 3 min walk
Shared private parking garage	Approx. 500 m or 6 min walk

Safety and urban planning…

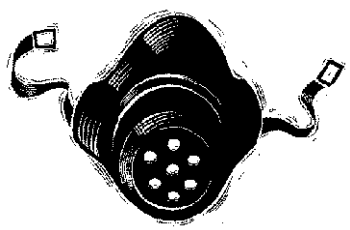
Excerpts:

Initiate planning and road design schemes where unwatched streets can be transformed... to make safe urban areas:
• **Get rid of walls and setbacks. Add street edge uses -- for road safety at night, Transparent fencing** shall be used above 300 mm high toe wall from ground level.
• Add planned hawker zones.

• Adhere to IRC 103:2012 for Street Design.
• Introduce planned mixed-use housing …along road edges of major vulnerable roads.

Slow down vehicles on Roads :
• No more signal free corridors- signalize existing ones.
• Remove gates on public streets from gated colonies from vulnerable areas.

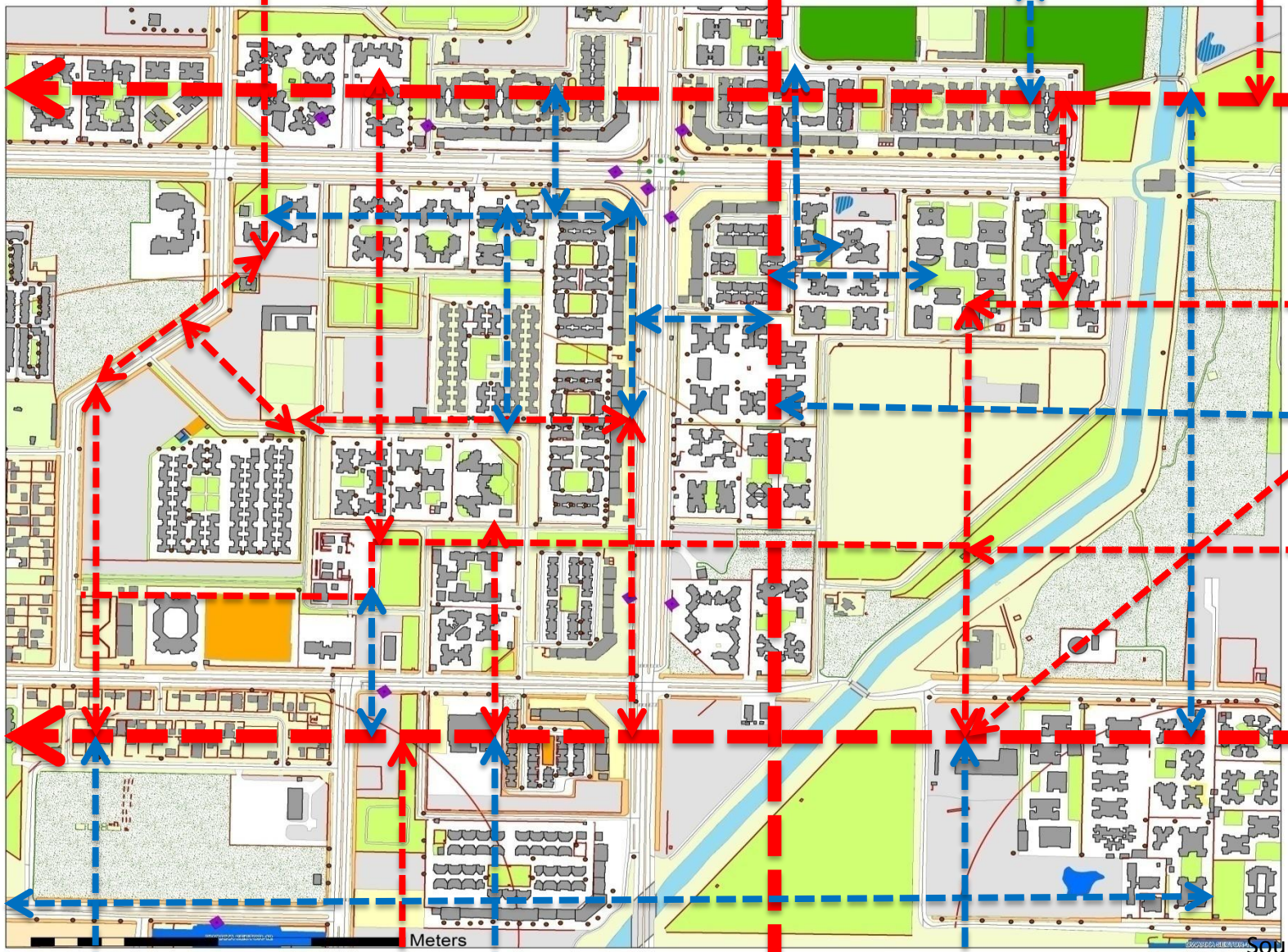
To ensure Safety of Pedestrians:



Where will you feel more safe to walk?

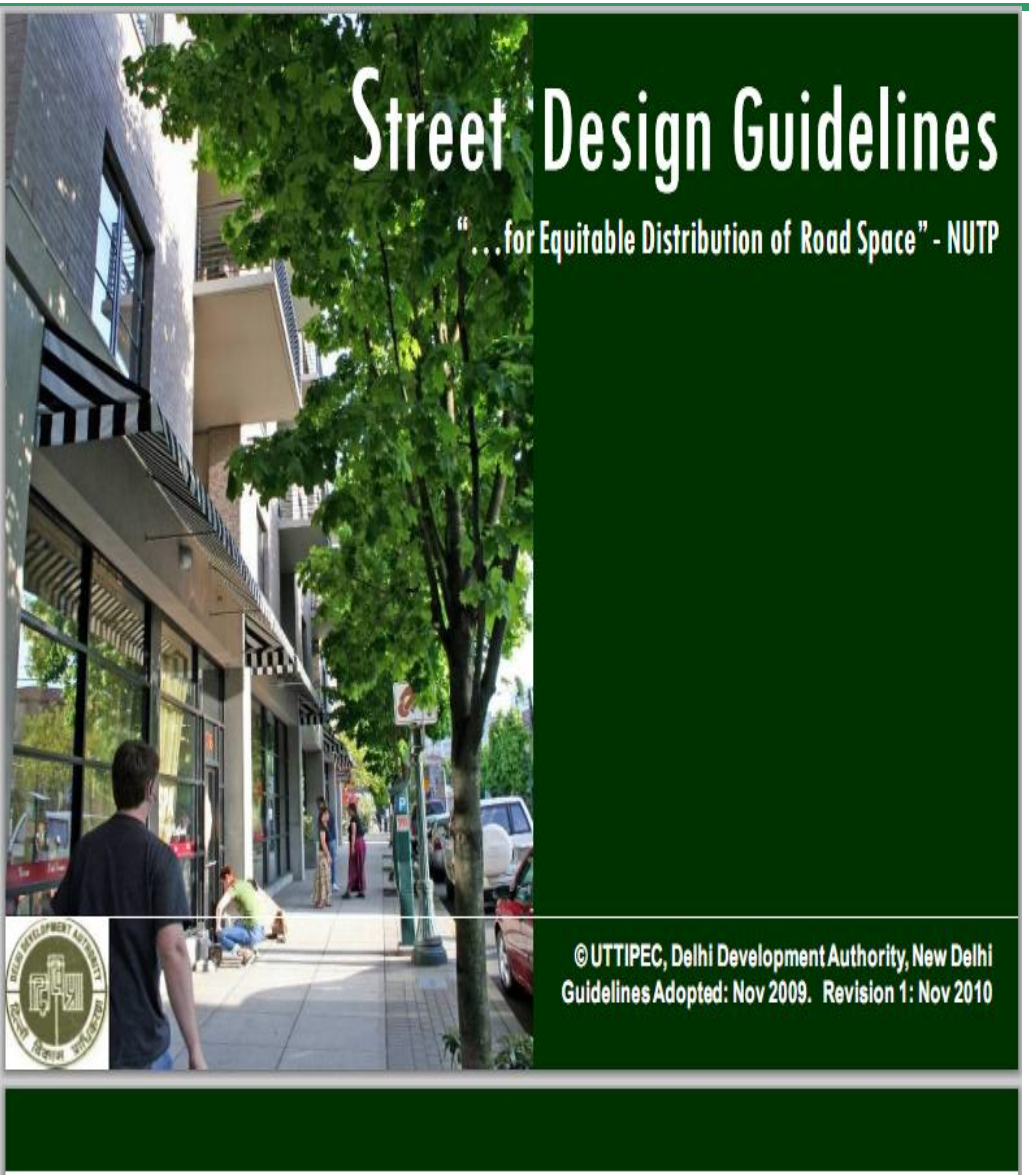
Why do we have building setbacks and boundary walls?

