NPTEL ONLINE CERTIFICATION COURSE

ECOLOGY AND ENVIRONMENT

**Promoting Policies for Eco-Productive
Cities in the Global South – Part 2**

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So, this is a familiar sight in many developing countries and if you would ask the question what is wrong with this picture?

The first thing that people would say is there is too much congestion, it is too many vehicles on the road, and people countries and the vehicles do not have any room to grow, to move.

Now, it turns out that if you actually pay closer attention to this picture, you start to see that the bulk of the people are actually traveling in these buses on the roads, and a few in two-wheelers, in the cars and other private vehicles, you actually have fewer vehicles, fewer persons and they end up taking a lot of the road space. So, it is congestion is not really the problem, access turns out to be the problem, transport is really a means to serve our needs for access to goods and

services, so if you keep focusing on the problem of mobility and congestion, we are actually missing the larger picture around transport.

Congestion is NOT the problem!

- Access is the problem: transport is merely a *means* to serve our needs for *access* to goods and services
- In India, the barriers to access have mainly to do with poor pedestrian and bicycle facilities, lack of independent, grade-separated lanes for public transport, and bad conditions for inter-modal changes (e.g., outside metro stations)

The transport problem has largely been ill-defined in terms of how many kilometers or passenger kilometers need to be accommodated, but the real question is how do people access the place of work, how do they end up going, getting their goods and services, how do they send their children to school and so on. And these problems are actually solvable through a mixture of the network of roads, and modes through which transport is organized and the way in which land-use itself is organized, and so that is a rather complex integrated problem, but it is not usually seen as such.

In India, the barriers to access have largely got to do with the fact that there is poor pedestrian and bicycle facilities, a lack of independent grade-separated lanes for public transport and bad conditions for intermodal changes. So that even if you have systems like the metro and train stations and so on, there is very poor connections between train stations and other modes and people usually have to walk or take a bus to get to a metro station, and those connections and those services are very poorly organized.

A Liveable Street Looks Like This

1. Wide sidewalks
2. Mixed Land Uses
3. Safe cross-walks
4. Exclusive Bus Lanes
5. Exclusive Bike Lanes

Source: https://sf.streetsblog.org/2009/04/09/livable-streets-promised-land/

In an ideal case, the livable street would look something like this where you have a variety of features that are very, very significant. First of all you would have wide sidewalks, and wide sidewalks are important because the bulk of the people would need to walk and this facilitates the use of a mode of transport that takes up the least amount of energy, it is actually good for you and reduces traffic on the roads as a result, if more people were to walk there will be less traffic on the roads, especially for short distances. A second feature would be, what I had mentioned earlier having mixed uses, mixed land uses so you have houses and shops and commercial establishments and other features close to each other, so you do not have to travel very far, and you could essentially walk to those places. You would also have safe crosswalks for pedestrians again a pedestrian-oriented street design would change the quality of transport, the quality of life on the streets. And then you have exclusive bus lanes, in this case, you have a lane that is grade separated you see these barriers so that the buses are not impeded as in the previous picture by other vehicles.

And then you also have exclusive bicycle lanes over here, and that provides access to another sustainable mode of transport namely a non-motorized mode of transport namely bicycling, and then you have your cars having less road space certainly, but only those who absolutely need to use cars would use them in any case.
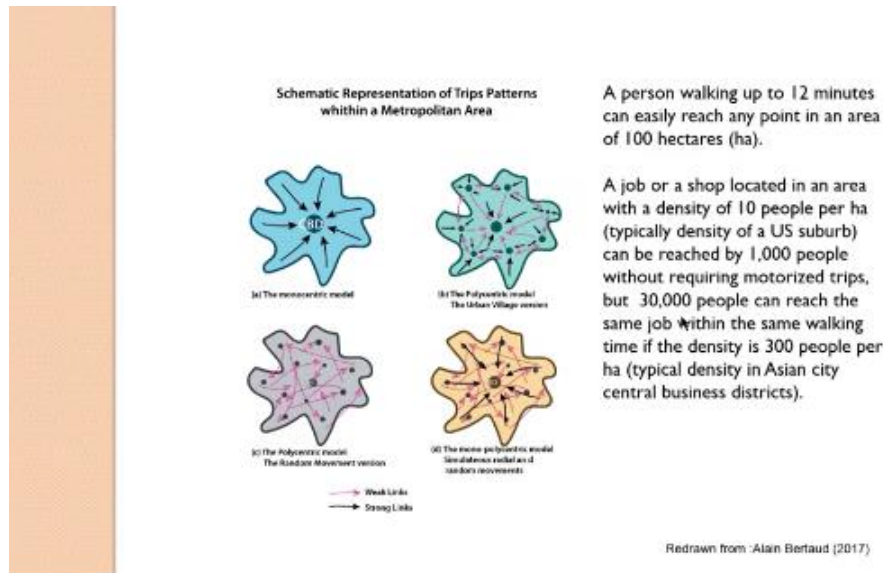
Can we get there from here?

