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Promoting Rural Livelihoods
Through Sustainable Development

CYCLE
& NMTKOLKATA

The Case

Under the *West Bengal Traffic Regulation Act of 1965* , Kolkata police have barred bicycles from 174 thoroughfares - a blanket ban in effect. The ban includes cycles, cycle vans, handcarts, pull-carts and bakery vans.

The above ban is an extension of the notification issued by the commissioner of police on August 11, 2008, which barred bicycles from plying or standing between 9am and 7pm on 38 thoroughfares of the city, which includes Dalhousie, Esplanade area, Chowringhee Road, Park Street, Shakespeare Sarani, Camac Street , Red Road, Chittaranjan Avenue, Asutosh Mukherjee Road, SP Mukherjee Road, Gariahat Road, MG Road and Ballygunge Circular Road.

The current notification has gone a step further to include -
Most road in Kolkata including Shakespeare Road, BBD Bag etc where non motorized transport is banned for 24 hours and James Long Sarani and Diamond Harbour Road where cycles will be allowed to ply from 2-3pm and from 11pm-6 am and for most other roads it will be banned from 7 AM to 11 PM. It literally means a blanket ban of cycling in the city.

According to Shri K. Hari Rajan, the additional commissioner (traffic) of Calcutta police : Cycling is banned in major thoroughfares of the city for two reasons
- To ensure that traffic flow is not disturbed by the mix of fast-moving vehicles and cycles, as Calcutta has no provision for dedicated cycling tracks.
- There are also security concerns as cycles are often used to plant bombs

(Photo courtesy – allevents.in

Why a ban on cycling makes no sense in Kolkata

For an overwhelming mass of people in Kolkata, as in other Indian cities, Non-motorisedtransport (NMT) is indispensable. Infrastructure for Cycles and other means of Non-motorized transport is imperative for any modern city to remain competitive. Below are the key points why the ban should be lifted and infrastructure to support cycles and NMT. All arguments mentioned below are interconnected and the only solution lies in the promotion of NMT.

Social Inclusion / Equity –

There are important links between transport systems, livelihoods and poverty, especially in developing countries and megacities like Kolkata. Non – motorized transport offers significant benefits to marginal groups such as low income segments, the sick, the elderly, women and children.

Given the wide coverage of the ban across the city, it is clear that the biggest losers will be the overwhelming mass of people who use cycles and pull / hand carts to commute to work or to cover short distances in and across densely populated areas. Additionally these vehicles are also an important source of employment to a significant proportion of the unskilled labour force in the city. Motorized transport is often too expensive for the urban poor and is capital intensive (in that it accounts for a considerable percentage of the monthly household income of BPL families).

A forced shift from non – motorized to motorized transport will have negative consequences on these groups such as:

- Kolkata is the only metropolitan city in India where trips by cycle (11 per cent) outnumber trips by cars (8 per cent) – according to a report by MOUD.

Metro	Walk	Cycle	Public Transport	Cars
Kolkata	19	11	54	8
Delhi	21	12	43	14
Mumbai	27	6	45	8
Chennai	22	9	31	10

Source: Ministry of Urban Development, 2008

- In kolkata 23 per cent own and use bicycle and 49 per cent do not own vehicles

- Kolkata has the lowest number of private cars and the least amount of road space (6 per cent) among metro cities. Even smaller cities like Gwalior have more registered motor vehicles than Kolkata. Making Non motorized transport the most convenient way to commute – taking the least amount of road space.

- Data of the Union Ministry of Urban Development shows people in Kolkata make nearly 2.5 million cycle trips a day, second only to Delhi. From petty traders and suppliers to carpenters and masons, from the milk man and newspaper vendor to office clerks and courier delivery boys, the middle- and lower-middle classes depend on cycles.