Need dense Street Network



Source: UTTIPEC

Mandate street design guidelines that give primacy to peoples' safety and convenience over vehicle speed…..



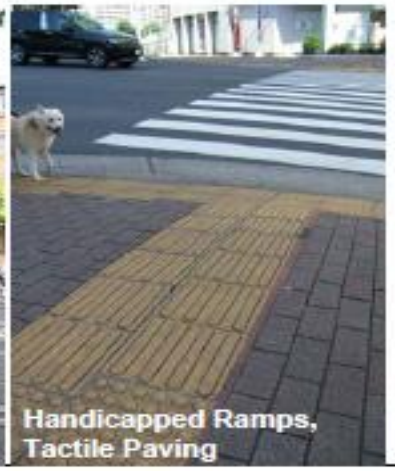
Notify this under Delhi Development Act to make it mandatory

Features of UTTIPEC street design guidelines

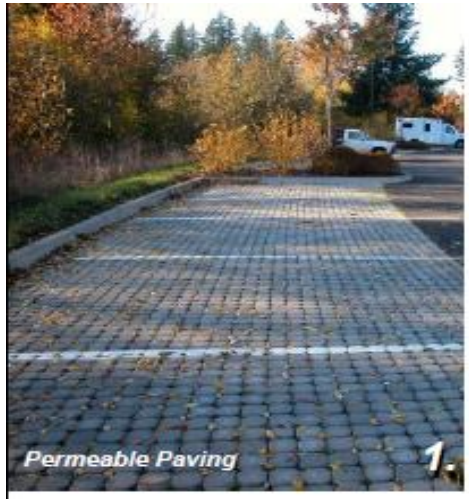
Ensure Accessibility, Legibility and Usability of streets

For Climatic comfort provide: Shading, High albedo materials

Amenities along streets, Signage on pedestrians street, Tactile paving for



Prevent run off. Utilise natural treatment system



New look of footpath in Kolkata: A step forward

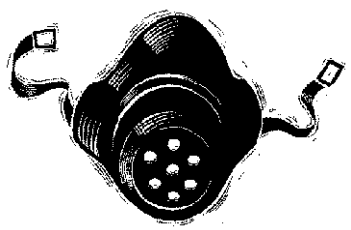
Build proper infrastructure for walkers and cyclists. Protect that infrastructure and users' rights

Source: CSE

Design space for everyone
Hawking can be built into the design

Best practice from Bhubaneswar

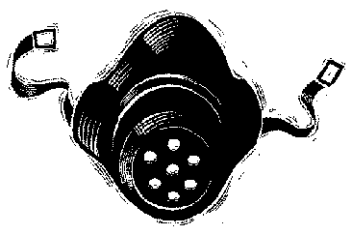
Raj path road, Bhubaneswar



IIT Delhi study 2013: difference in income levels between countries cannot explain fully why rich nations have less accident rates.

Even in the western world, road transport injury rates vary among cities with simlar income and population by a factor of 3-5 because of urban and road design.

Cities with higher proportion of wide street and low density road network have much higher fatality rates compared to more compact cities……



Global action…..

Sweden: Vision Zero road safety policy: Prioritise safety over speed -- low urban speed-limits, pedestrian zones and barriers to separate cars from bikes. Proposing speed limit of 30 km/hour. Built 1,500 km of "2+1" roads where each lane of traffic takes turns to use a middle lane for overtaking have saved 145 lives.

-- Built 12,600 safer crossings along with strict policing that have halved the number of pedestrian deaths over the past five years.

-- Integrated Guidelines for traffic safety, crime prevention, under Traffic for an attractive city (TRAST). **Swedish police guidelines include safety audit guidelines**.

Netherlands: Sustainable Safety vision has led to implementation of effective road safety measures. Infrastructure measures have reduced number of fatalities by 30 per cent nationwide.

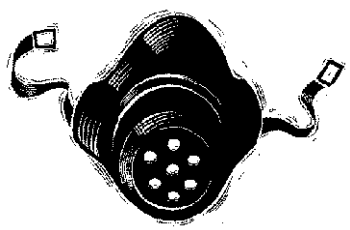
Europe: Slowing traffic down, separation of vulnerable people from motorised traffic, initiating awareness campaigns, and more pedestrian crossings and fines for violation of pedestrian spaces.

In EU, fines are prescribed by law, either as part of a Road Traffic Act, or subject of a special legislative provision.

Some countries allow police officers to decide the actual amount of the fine according to the specificity of the traffic situation.

In Finland, Sweden, Norway and Switzerland the amount of the fine is a function of the net income of the offender.

Paris: City Mayor has announced a maximum speed limit of 30 km/hr on all streets of the city.



Stringency….

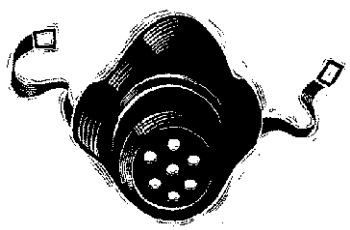
United Kingdom: Careless driving fined up to £100; points added on to their licence. Proposal -- restrict motorists to a speed of 15 mph and a fine of 100 pounds and three penalty points for overtaking cyclists. This is for few cities where cycle flows are high.

Germany: A computerised point system for traffic violations. One can incur up to three points if offence endangers traffic safety. Once there are eight demerit points, the license is immediately revoked. To get it back, one need to take a physical and mental status examination and pass it successfully.

California: A new traffic law to be implemented from September 2014 aims to reduce high rates of bicycle accidents, injuries, and fatalities across the state. Motorists will be required to keep at least a three-foot distance away from bicycle riders as they pass them of the road.

Oman: The Royal Oman Police introduced speed cameras — both stationery and hidden to monitor roads. Stricter punitive measures against those who jump signals were introduced and all these contributed in reduction in number of road fatalities.

Other cities: In London, Road Traffic Reduction Act allows authorities to reduce traffic levels or their rate of growth in targeted area to reduce congestion and improve air quality. **San Francisco** -- Better Street Policy. **New York** promoting pedestrian infrastructure. In **Auckland** Land Transport (Road Users) Rule stops motorists from stopping, or parking on a footpath and pedestrians have to be given right of the way.



Act Now….

Need high penalty and stringent enforcement of current laws: Motor Vehicles Act and Rules focus on vehicle safety, seatbelt and helmet requirements, and speeding and drunk-driving laws. This can work effectively only with strong deterrence and stringent penalty.

Reform Motor Vehicles Act and Rules for stringent penalty, reduce speed limit in cities to 30 km/hour in cities as per global best practice and set target to achieve zero fatalities

Improve traffic surveillance and technology aids.

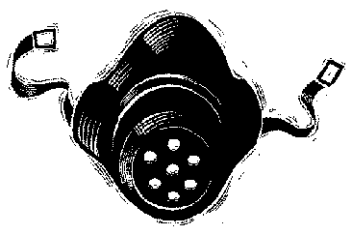
Need for comprehensive road safety act addressing safety of all road users including vulnerable road users such as pedestrians, cyclists and two-wheeler riders

Notify street design guidelines under Delhi Development Act to make it mandatory. For national action notify under Central Motor Vehicles Act and Rule

Mandate implementation of pedestrian and cycling plans and pre and post construction road safety audits of roads. Public transport plans must include pedestrian plan for multimodal integration.

Make encroachment (parking, gardens etc) on footpaths punishable under law

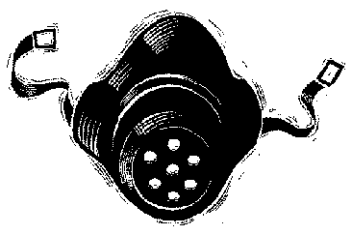
Implement measures to reduce traffic volumes and introduce traffic calming measures. Traffic calming must on highways/arterials within city



What is parking crisis?

- **Parking: wasteful use of cars**: For about 90 to 95 per cent of the time a car is parked. (CRRI)
- **Insatiable demand for land**: If demand for land for an average car is computed -- the total cars already use up 10% city's urbanised area. This is 1.7 times higher than the total area of Dwarka
- **Staggering pressure on land:** In Delhi parking demand from annual registration is equivalent to 471 football fields!
- **Oversupply of parking and lack of mobility option is a trap**

Kolkata require area equal to 119 football fields for additional cars every year.