- Yes, but it requires changes in technology, planning, and lifestyles
- Technology: Bus Rapid Transit, human-scale engineering for grade-separation
- Planning: Mixed-use growth, Transit-Oriented Development, Inter-modalism
- Lifestyles: Shifting attitudes to believe that Walking and Bicycling are good for health and cities. Focus starts at the bottom end – on the poorest and neediest users.

So, the question is can we get from the image that I showed you over here to here, and this is not a straightforward issue, it requires changes in technology, requires changes in planning, changes in attitudes about planning and of course, also some changes in lifestyles. In terms of technology, bus rapid transit which involves the use of buses having exclusive and grade-separated lanes is been a very successful experiment around the world particularly in Latin America, but also many parts of Asia including in India and this requires human scale engineering for great separation.

In terms of planning, we need to focus on mixed-use, land-use growth and something known as transit-oriented development that is planning cities so that around transit, planning cities around bus stops, bus stations, train stations and so on.

And the third feature would be what is known as inter-modalism making sure that the connections between these different modes buses and trains allowing bicycles and the trains and buses is one way of promoting inter-modalism and so on. And certainly making sure that you have wide enough pedestrian sidewalks so that people have access to these different public transit modes.

And finally lifestyles, so we certainly need a change in attitudes from a sort of a some privileging private vehicles to believing that walking and bicycling are good for health in cities and that is in fact borne by the evidence by scientific evidence. The focus needs to start at the bottom end on the poorest and neediest users, so planners need to really think around who their neediest users are, rather than who their elites are, and as I mentioned earlier there tends to be a focus on the needs of the elites whereas that really needs to be reversed, its upside down, we need to really focus on the needs of the neediest people.

Schematic Representation of Trips Patterns whithin a Metropolitan Area

(a) The monocentric model

(b) The Polycentric model
The Urban Village version

(c) The Polycentric model
The Random Movement version

(d) The mono-polycentric model
Simultaneous radial and random movements

Weak Links
Strong Links

A person walking up to 12 minutes can easily reach any point in an area of 100 hectares (ha).

A job or a shop located in an area with a density of 10 people per ha (typically density of a US suburb) can be reached by 1,000 people without requiring motorized trips, but 30,000 people can reach the same job within the same walking time if the density is 300 people per ha (typical density in Asian city central business districts).

Redrawn from : Alain Bertaud (2017)

Now cities tend to have different networks, different ways in which transport systems need to be organized. And the traditional city used to be called a mono-centric kind of city where there is a central business district and people used to live further out, and all of them used to end up coming to the CBD, and that is the way in which many cities were planned in the early and mid-parts of the 20th century. But that is changed quite a bit to these different patterns, the polycentric pattern is one where you have multiple centers, and the CBD is just one among many and people may end up going to those other centers, you also have one where the CBD is even smaller, and people could be traveling across to multiple centers and living elsewhere. And then you have what is known as the mono-polycentric model where you have a strong tendency towards the CBD, but you also have a lot of simultaneous random movements across other places on the outskirts or away from the CBD.

Now there is some rules of thumb about planning for public transport. A person who can walk for up to 12 minutes can easily, should easily be able to reach any point in an area of 100 hectares, a job or a shop located in an area with the density of 10 persons per hectare can be reached by about a thousand people without requiring motorized trips, but 30 thousand people can reach the same job within walking distance of the densities around 300 people per hectare. Now, it turns out that typical Asian city has a very high density and planning should, therefore, make it much easier for people to reach their destinations by walking alone. So, walking and bicycling typically ought to be sufficient for the bulk of a city's population in Asian cities, but clearly that is not happening partly or largely because the infrastructure has not been designed around bicycling and walking.

Apart from density, how streets are connected to one another also matters for transport sustainability – hierarchical disconnected networks with cul-de-sacs are much harder to support public transport and walking than connected networks like Hausmann's Paris, above left.

Source :Glen Innes Railway Station

Another feature apart from density is, really how the streets themselves are laid out, and how they are connected to one another? If you see a pattern like this, the one on top you have a more or less gridded pattern, and this facilitates along the arteries especially the use of buses and other public transport links, and within these blocks it might be possible to walk to cycle or if you are elderly or disabled to have neighborhood vehicles, transit vehicles or what is known as para-transit to take you to the respective places.

Now, if you have the suburban kind of design, the typical suburban design in the United States where you have a large number of cul-de-sacs and so on, it makes it very difficult for public transport to actually reach those places. So, that is a real challenge in planning, so it is not just density but also the way the network is organized that matters for planning.