- Approximately, the minimum cost of public transport accounts for 20 to 30 percent of the family income of those living in slums in the city. Given that 50 to 75 percent of commuter trips for those in the informal sector are accounted for by cycling or walking, such a ban will only make matters worse with a significant proportion of these commuters being forced to rely on motorized transport

Economy

Kolkata Petrol Price change since May 2013	
September 01, 2013	81.57 Rs/Ltr
August 01, 2013	78.64 Rs/Ltr
July 15, 2013	77.76 Rs/Ltr
June 29, 2013	76.1 Rs/Ltr
June 16, 2013	73.79 Rs/Ltr
June 01, 2013	71.29 Rs/Ltr
May 01, 2013	70.35 Rs/Ltr

Source: http://www.mypetrolprice.com/4/Petrol-price-in-Kolkata?FuelType=0&LocationId=4

- The people of the city are already reeling under severe economic duress due to an increase in fuel costs. The ban is especially surprising as the state government has continually opposed increases in petrol prices. In the last two months alone, there have been six petrol hikes, while diesel prices have been hiked eight times since January. In Kolkata, after the last petrol hike the price is Rs. 81.57, while diesel prices have risen to Rs. 56.33.

- India imports more than three-fourths of the crude oil it requires. Fuel subsidies were a record high of Rs 1.6 lakh crore in 2012-13, putting increasing pressure on the fiscal deficit.

Urban Infrastructure/ Congestion -

- India's urban population is expected to grow from 285 million in 2001 to 820 million by 2051.

- With a population of over 14 million, urban agglomeration of Kolkata is among the third most densely populated in the country. At least 7,750 people live in one sq km area. Kolkata has highly concentrated population (over 14 million), limited road infrastructure and dense inter – mediate transport networks meant for Non motorized transport. The city has therefore always had a history of walking and cycling in order to cover short intercity distances.

- Cycles do not slow down vehicular traffic. Average speed of traffic in Kolkata varies between 14-18 km/ hour. This speed can be easily matched by the cycle

Safety and Health –

- Traffic accident data for West Bengal (2011) shows only 1.5 per cent of road accidents happen due to fault of cyclists against 71 per cent due to faults of motor vehicle drivers.

- According to the Road accidents in India Report 2010 from Minsitry of Transport, India Total Number of Road Accidents in India classified according to Cause of Accidents: 2010. 33,355 are caused by the fault of the driver leading to 12,002 deaths and 37,232 injuries and only 275 caused by the fault of cyclist leading to 77 deaths and 260 injuries.

- While Pedestrians, Cyclist and Motorised two wheelers are the most vulnerable groups on Indian roads, Death of pedestrians and motorized two wheelers far outnumber the deaths of cyclists.

- Kolkata is the 'lung cancer' capital of the country, accounting for more deaths due to lung cancer and heart attacks than any other city in the country. Seven out ten people suffer from various kinds of respiratory diseases due to air pollution. A key finding from a CNCI study (Chittaranjan National Cancer Institute) establishes a direct link between air pollution among the inhabitants of Kolkata and the high incidence of lung cancer. Kolkata tops all Indian cities when it comes to lung cancer - at 18.4 cases per 100,000 people - far ahead of Delhi at 13.34 cases per 100,000.

- A six year study by CNCI Kolkata has shown of the 70 percent of city inhabitants suffering from respiratory diseases, the most exposed groups are hawkers, commuters, public transport drivers, traffic policemen and shopkeepers.

Pollution and Environment

- WBPCB indicates that automobiles account for nearly 50 per cent of the air pollution load.

- Kolkata is the most polluted metropolitan city in the country and is around 2.5 times more dangerous than the capital city of Delhi. (Report from India Today). According to statistics released by the Scientific and Environmental Research Institute, Kolkata has a suspended particulate matter (SPM), the measure of pollution, at a steep 511 compared to Delhi's 234 and Mumbai's 322.

- A report released by CSE on *'Air Quality and Mobility in Kolkata'* shows that the city is under a major mobility and multi pollutant crisis. Several areas in Kolkata have already been classified as 'critical' or high concern areas in terms of air quality as per nitrogen dioxide levels and particle matter (PM) levels.