Paying with lives for free parking Blood bath over parking……. Brutal statistics

December 2009: A factory owner in central Delhi's Anand Parbat area was killed in a scuffle that broke out over parking

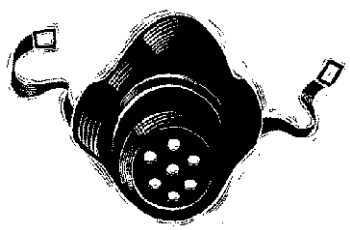
2011: Panchsheel Park a few years ago, where a resident sustained bullet injury after his neighbour attacked him for parking right outside his gate.

January 2012: A former Delhi Police home guard opened fire on a watchman over parking in Punjabi Bagh in west Delhi.

April 2012: An autorickshaw driver beaten to death by his neighbours in Geeta Colony for parking outside their house.

September 2012: An argument over parking in Kalkaji in South Delhi led to the murder of a property dealer.
-- Two persons stabbed by their tenants in Munirka in south Delhi after arguments over parking.

December 2013: Taxi driver shot at Indraprastha Estate due to enmity over parking. -- A student killed outside an educational institution in Karkardooma while trying to park. ……... And more



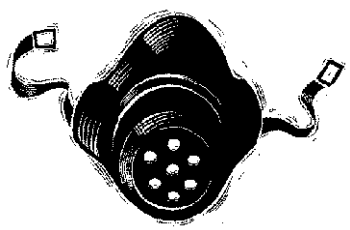
Supreme Court – EPCA
Parking policy identified as car restraint measure……

2006

"Land is limited and there is a limit to the additional parking space that can be created in the city. …. well thought out pricing policy to control the demand for parking."

- The provision of parking for personal vehicles cannot be considered as a matter of public good.
- Users of personal vehicle should pay for the use of the space for parking. The 'user pays' principle should govern the pricing of parking.
- Government should not subsidise this cost
- Use a wide variety of tools for pricing parking -- time variable rates –etc.
- On the basis of these principles MCD, DDA, NDMC should frame the rationalised pricing policy for all types of parking facilities…

Supreme Court takes this on board. Issues directives for a parking policy as a demand management tool…….



National Urban Transport Policy

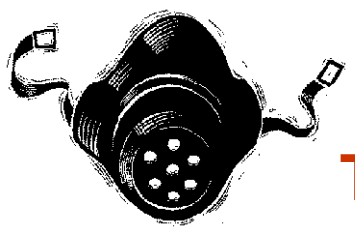
-- Urban land is valuable. Levy high parking fee that represents value of land occupied. Graded parking fee should recover the cost of the land. Make public transport more attractive.

-- Public transport vehicles and non-motorised modes of transport be given preference in parking space allocation.

-- Park and ride facilities for bicycle users with convenient interchange are a useful measure.

-- In residential areas byelaws need changes to free the public carriageway….

Leverage this….



The key elements of parking policy…..

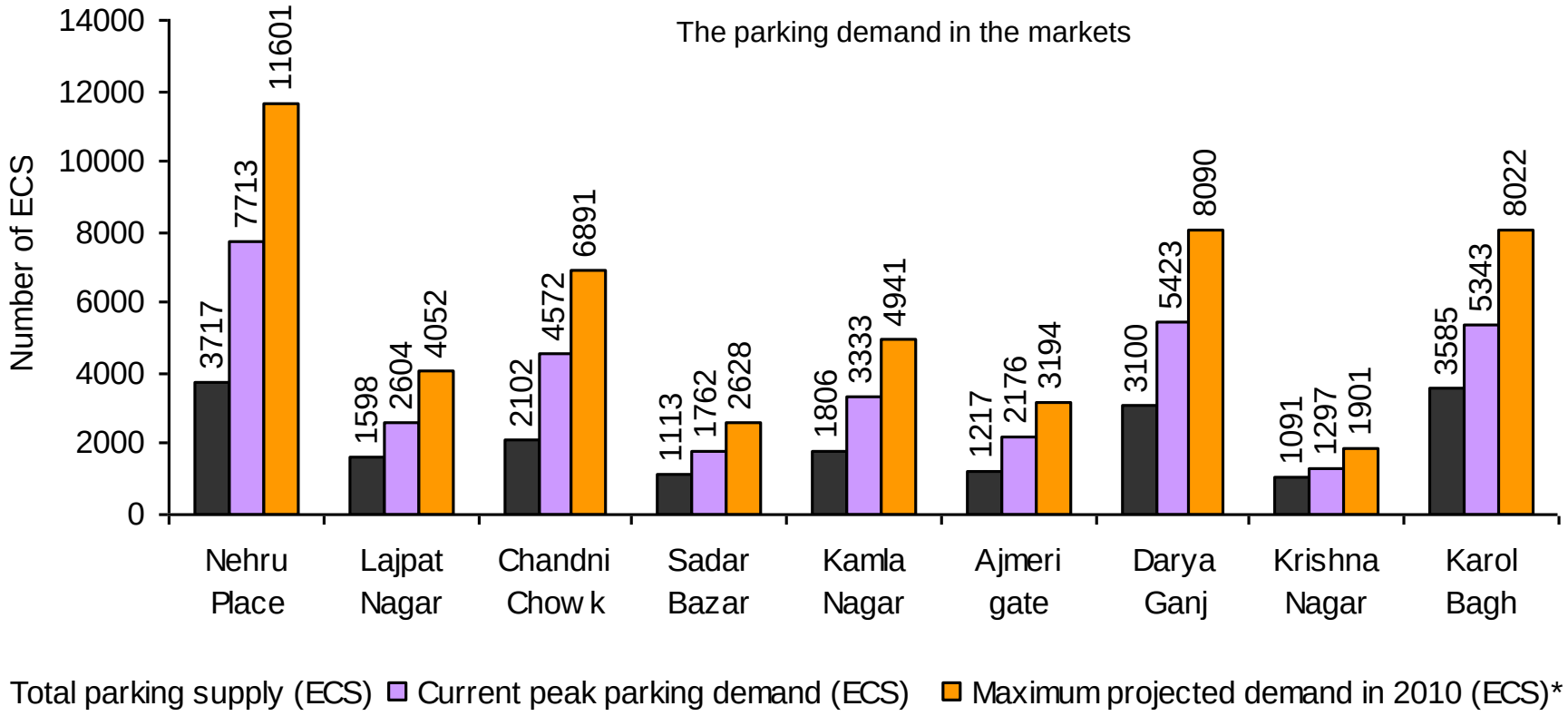
-- Principles for parking policy as a travel demand strategy

--- Parking management and enforcement

-- Paying for Parking

-- Parking strategy in areas with good public transport connectivity

Move away from conventional planning of bridging the demand and supply gap…

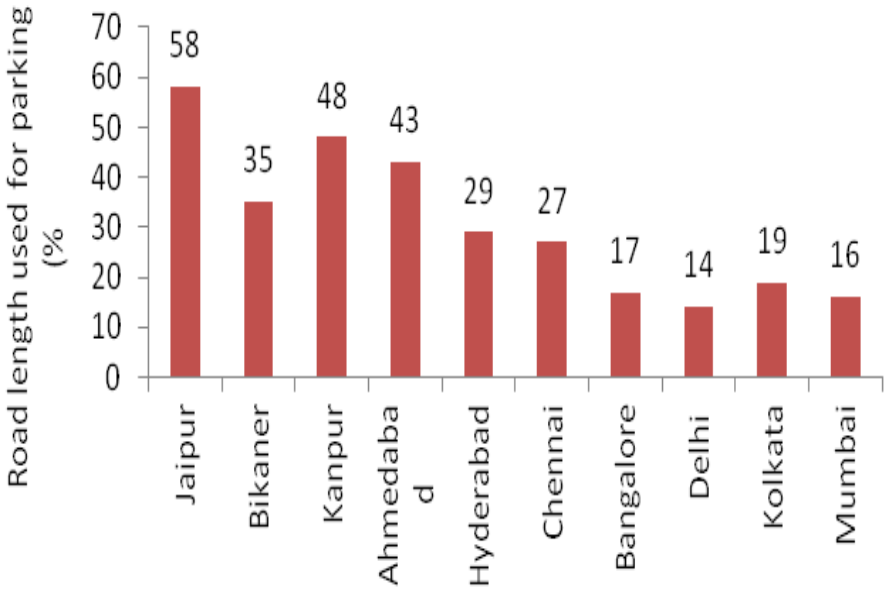


*Note: *Compound annual growth rate of car (10 per cent) and two-wheeler (6 per cent)*