DECLINING TRANSIT RIDERSHIP   **BEST BUS SYSTEM CITY -BANGALORE**

Cycle   Car   Two wheeler   IPT   Public Transport
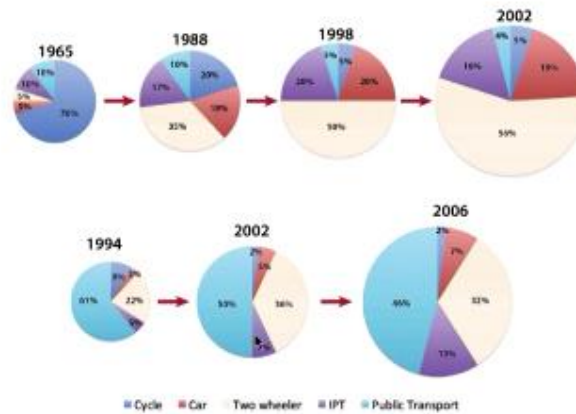
Redrawn from : (CRRI,RITES,CDP-2006)

Now, in many parts of South-Asia, many Indian cities, in particular, you have a declining role for public transport, and this is partly because of growing prosperity on the part of users, but mostly because of poor planning. And so where people who are transit-dependent are forced to spend long times in buses, and usually out of frustration they, the first thing they do is buy a two-wheeler. So, the growth of two-wheelers is quite striking, if you look at the case of Bangalore, and this is the green, the olive green segment, and you see a huge growth in two-wheelers largely because public transport has not been, has not grown in capacity and in the network keeping up, to keep up with the needs of the city.

Automobilised Cities versus Sustainable Transport

Automobilised Cities	Sustainable Transport
• Subsidies for motor fuel, parking, road use	• Subsidies for public transport, cycling, and affordable housing close to public transport
• Focus on capacity expansion of roads; neglect of local street and sidewalk maintenance	• Modernization of roads with real-time traffic management and operations
• Motor vehicle traffic and parking displaces cyclists, pedestrians, public transport, parks	• Road space protected for pedestrians, cyclists, public space

So, I mentioned that auto-mobility or the auto-mobilized cities is a challenge associated with sprawl and we can make a contrast between what auto-mobilized cities look like versus what sustainable transport and sustainable cities might look like. So, in auto-mobilized cities you have subsidies for motor fuel, for parking and road use largely because there is very little often parking fees even when they are imposed, tend not to reflect the true costs of using up that road space or the city space for parking, this tends to be a focus on capacity expansion of roads and a neglect an overall neglect of local street and sidewalk maintenance. So, walking and bicycling are de-emphasized, and cars are overemphasized, and motor vehicle traffic and parking displaces cyclists, pedestrians, public transport, and parks, right.

In sustainable cities, cities that have sustainable transport, there you generally have subsidies for public transport, and subsidies for public transport, especially capital subsidies are very important. Of many successful public transport systems around the world are able to meet their operational costs, but not necessarily the capital cost, and that should be recognized, and that should be promoted because the public transport provides enormous service, and vastly reduces the emissions associated with transport. So, there should also be subsidies for cycling and affordable housing that is close to public transport, and this is what I referred to earlier as transit-oriented development.

Modernization of roads with real-time traffic management and operation, this is also something that is important. And then road space protected for pedestrians cyclists andthe presence of public space, in other words when cities are made pedestrian friendly and cyclist friendly, and there is lots of green space it is more likely that people will be out on the streets. There will be, improve their social life and have greater levels of leisure than if they were struck in traffic, in cars or private vehicles and they have no options for these alternatives.

Automobilised Cities versus Sustainable Transport

Automobilised Cities

- Public transport in developing countries is often overcrowded, poorly maintained, unsafe, and slow
- It is also inadequate in industrialised countries, where urban space has become automobile-friendly but unsuitable for walking
- Unmanaged sprawl and urbanisation
- Weak governance structures for transport and land use policy/planning/management
- Little attention to equality of access among different social and economic groups

Sustainable Transport

- Bus rapid transit or rail in high-demand corridors, with performance-based contracting
- Public-transport-oriented development
- Stronger governance structures for transport and land use policy, planning, and management
- More equitable access for the poor, disabled, young, and old

Now in developing countries, as I mentioned public transport is often overcrowded, poorly maintained, unsafe and slow, it is also inadequate in industrialized countries where urban space has become automobile friendly but unsuitable for walking. Unmanaged sprawl and urbanization also something that you see in both developing and developed countries. And usually, you have weak governance structures for transport and land use planning management particularly in the developing world and very little attention to equality of access among different social and economic groups. As I mentioned earlier, the emphasis has been on pleasing the elites, who demand private roads, who demand less congestion, demand easier access for their automobiles and this all takes place at the expense of the poor and the needy.

Sustainable transport, on the other hand, bus rapid transit and high demand in a rail on high demand corridors would be something that you would see, you would also have performance-based contracting meaning in other words, if you have private operators for these systems they would be paid on the basis of how well they perform, not on how many passengers they carry. So, there are some subtle ways in which you can actually improve the quality of service through contracting rather than you know see those systems decline just because you have poorly managed contract.

Public transport-oriented development or transit-oriented development I already mentioned this and stronger governance structures for transport and land use policy. So, land use policy and transport have to be integrated, they should not be dealt with as having separate governance structures and this is very important because if you think about transport that the need for transport is really the need for access, not the need for mobility and certainly more equitable access for the poor, disabled, young and old.

Thank you