Areas in Kolkata as per levels of Air Pollutants				
Locations	Nitrogen Dioxide		PM10	
	Previous air quality status	New air quality status	Previous air quality status	New air quality status
Salt Lake	High	Critical	High	High
Moulali	High	Critical	High	High
Minto Park	High	Critical	Moderate	Moderate
Lal Bazar	High	Critical	Critical	Critical
Kasba	Moderate	Critical	Critical	Critical
Dunlop Bridge	Moderate	High	Moderate	High
Cossipore Pol Stn	Moderate	Critical	Critical	Critical
Behala Chowrasta	Moderate	Critical	Moderate	High
Baishnabghata	Moderate	Critical	Moderate	Moderate

- *Source: CITIZEN'S REPORT AIR QUALITY AND MOBILITY IN KOLKATA*

Bicycles can compete with the "faster means of transportation" eg cars" that are expensive, guzzle energy, and cause pollution and traffic jams. Bicycles are inexpensive; take much less space, good for the environment, and least likely to cause jams and accidents. The added bonus: cycling is a good exercise and a fun way to get around the city.

KOLKATA, ONLY METRO WHERE CYCLE TRIPS OUTNUMBER CARS'
Mode of transport in % share

	Walk	Cycle	Public transport	Car
Kolkata	19	11	54	8
Delhi	21	12	43	14
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Chennai	22	9	31	10

Source: Ministry of Urban Development, 2008

CYCLISTS ARE RARELY BLAMED FOR ACCIDENTS IN WEST BENGAL

	No.	% share
Total accidents	14,945	100
Fault of driver	10,621	71
Other causes	2,109	14.1
Defect in condition of motor vehicle	783	5.2
Fault of pedestrian	557	3.7
Defect in road condition	459	3.1
Fault of cyclist	222	1.5
Weather condition	194	1.3

Source: Ministry of Road Transport and Highways, 2012

MOTOR VEHICLES ARE NOT POPULAR IN KOLKATA

Number of motor vehicles
as on March 2011

KOLKATA	DELHI	CHENNAI	MUMBAI	GWALIOR
444,700	7,227,700	3,455,800	1,870,300	449,300

VERY FEW IN KOLKATA HAVE PRIVATE CARS

	2011	2007	2005
Kolkata	194,178*	383,047	345,503
Delhi	2,116,107	1,536,897	1,108,045
Mumbai	562,526	436,586	382,898
Chennai	598,708	423,360	366,490

Note: *Number of cars in Kolkata dropped after cancellation of vehicles registered prior to January 1993 Source: Road Transport Yearbook.
Courtesy – Down to Earth (Above graphs)

National Urban Transport Policy (NUTP) – Ministry of Urban Development, GOI

Union ministry of Urban Development - through its National Urban Transport Policy (NUTP) - is pushing to increase the share of both public and non-motorised transport and promoting bicycles as the fittest means of commute
http://moud.gov.in/sites/upload_files/moud/files/pdf/TransportPolicy.pdf

Key objectives:

- Incorporate urban transport as an important parameter in urban planning
- Bring about more equitable allocation of road space with people rather than vehicles as the main focus
- Encourage greater use of public transport and non-motorized modes of transport

The National Urban Transport Policy advocates – **"Priority to non-motorized transport"**