Source: Based on CRRI 2006, Congestion and parking problems of selected locations in Delhi, Final report, New Delhi

On-street parking…… Roads under pressure

On –street parking on major road corridors

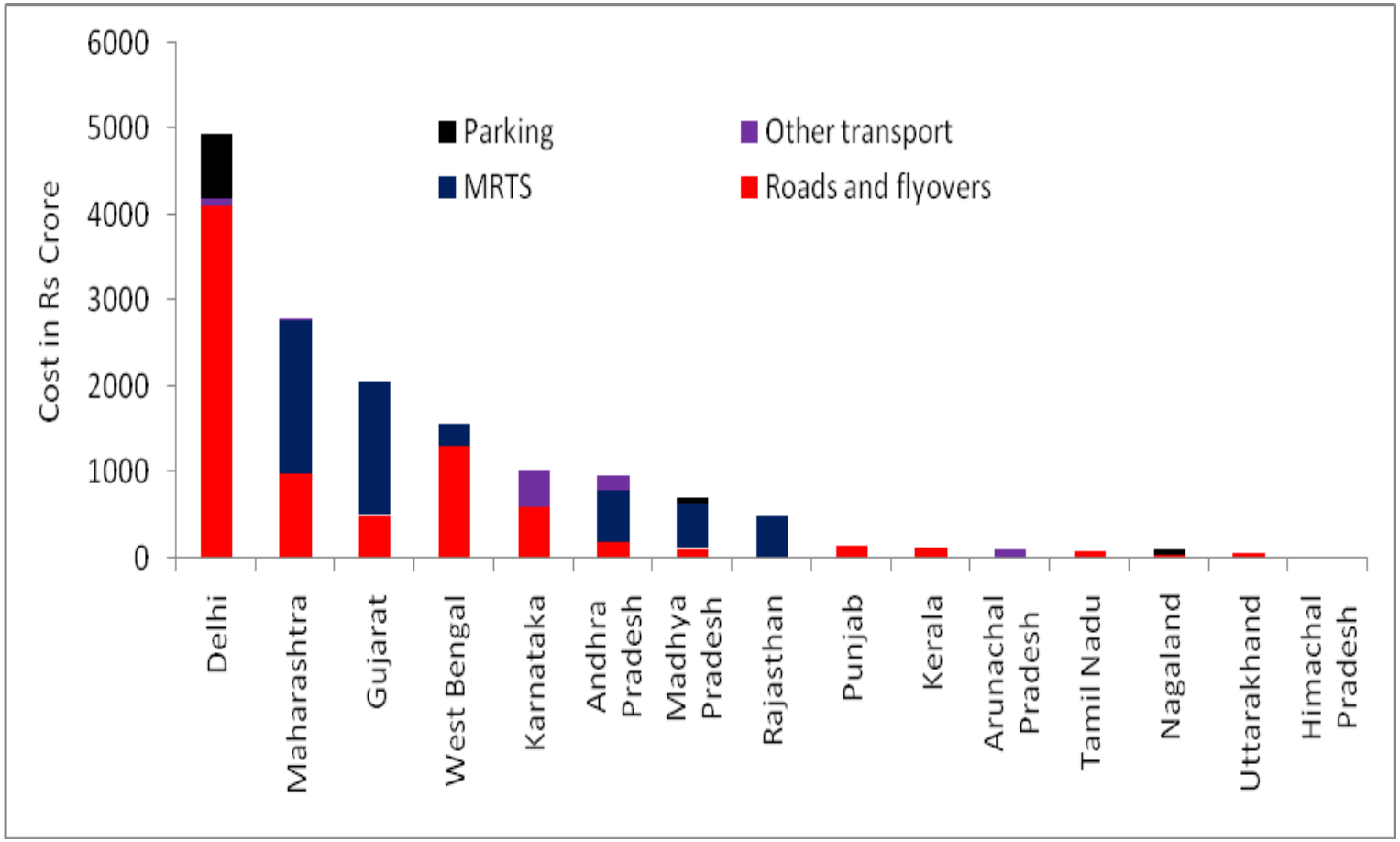


On-street parking: A serious challenge

Source: RITES/CRRI

Obsession with multilevel parking lots without local area planning is a problem

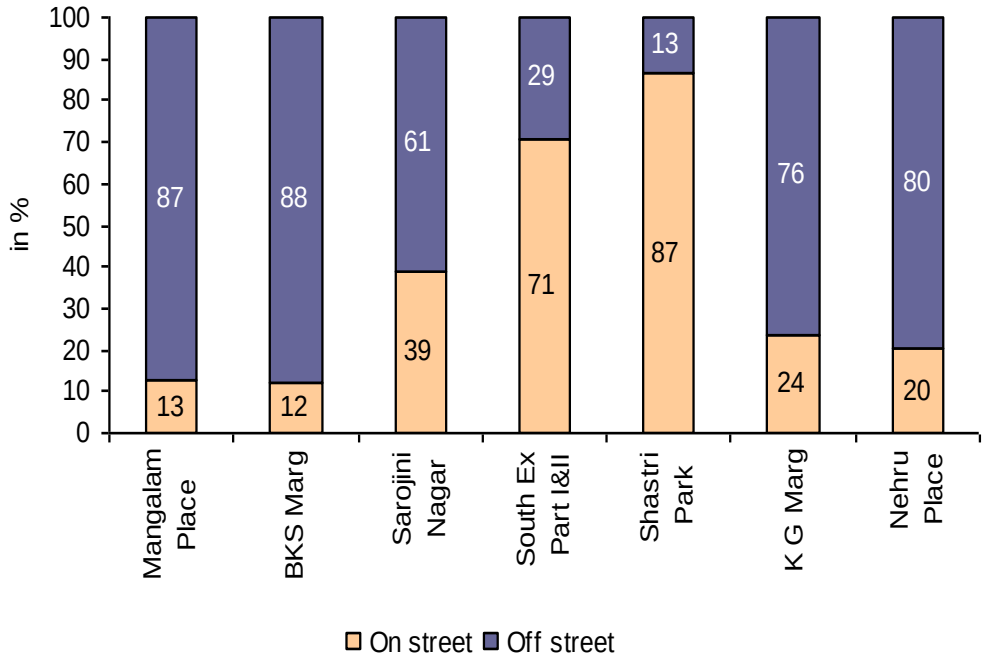
Eg. JNNURM funding State-wise approved cost (Rs crore) and with projects



Source: CSE: Project analysis based on data provided in http://jnnurm.nic.in/

Before looking for more areas for parking manage the available parking well:

On-street vs off-street….



Need judicious use of on-street parking

This can lower demand for land for expensive off-site parking which is scarce

Off-street needs more space and land for access; adversely affects walkways and open areas

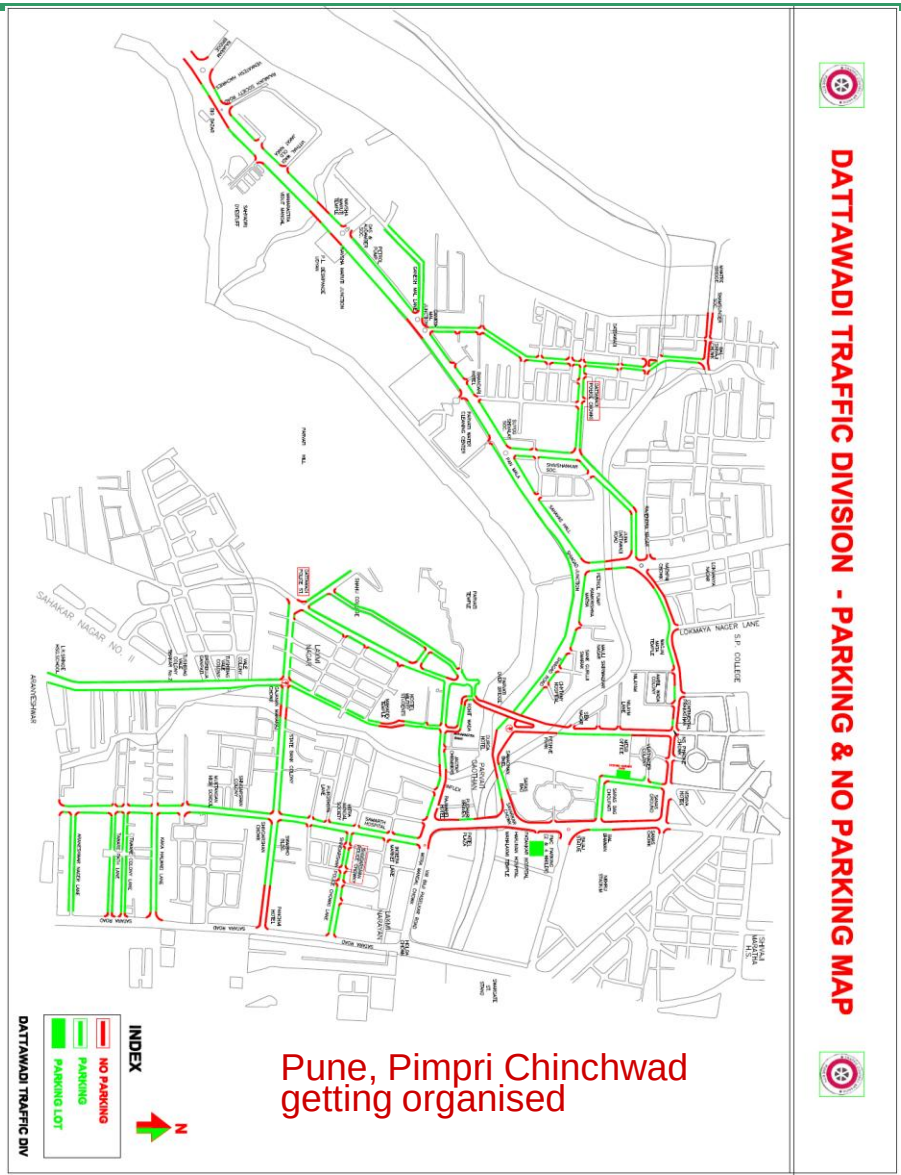
Entry exit from high capacity structured parking adds to local traffic circulation and congestion

International experience shows that efficient management and proper utilisation of legal parking lots can increase parking capacity by atleast 20-40 percent.

Enforcement: Tame the chaos

- Map out high and low demand area
- Open up underutilised off street parking for public parking
- If managed well on-street can meet most of the demand
- Demarcate legal parking spaces. Organise them well.
  Inventorise the parking spaces. Put out the list on the website
  Prevent encroachment of walkways
  Put up signages and information systems
  Introduce metering
  Impose penalty
- Move motorists to low demand streets during peak time to address spill over

Demarcation in other cities – Chennai, Pune, Pimpri Chinchwad etc

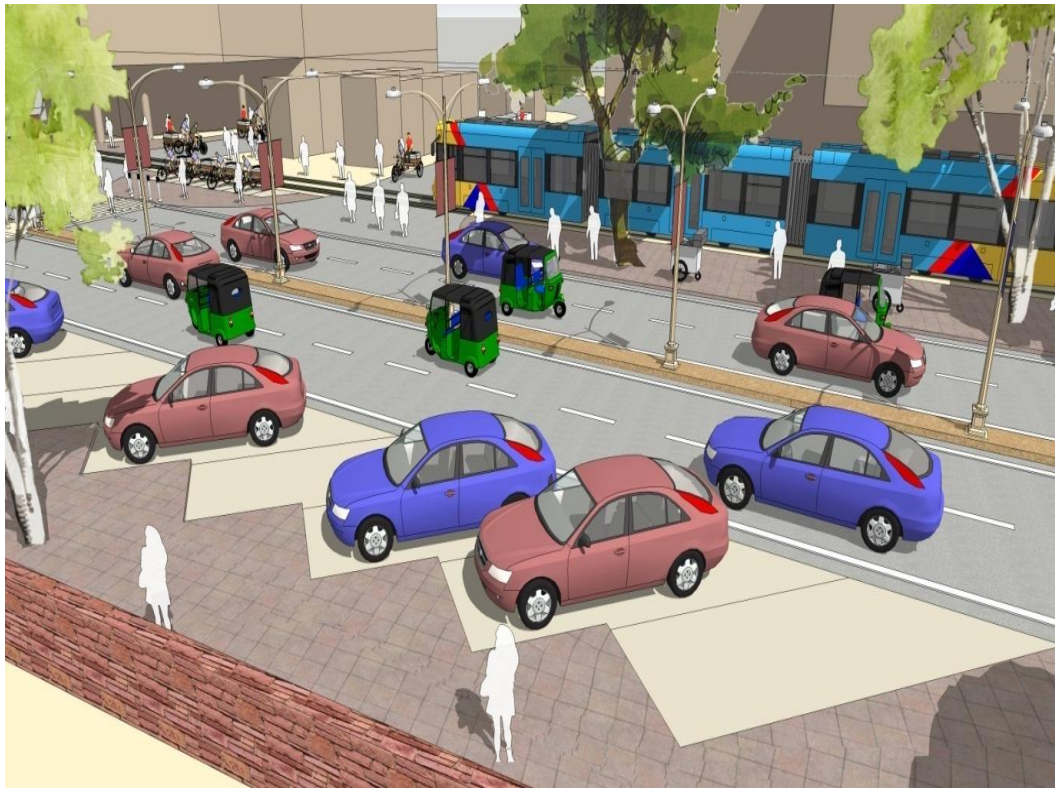


Pune, Pimpri Chinchwad getting organised

Encroached pavements
Need method in madness

Alaknanda

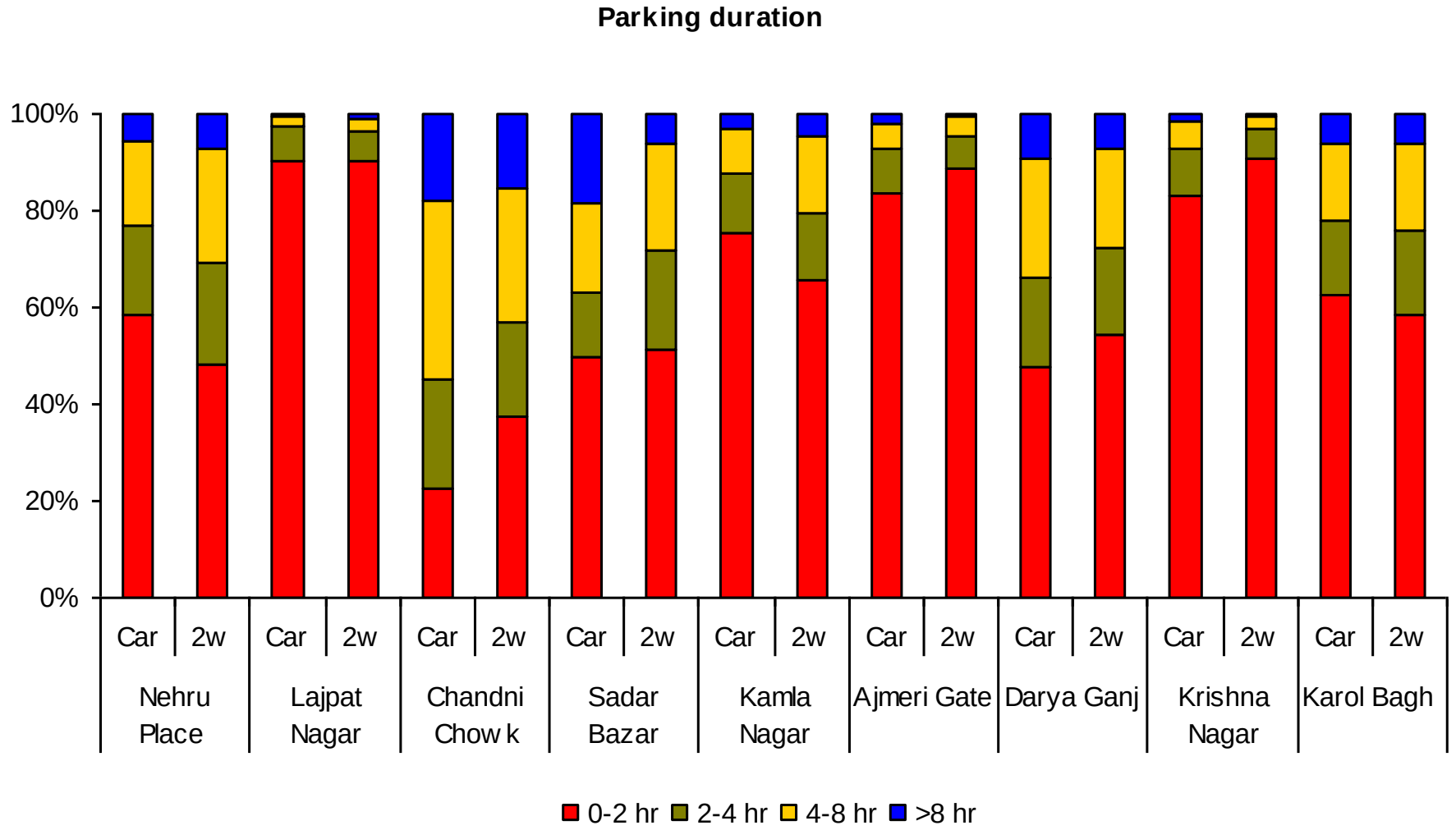
Inventive design, Source: I Trans



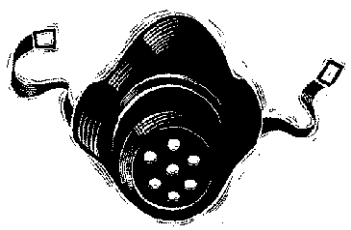
Good practices in the region: Colombo

Short term users dominate parking lots

In many sites 50 to 85 percent of users stay upto 2 hours



Source: Based on CRRI Study



Tightening management can allow motorists to take large number of decisions

“If you tighten controls, what will I do? Public transport is so inadequate!!!!!”….