- The Central Government would give priority to the construction of cycle tracks and pedestrian paths in all cities, under the National Urban Renewal Mission (NURM), to enhance safety and thereby enhance use of non-motorized modes. Cities would also be encouraged to explore the possibility of a public bicycle program, where people can rent a bicycle for use in specially designated areas
- Levy of a high parking fee, that truly represents the value of the land occupied, should be used as a means to make the use of public transport more attractive. Preference in the allocation of parking space for public transport vehicles and non-motorized mode as well as easier access of work places to and from such spaces would go a long way in encouraging the use of sustainable transport systems. Park and ride facilities for bicycle users, with convenient inter-change, would be another useful measure. Simultaneously, a graded scale of parking fee, that recovers the economic cost of the land used in such parking, should be adopted. The objective would be to persuade people to use public transport to reach city centers.
- Non-motorized modes are environmentally friendly and have to be given their due share in the transport system of a city. The problems being faced by them would have to be mitigated.
- First of all, the safety concerns of cyclists and pedestrians have to be addressed by encouraging the construction of segregated rights of way for bicycles and pedestrian. Creative facilities like shade giving landscaping, provision of drinking water and resting stations along bicycle corridors would also be encouraged as they can mitigate, to a large extent, adverse weather conditions. The use of the central verge along many roads, along with innovatively designed road crossings, seems to offer promise for being developed as cycle tracks.
- It has been the experience that many such cycle tracks and pedestrian paths do not get used as initially envisaged. However, a view has been that this is because these facilities are designed badly and without fully recognizing the limitations and problems faced by cyclists or pedestrians. It would, therefore, be essential that such facilities be constructed after an open debate on the designs with experts and the community that is expected to use them.

Planning Commission WG on Urban Transport

According to the Planning Commission – Working Group on Urban Transport Recommendation for the 12th Five Year Plan

http://planningcommission.nic.in/aboutus/committee/wrkgrp12/hud/wg_%20urban%20Transport.pdf

The urban transport scenario in Indian cities, today, is headed in the wrong direction. All categories of road users are facing problems in commuting.

- The pedestrians do not get a safe, conflict-free and obstruction-free path to walk.
- The cyclists have to fight for the right-of-way with fast moving motorized modes of transport, many a times risking their lives.
- The user of public transport faces long waiting periods, uncertainty in travel time and difficult conditions of travel.

The urbanization is growing rapidly. From 28% population in urban areas in 2001, it is projected thatby 2031 about 40% population i.e. about 600 million people would be living in urban areas. However, provisioning of urban services has not kept pace of urbanization leading to a situation of chaos and gridlock in most of the cities and also in many of smaller cities and towns

The working group of the planning commission in its report states that - "Because of lack of good quality public transport options, last mile connectivity as well as lack of safe infrastructure for non motorized transport (NMT)– pedestrianisation & cycling. The use of sustainable modes i.e. mass rapid transit (MRT) and NMT i.e. walk; bicycle and cycle rickshaw is on a decline. Instead the use of low-capacity and unsustainable modes, i.e. personal car and 2-wheelers is rising. These modes are uneconomic and socially wasteful in the use of road space and are grossly polluting. The resulting imbalance in the use of road space is leading to increasing road congestion, falling journey speed, increasing air and noise pollution and reducing road safety. Fuel, of which a large part is imported, is wasted despite the fact the import prices of petroleum products persist at a level high enough the hurt Indian economy. GHG emissions are also a global concern. There is a general degradation in the quality of life, city efficiency and its economic potential"

10 goals have been identified in the 12th Five Year Plan (FYP) in line with the National Urban Transport Policy-2006 (NUTP-2006)

1. To create an effective institutional and Implementation framework that will manage the huge investments envisaged;

2. To build capacity of state and city officials and other stakeholders-today hardly any state or city has an urban transport professional on its roles;

3. To create facilities for walking and cycling in all 2 lac+ cities and State capitals-these are non-polluting modes that do not use fossil fuels and provide social equity;

4.To develop an upgraded cycle rickshaw as an integral part of the last mile connectivity for city wide public transport network–this is a non-polluting mode that does not use fuel and provides employment.

5. To augment public transport with part funding from Government of India so as to:

    a. Introduce organized city bus service as per Urban Bus Specifications issued by MOUD in all 2 lac+ cities*1and State capitals;

    b.Add BRTS @ 20 km/1 Million population in 51 cities with population> 1Million*;

    c. Add rail transit @ 10 km/Million Population, start planning rail transit projects in cities with population in excess of 2 Million*, and start construction in cities with population in excess of 3 Million*. The estimated financial progress during the 12thplan period is envisaged at 25% of total cost;

    d.Expand rail transit in existing mega cities i.e. 4 Million +, @ 10 km per/yr. i.e 50 km in 12thFYP,

    e. Provide Suburban rail services in urban agglomerations with population > 4 Million*;

    f. Improve and upgrade Intermediate public transport vehicles and services.