Good management including peak time management and pricing trigger many decisions:

-- Combine trips

-- Avoid peak time

-- Share car with family members and colleagues

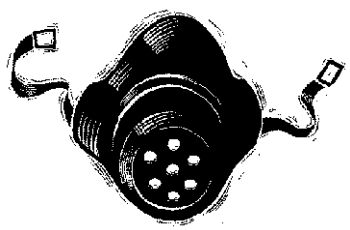
-- Look for cheaper parking areas off-street

-- Take auto or a taxi

-- Just walk or cycle

-- Take metro or a bus – especially if you are a long term parker

-- Influence parking duration and purpose of parking



Upgrade parking management

The agreement with the parking contractors need technical upgrades. Need protocol for contract and competitive tendering:

-- Set management rules

-- Signages and pricing meters and mode of payments like the smart cards

-- IT systems for information and enforcement; prevent illegal parking that can compromise safety

-- Facilities to clamp or tow away vehicles

-- Parking monitoring

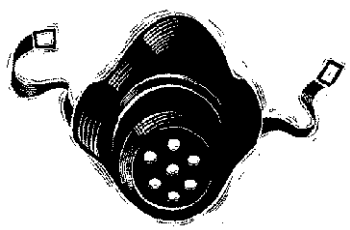
-- Parking data collection and analysis for policy feed back

-- Street design and management of queues

-- Street reconstruction services

-- Carry out proper surveys to know the expected revenue.

-- Link parking pricing with linked with parking management goals. The co-benefit is revenue and local area development



The confounding questions……How much parking is enough?

Public policy decides how much parking to be built in buildings and in public space…..

The principle is prescribe minimum. If needed provide more. Supply driven strategy

There is no common matrix in India

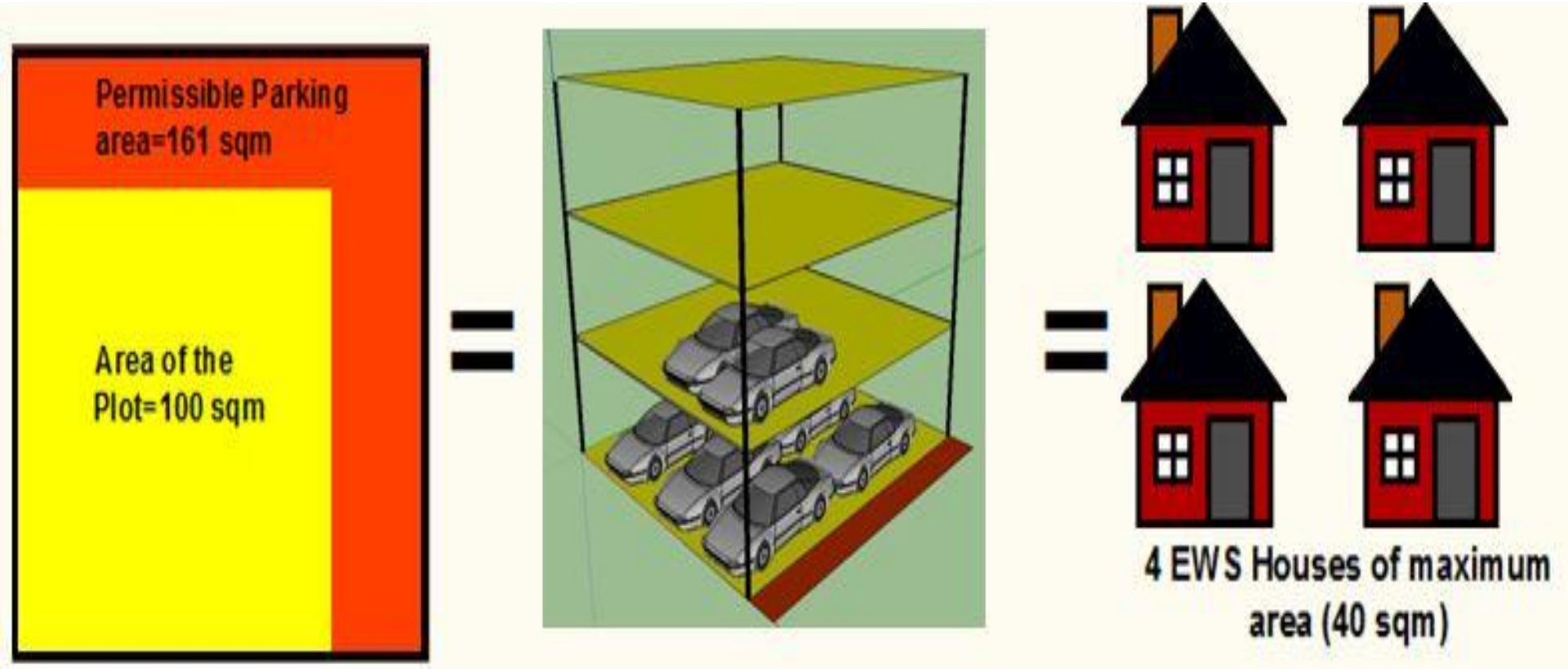
Delhi Master Plan 3 ECS/100 sqm in Commercial; 2 ECS/100 sqm in residential; 1.8 ECS/100 sqm in Government buildings.

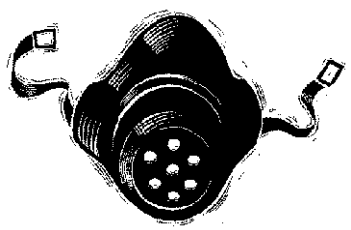
Kolkata and Pune specify ECS per 75 sq m;

Hyderabad – upto 60 per cent of built up area……and so on

Why are we wasting so much valuable space for parking

A 100 sqm plot built to the full allowable FAR (315 sq m) needs 161 sq m of parking space by Law -- more than half. If provided in the built up area it will gobble up one and half storey or space of 4 EWS dwellings





Global cities are limiting and pricing parking

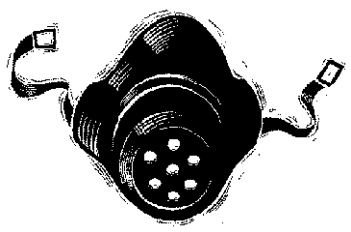
Shifting from minimum requirement to maximum/caps

Flexible standards: Eg. In Hong Kong parking provision is decided based on accessibility of an area. In Tokyo parking norms in CBD lower than Delhi…..

Rigid norms can create over capacity: Account for improved accessibility to limit future expansion and reduce parking demand

- Sites may change from parking deficit to parking surplus. The parking plans must account for the changes in parking demand with improvement in public transport. For Eg, -- In CP parking demand dropped by 10% after introduction of metro.
- The feasibility study for Mangalam Place projects shift in modal split in favour of public transport after metro. DMRC study shows that in Vikas Marg metro can reduce the trips of different modes. That will indirectly impact upon parking demand.

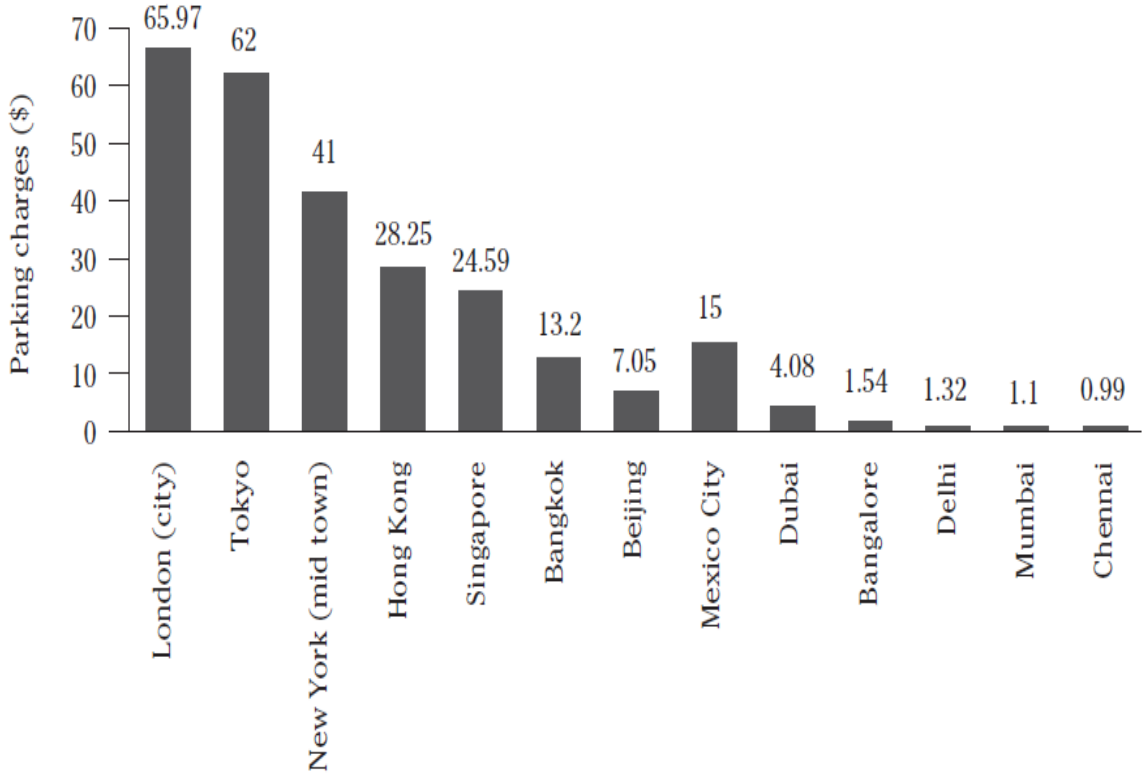
Opt for common and shared parking. Discourage individual – private parking



Reform parking pricing

Global studies show :
Shifting from free to parking rates can reduce automobile commuting by 10-30 per cent especially if linked with other transportation choices

Indian cities have the lowest parking rates in the world

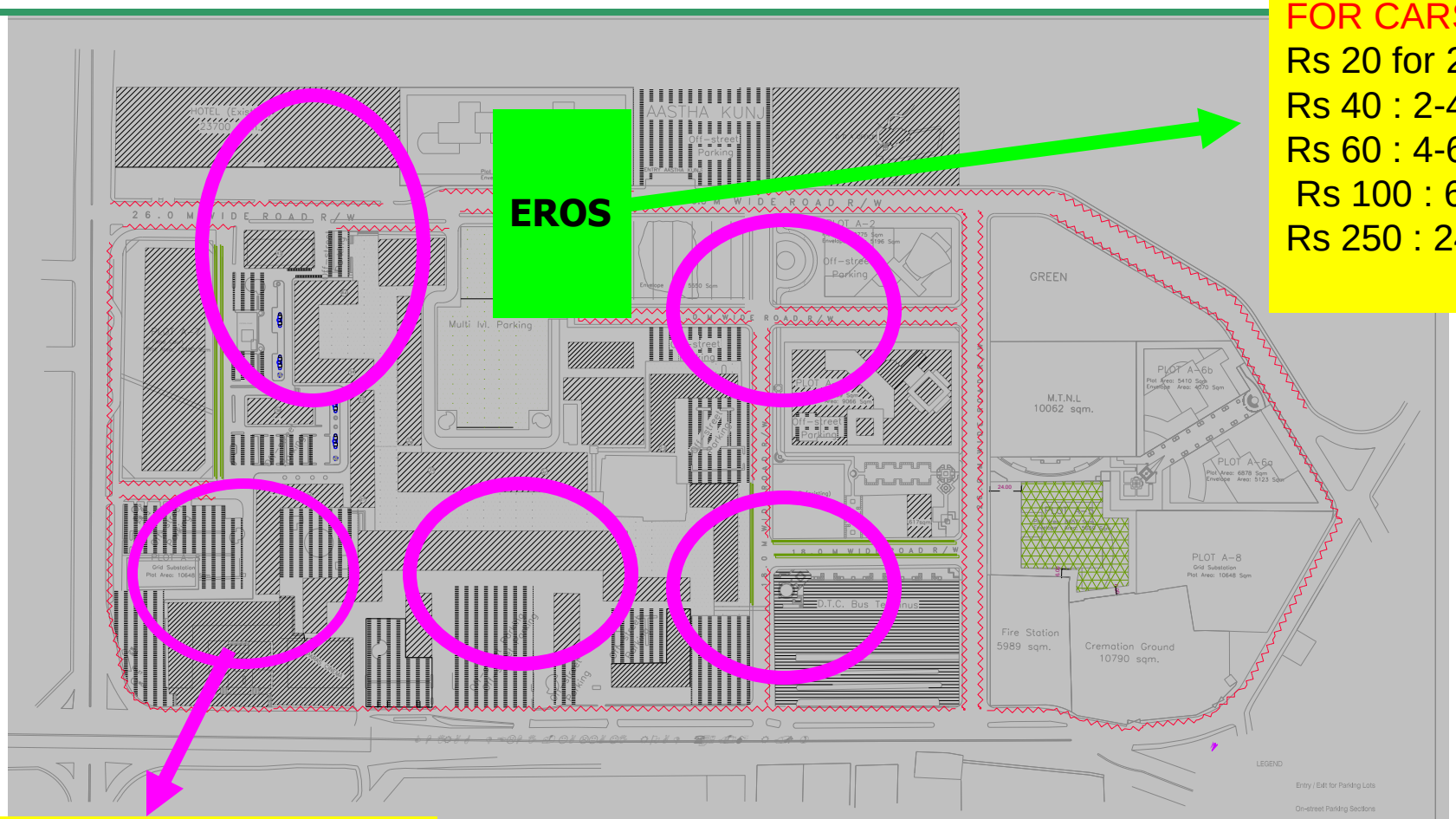


Source: Colliers International (2011) - CBD daily parking charges (in US $)

Irrational parking rates for MLP and surface parking

Integrate management and make on-street more expensive than off-street

FOR CARS
Rs 20 for 2 hrs,
Rs 40 : 2-4 hrs
Rs 60 : 4-6
Rs 100 : 6-10 hrs
Rs 250 : 24 hrs



Car: Rs 10 for 12 hrs
2Ws: Rs 5 for 12 hrs

No "on-street" parking proposed but not implemented

Need parity of rates between structured and surface parking

Mumbai: Discrepancy in rates can lead to underutilisation of MLP

INOX the multiplex in Nariman Point: Before construction of MLP: No. of surface parking spaces: **140,** Utilisation: **100%** during office hours

After: No. of parking spaces: **540,** Utilisation of MLP during office hours: **10%** Parking rates are Rs 5 per 30 minutes or Rs 10 per hour.

Surface parking rates : Rs 5 per hour and Rs 3 for every additional hour.

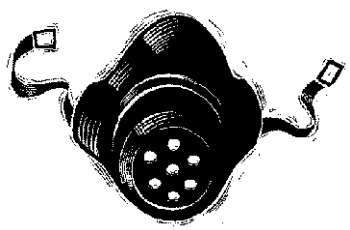
Resolve this

New game in town: Free floor space index (FSI) to builders to builders to create free parking lots.

Poor utilization

Situation in INOX Parking area on 5th May 06 – a weekday at peak time of 11:am

Source: Mumbai Environmental Social Network



Emerging good practices in India

Delhi: MPD 21 links vehicle license to parking space. Rates increased to rs 20 per hour. To increase further

Kolkata: **Only city with residential parking pricing:** Personal vehicles pay night charges for on street parking in neighbourhood with narrow streets.