6. To improve accessibility and mobility in cities through:

    a. Developing hierarchical road network in newly developing areas

    b. To complete 25% of major road network in all 2 lac* + cities with missing links including opening up of dead end roads for better utilization

    c. To improve and maintain road surface to the highest standards with good drainage. To regulate and coordinate Work of utility agencies. Today utility agencies do not hesitate in cutting up the road for their work as and when they like and leave it unrepaired or badly repaired.

7. To provide grade separated entries and bye-passes for through traffic;

8. To improve road Safety and security against vandalism, crime and terrorism–introduce a system of safety audit;

9. To use technology for multimodal integration, enforcement and traffic management;

10. To promote innovation, research and development in guided transport; and to support pilot projects with 100% funding from Government of India

Transportation Expert Opinions

UNEP - Low Carbon mobility in india and the challenges of social inclusion
"An increasing number of transport planners have started believing that a transport system that prioritizes walking, cycling, shared and public transport is equitable as well as low-carbon. The top-down transportation planning approach has not really taken into account the needs of the urban poor "

Prof. Geetam Tiwari of IIT Delhi says "All metros should have a bicycle master plan because it has huge potential. We all know about the problems of climate change,"

World Bank – Urban Transport in India Report
"To keep cities competitive, and thus sustain and accelerate economic growth, cities must provide efficient urban transport systems"

In a Guidebook for city planners and Practioners by **IIM Ahmedabad and Centre for Urban equity** – they prescribe the following steps -
• Improving access
• Feeder systems
• Frequency
• Integration
• Electronic ticketing
• Adding footpaths
• Dedicated bicycle lanes
• Park and ride facilities
• Car parks near stations/bus stops
• Incentivize NMT

UNEP BRT Summary Report states " There is a need to improve safety and convenience for pedestrians, bicyclists and cycle rickshaws, in order to retain the current modal share and attract potential users from other modes of transport who are using motorised vehicles for short trips

According to a study done by UNEP - Bicycle ownership is very high in all Indian cities. Approximately 35–65% of households in most medium and large cities own one or more bicycles, according to the Census in 2001, whereas in smaller cities, it varies between 33–48% (the exception being Mysore, with only 27% of households owning bicycles). There are 54.43% of households in Ahmedabad, and 63.4% of households in Chandigarh owning one or more bicycles. In Delhi, 37.6% of households owned bicycles in 2001

http://www.unep.org/transport/lowcarbon/Pdf%27s/BRT_PolicySummary.pdf

Cycling picking up across India

Delhi – The Delhi Master Plan 2021 recommends cycle tracks for all roads.
- In Delhi, the cyclists extensively use the cycle tracks
- Delhi BRTS has provided cycle-renting schemes in some locations. nine bicycle stands are built along the Bus Rapid Transit (BRT) corridor.nominal charges-Rs 10 for the first four hours and Rs 5 for every subsequent hour-the bright green bicycle stands not only allow commuters to rent bikes but also park them.

Mumbai - Even the busy city of Mumbai is encouraging cycling -In 2011, Maharashtra Chief Minister Prithviraj Chavan inaugurated the city's first cycling track at Bandra – Kurla Complex (BKC). The Mumbai Metropolitan Region Development Authority (MMRDA) built 12-km track is expected to encourage more city dwellers to use bicycles to commute to work, and ease congestion on the roads.

Chandigarh Constructed 160 km of wide cycle paths between 2001 and 2003

Supreme Court - In 2012 the Supreme Court quashed the plea of the civic authorities of Delhi to regulate and cap the number of cycle rickshaws to ease road congestion. In the landmark case filed by Delhi non-profit Manushi, Justice G S Singhvi asked the government counsel, "Do you dare confiscate and junk cars, the way you do with rickshaws? Do you even dare confiscate and destroy cars of those owners who indulge in drunken driving and mow down people? We know your mindset and how you treat the poor."