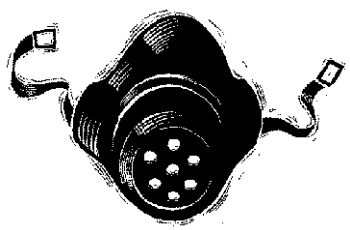
Those who cannot park on roads rent spaces to park cars. They pay in the range of about Rs. 1000-1200 per month. This is similar to Tokyo model

Bangaluru: Bruhat Bengaluru Mahanagara Palike decision in September 2013: New pay and park scheme to be expanded to cover 85 roads.

-- Roads classified into premium parking, business parking and ordinary parking. Hourly tariff is proposed -- Rs 15, Rs 10 and Rs 5 for two-wheelers and Rs 30, Rs 20 and Rs 10 respectively.

-- Provision of yearly revision of parking fee linked to wholesale price index

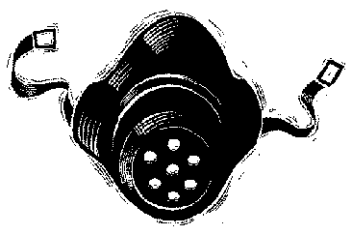
--- Parking Information System and parking meters



Gangtok: demands proof of parking before registration

Sikkim transport department notification makes it mandatory for buyers to **produce an availability-of-parking-space certificate** before registering vehicles

- The superintendent of police issues certificates after physical verification of the parking space
- This is followed by an inspection by motor vehicles inspector, who submits details to the transport department along with a rough map of the site
- In the hills, car owners often park along the road and walk to their houses, which may be located higher up or lower down
- Two car dealers received notices from the transport department directing them not to sell cars without first asking for the availability-of-parking-space certificate

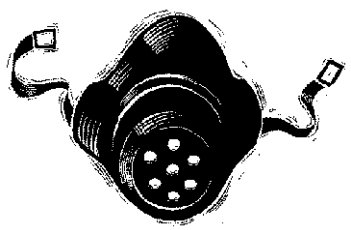


Aizawl: passes law to regulate and control vehicle parking

To own and buy a car…..

- the owner of any type of motor vehicle including two wheelers shall have a garage within his own residential or business compound or in some other place, or a garage hired from any other person, for parking the vehicle (*The Mizoram Gazette, Vol XL, Issue No. 52, February 2011*)

- Purchaser, before purchasing any type of motor vehicle including two wheelers or the person intending to purchase any such motor vehicle shall obtain a certificate from the ….transport department…that he has a garage, within his own residential or business compound or in some other place, or a garage to hire from other person, for parking the vehicle he intends to purchase (*The Mizoram Gazette, Vol XXXIX, Issue No. 295, August 2010*)



Parking revenue for public good

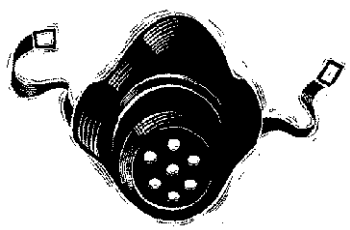
- **Parking revenue to be earmarked to create dedicated urban transport funds under JNNURM**

-- **Periodic license renewal pegged to the market driven parking rates** can be an important source of revenue.

-- **Tax parking spaces at the same rate** – if the land was used for other developments. Offset revenue losses from the other potential uses of the land

-- **Use parking pricing revenue to fund transportation and other local area development**

-- **Primary objective of parking pricing is parking management**. Revenue and local area developments are co-benfits



Other countries are limiting and pricing parking

Capping parking supply

Portland, Oregon Overall cap of 40,000 parking spaces downtown. This increased public transport usage from 20-25 per cent in the 1970s to 48 per cent in mid 1990s.

Seattle allows a maximum of one parking space per 100 square metres at downtown office

San Francisco limits parking to seven per cent of a downtown building's floor area

Parking pricing strategy to reduce car usage. Benefits public transport

New York: Very high parking fees and limited parking supply lowers car ownership far below the US average.

Bogota Removed limit on the fees charged by private parking companies. The revenue goes to road maintenance and public transit improvement.

Shenzhen: Hike in parking fees during peak hours leads to 30% drop in the parking demand.

Bremen: No free parking in city centre. Parking charges higher than public transport cost.

Barcelona– Parking revenue directed to a special fund for mobility purposes.

London: parking income channeled to transportation projects.

Strong enforcement and penalty

Tokyo: Enforcement against parking violations cuts congestion drastically . Private firms allowed to issue tickets for parking violations. This makes on-street parking expensive.

Antwerp: parking fines are invested into mobility projects

Free up public space

Paris: Street space freed for bike sharing and trams

Copenhagen: Streets freed up for bike lanes etc

Cities are moving away from car centric infrastructure…….

Before

After

Seoul's Cheonggyecheon restoration project

Cities that have destroyed roadways

San Francisco

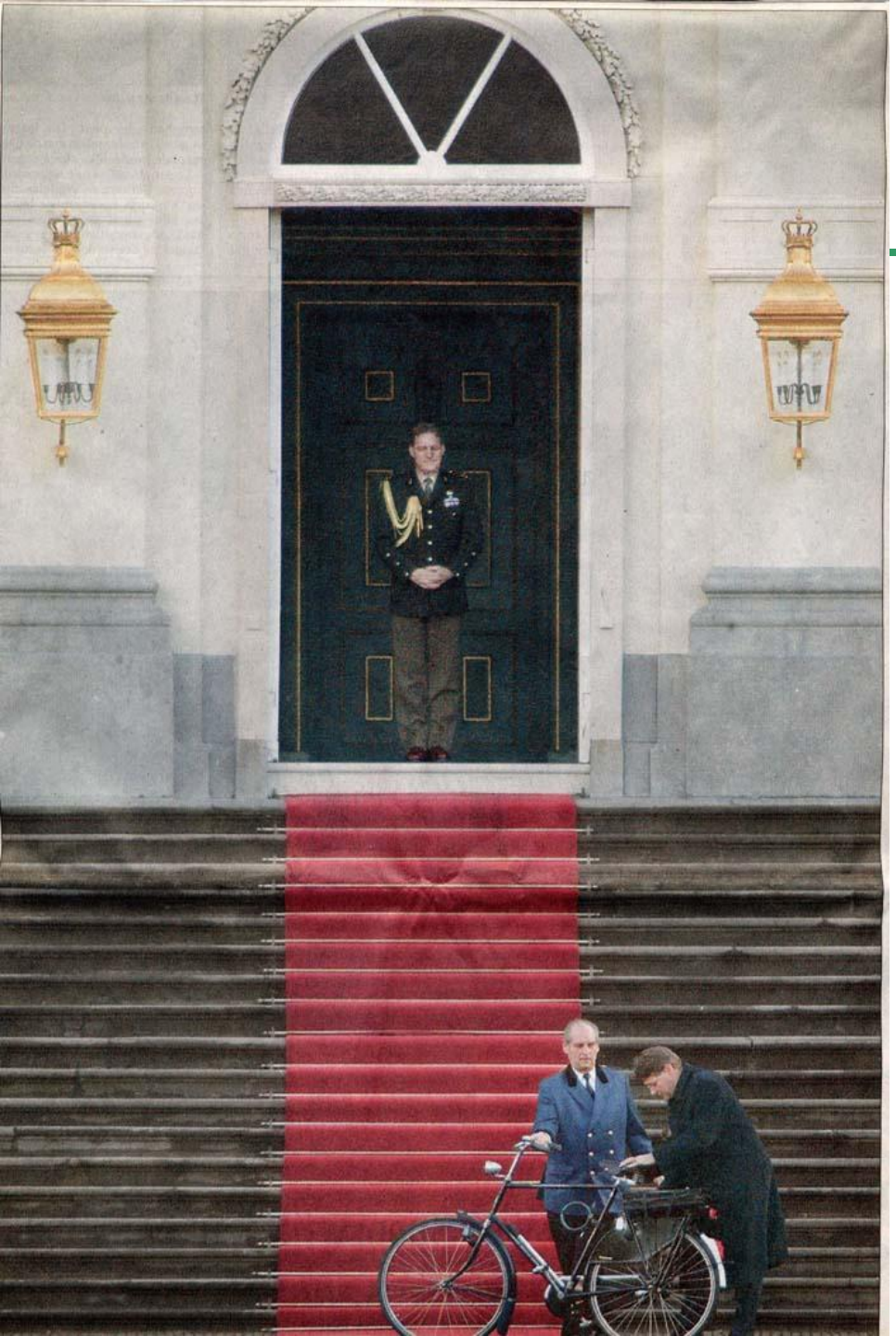
Milwaukee

New York

Portland

Toronto

Seoul



Dutch Minister visits the queen on a bicycle

Source: GIZ

Thank You