Bicycles are back in fashion in the "WEST" (that we love to copy)

Photo Courtesy – Bikehub.co.uk

Cities across the world are rediscovering bicycles. Pushed by
- Increasing fuel costs,
- Compulsion to reduce commuting time,
- Environmental concerns,

and the need to make cities livable, many are back on better wheels.

European commission Report – **73 % of Europeans think that bicycles should benefit from preferential treatment compared with cars.**
(http://ec.europa.eu/environment/archives/cycling/cycling_en.pdf)

London Mayor's vision for cycling released in March 2013. "Cycling will be treated not as niche, marginal or an afterthought, but as what it is: an integral part of the transport network, with the capital spending, road space and traffic planners' attention befitting that role," wrote an excited Boris Jonson, "... at the very heart of this strategy is my belief that helping cycling will not just help cyclists. It will create better places for everyone. It means less traffic, more trees, more places to sit and eat a sandwich. It means new life, new vitality and lower crime on underused streets. It means more seats on the Tube, less competition for parking place and fewer cars in front of yours at the lights."

CYCLE AND NMT   KOL

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Worlds Happiest Countries Ride a Cycle – A case of Denmark and Netherlands

Netherlands is the biggest user with biking accounting for 30% of daily commuting, followed by Denmark, at 20%. It may not be a total coincidence that the people of these two countries rank among the top in the happiness index of the Gallup 2010 survey.

Amsterdam, the densely populated capital of the Netherlands, with a population of 800,000, boasts of 880,000 cycles.

The policy changes in both Denmark and The Netherlands have resulted in shifts in modal shares over time. In both countries, as shown in graph below , the modal share of bicycles had constantly declined until the 1970s. However, with the help and combined efforts of the community and government, the trend has been reversed over time, despite the harsh climatic conditions in the countries (rain and cold winters)

Trends in bicycle use in The Netherlands and Denmark
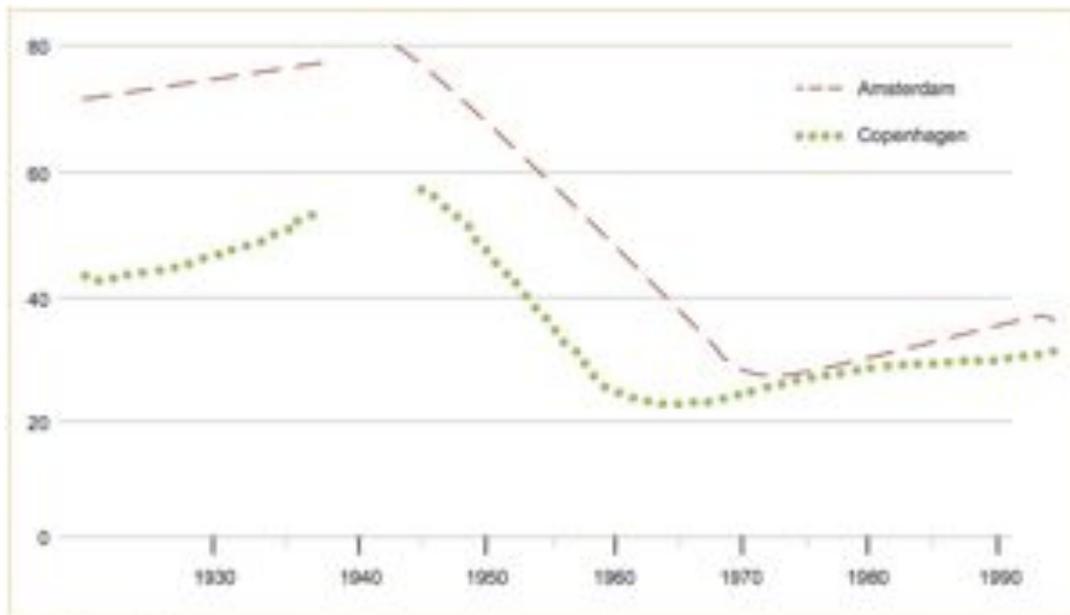
Source: Fervsai 2000

In Denmark fatalities of bicyclists have reduced by 35%, and in The Netherlands bicycling has increased by 50% between 1980 and 1997. In Copenhagen, about 37% of the residents bicycle, resulting in 90 ,000 tons of CO_2 emissions reduction per year (Kim and Dumitrescy 2010).

On average, 19% of the trips in The Netherlands are being made by bicycles and 27% by walking, during which a person cycles for 1,000 km and walks for 250 km per year. This is attributed to the development of appropriate Non motorized Transport (NMT) infrastructure that is well integrated with public transport, along with strong cultural and political will.

In Denmark, car use increased up until the 1970s,before reorienting transportation policies like provision of limited parking for automobiles in city area to give priority to bicycling and walking. Other land use policies in the city of Copenhagen, such as allocating work space near P, have also been encouraged.

Bicycle traffic in Copenhagen prevents 90,000 tons of CO2 from being emitted annually.*City of Copenhagen, 2006* - Bicycle Account, 2006

Car waits for bicyclists to pass before turning right, in Denmark

Source: Fischer et al., 2010

Non Motorised Trasport Infrastrcuture in a developing country – Bogota, Columbia
A new transport model for the city of Bogota was planned with an objective to alleviate poverty and promote social justice. Subsequently, an intensive 300 km long network for bicyclists was planned, and infrastructure for both pedestrians and bicyclists have been integrated with the public transport system. In terms of improvement in bicycle infrastructure, these changes have caused a modal shift towards bicycles from 0.9% to 4%. Also, the development of appropriate infrastructure has resulted in reduced carbon monoxide levels in the city by 28% between 1998 and 2002 (Santos et al., 2010).

Many Asian cities are actively promoting Cycling— Changwon in South Korea offers financial incentives to bolster cycle use; Hangzhou in China has a vast network integrated with the bus system; and Yogyakarta in Indonesia has introduced an accident insurance scheme to encourage cycle users.

Issue of Space -
As learned from various experiences, there was a need to have equitable allocation of road space to different types of users. Also, there was a need to first allocate space to pedestrians, bicyclists and public transport, and then to personal MV users, in order to promote and encourage the use of a sustainable transport system in the city. Thus, the existing infrastructure needs to be redesigned, as has been done in the case of the Delhi BRT corridor.

The transportation sector is responsible for 71% of all U.S. petroleum use.*Bureau of Transportation Statistics, 2010*

Energy Information Administration Monthly Energy Review, U.S. Department of Energy, in Transportation Statistics Annual Report 2010, 143- See more at: http://www.bikesbelong.org/resources/stats-and-research/statistics/environmental-statistics/#sthash.gGI98AgB.dpuf

Solutions

The solutions to a non-motorized transport (NMT) ban lie deep, in holistic sustainable urban planning. Planning for a cycle or non-motorized transport infrastructure cannot be done exclusively - without looking into public transport and pedestrian & cycle oriented infrastructure and better traffic management. In total we need to look into the design of the city that makes it convenient and safe to walk, cycle, take services of non-motorized transport and use public transport – which is frequent, fast, comfortable, safe and reliable . All these measures will reduce the dependence on personal motor vehicles – rise of which is making our cities congested, unsafe and polluted. And our country more dependent on imported fuel (which has a adverse effect on our economy , and on the common man's budget – especially effecting the poor.

In Kolkata – Non-motorized transport systems are the most common vehicles owned by households, infrastructure related to bike paths, pedestrian walkways and non motorized and mass transit facilities should be provided.

Focusing only on Non motorized infrastructure -

- Non-Motorized Transport Cell (NMT Cell) like the Pune Municipality NMCT which has also set a target of Modal Share for 50% Non Motorised Transport and 40% Public Transport.

- Cycle Tracks on all arterial roads – as suggested by TRIPP, IIT Delhi . Improvements within the road geometric design with compulsory cycle tracks and walkways along the major arterial road will enhance the speed of all vehicles. Cycle tracks on all roads may not be possible to begin with, but we must start to identify arterial roads that can be redesigned to accommodate cycle tracks. These tracks should be well connected and should be created into a city-wide cycle track network and ensure cycle-safe streets. This will encourage more people to take up cycling. Such an infrastrucutre should be carefully designed to ensure they are Bicycle friendly – eg Secure Bicycle Parking Facilities, Smooth surfaces of cycle lanes and adequate shading elements

- Public Bicycle Scheme / Cycle sharing system - Cycle Feeder & Rental Scheme As suggested by GOI Ministry of Urban Development.   - The cycle feeder and rental scheme, will Integrate public transport with an emission free Non-Motorized Public Transport Feeder Network. This should include dense network of stations across the coverage area, with a spacing of approximately 300 m between stations across the metro connection. Such a dense network of cycling or non motorized transport in short and direct connections will improve access to public transport. Cycles, Cycle rickshaws and hand pulled rickshaws will support the need of the city considering the narrow streets and the required maneuverability.

- Consultation and Capacity Building – as taken up by ICE Netherlands, GTZ etc – The city will need to consult and bring on board various stakeholders - Traffic police, Users, Cyclists, Urban Design experts, Transporting Design experts, Global cycle planning experts, Researchers etc. for consultation and capacity building on Design Guidelines for planning and implementing cycle-friendly infrastructure . Ministry of urban development, Govt of india will play a pivotal role in the Institutional Mechanisms, Capacity-building and Financial Planning for implementing the plan.

- Promotion, Awareness and Education Campaigns on use of bicycle and other non motorized transport and to look into safety will also be important

A number of guides and resources including ADONIS (1998), Litman, et al. (2000), NYBC (2002), GDOT (2003) provide information on best practices for improving non-motorized travel conditions and encouraging non-motorized transport.

- Integrate-motorized planning into all transport and land use planning activities;
- Educate all transportation professionals in non-motorized transport planning principles;
- Fund non- motorized planning at a comparable rate as other travel modes;
- Ensure that all roads are suitable for walking and cycling unless these modes are specifically prohibited and suitable alternatives are available;
- Use current planning practices and design standards, including
- Universally Accessible Design;
- Include non-motorized travel in transport surveys and models;
- Create pedestrian-oriented commercial centers and neighborhoods;
- Perform user surveys to identify problems and barriers to non-motorized travel

Other improvements recommended by Planning Commission – Working Group on Urban Transport

- Improve sidewalks, crosswalks, paths and bike lanes;
- Correct specific roadway hazards to non-motorized transport (sometimes called "spot improvement" programs);
- Improve non-motorized facility management and maintenance, including reducing conflicts between users, and maintain cleanliness;
- Develop pedestrian oriented land use and building design (New Urbanism);
- Increase road and path connectivity, with special non-motorized shortcuts, such as paths between cul-de-sac heads and mid-block pedestrian links;
- Street furniture (e.g., benches) and design features (e.g., human-scale street lights); traffic calming, streetscape improvements, traffic speed reductions, vehicle restrictions and road space reallocation;
- Safety education, law enforcement and encouragement programs; Integrate with transit (Bike/Transit Integration and Transit Oriented Development);
- Provide bicycle parking;
- Address security concerns of pedestrians and cyclists;
- Public Bike Systems (PBS), which are automated bicycle rental systems designed to provide efficient mobility for short, utilitarian urban trips;
- Pedestrians-ways, which are indoor urban walking networks that connect buildings and transportation terminals;
- Create a Multi-Modal Access Guide, which includes maps and other information on how to walk and cycle to a particular destination;
- Provision of multi-storey car parks for residents in order to gain public space on the road and gradually reducing parking space on the streets in order to promote cycle and walking;
- Monitoring of the public parking space with a special control task force;
- Additional park and ride facilities at the periphery of the city.