Evolution of Human Settlements
Lecture 15

Metropolitan Solution to Urban Change

If you look at the metropolitan solutions to urban change, over the past 25 years, urbanization has happened at a very rapid space. So, there is emergence of new patterns of interaction. As cities grow, they require institutional frameworks which can manage these impacts, both through anticipating them as well as transforming policies so we can help them in the future. Historically, metropolitan government has been useful to manage new impacts for example: environmental impacts of transportation planning. It is important to emphasize that metropolitan areas of the world are above marked by their differences. So, when you think of metropolitan cities across the globe, it is not just the same everywhere. They are going to have a similar kind of population but apart from that nothing else is similar. The topography is going to be different, the culture, the type of people, the demographics, everything will be different. So, you see differences in access, households, communities, opportunities, quality of life which further deepens these patterns of inequality. So, we will discuss the following types of changes, the typical changes we usually see in a metropolitan area; Fragmentation, Differentiation, Growing inequalities, poverty concentrations, Decentralization, Polarization.

If you look at Fragmentation, what does this actually refer to? The process of Fragmentation of metropolitan areas is clearly driven by economic and social processes but its the first indicator that has always been institutional when communities and their local govt units no longer perceive that their natural links are with the metropolitan core. The process of fragmentation actually begins. This further gets compounded by the growing importance of markets for goods and services beyond the city and sometimes even in other countries. So, what really happens in this is; some cities might not be able to satisfy even the basic needs of it's people. So, the people have to look beyond the boundary of the city. That clearly leaves a fragmentation or the beginning of it in the urban context.

Differentiation - Pockets of wealth and poverty reflect the consolidation of economic and social power and its translation into political power as well. This also differentiates the availability of common services that reflect on the quality of the urban fabric like quality of roads, water availability, power supply, residential location. All of this is a powerful predictor of socioeconomic status and future earning potential. So, it's very clear in all cities, globalized cities or even urban towns and cities, you have certain areas that are more prolific as compared to the others. When you tell someone you live in so and so area, it will reflect automatically in that person's mind, 'ok, this person is well to do, he lives in so and so area or this person is not so well to do because he lives in this area', this perception is there across the globe. Geographical position of one's house not only decides their status but also their future earning potential.

The cost growing equalities. The cost of urban life determines the levels of welfare as well as social mobility. As the percentage of urban poor increase, cities are no longer the solution for a better life for one's children. Rather a low wage future is the only alternative. Simple basic requirements like education, housing etc, are the main divide causing factors. The main reason why people move from a rural set up to the urban setup, is to provide for a better life, when that better life actually does not exist, that city truly fails and at that point of time there is a huge difference between growing rich as well as the growing poor at the same time.

Poverty Concentrations - As the percentage of the urban poor increase, there are 'pockets of poor' sections created within the urban fabric where there is a concentration of slum dwellings, poor quality of roads, water and erratic power supply. As this situation worsens, these slums actually become permanent locations where in some cases they become landmarks such as the Dharavi slum in Mumbai. So, what you actually do not want to happen to a city, is having these pockets of poor. Yes, there are going to be poor people that is not unacceptable but at the same time, having them pushed to one part of the city and not growing that part of the city is what causes the main problem. They should always be a mixed communion of people. There should be the rich, the middle class and the

poor. Similarly, all across the city to ensure that the entire city is dealt with the same fair hand.

Decentralization - This within metropolitan areas is twofold; it refers to the decentralization of governmental institutions out of downtown locations into neighbourhoods or it could also refer to the parallel process of decentralization of economic activity to the periphery of the cities. These processes reflect formation of new urban spatial configurations and interest. This new spatial form is far more complicated and multi nodal than the simple central business district and the sub-urban models of the 1950s. So, when you want to decongest a particular city and you want to avoid traffic, the first thing you need to do is decentralize it. You take Chennai for example, if all the government offices are going to be in Anna Salai/ Mount Road, all the private headquarters are going to be in the same area, there is obviously going to be congestion in the morning and the evening where all the people pour in for work and vice versa. But if you decentralize and create such other nodals across the city, this will not only divert the infrastructural development of the city. But it will also divert traffic and congestion making sure that the city is uniform in terms of development as well as usage. That is very different as compared to the central business district model which was there in the 1950s where the actually wanted a business area, an entertainment area and a residential area. Now, that is not considered the requirement. Now, they want to have many more nodes as possible to make sure there is less traffic and congestion on the roads.

Polarization - These spatial and institutional patterns generate social polarization, between rich and poor between long time residents and recent arrivals and between various communities and ethnic groups. Social behavior is a reflection of perceived material interests. This segregation is manifest in the quality of life i.e schools, transportation, housing etc. So, there is not only a difference between the rich and the poor, but there is also a difference between a person who is from that city vs the person who has come to work in that city. Even they tend to get separated as being residents and non-residents and they have just come in from maybe a short term or otherwise. So, this kind of social behaviour is actually a

reflection of what kind of material interests are there with respect to community as well. For instance; a person native to that particular area will perform or participate in certain community activities that pertain to his community. But a person from another city might not be able to understand this or delve into this right away. So, he forms another section in the city and that is the beginning of the problem in having differences or polarized societies. The Challenge of urban management is fundamentally one of the political leadership. The urban community should have shared interest, there are possibilities for a shared future. Otherwise, these tendencies of polarization, differentiation will grow and become reflected in physical and spatial structures. They require building better public support in constructing a future in which differences once again become strengths and not remain as weaknesses. Our difference should become a strengths. Yes, diversity is good! All of us being the same is not going to take us anywhere, but the diversity has to be put to good use. We need to assert, local social responsibility. We should take pride in our diversity and not make it our weakness.

Now, **Impact of Information and Communication technology on Cities** or what is otherwise known as Smart Cities. If you look at what kind of smart cities have come into being, its because of the growing information technology sector and you can see right over here, this is pretty much the change of our skyline. Tall buildings, communication towers, cell towers, all of them are the new typologies of buildings. You look at it, What drives a smart city? What are the key trends in urbanization? The smart city value proposition, business models of the Smart city concept. Now, you actually look at what exactly is a city; as the size of the city increases, the interaction of the per capital should also increase with better social interaction, it is a better city. Better services with a better or higher social interaction. A smarter city or a smart city has a higher interaction with a lower cost. That is where a smart city comes into being. As we move into the future and our resources are getting depleted, we have to make sure that we learn to use our resources concisely and conservatively. So, now where exactly does this interaction occur? Number one, you have highways and railways which are of high cost. Workplaces, Offices in between. Walking spaces and Bike ways which

are low cost. Now, in terms of interaction, highways are low interaction. Bikeways, railways, workspaces, homes, workplaces, as we get to face to face with respect to not even seeing each other on a highway in large vehicles or in railways, we have to increase our face to face interaction. At the same time, we are reducing the cost which is definitely required.

Smart Cities

If you look at the smart city, it uses digital technology or information technology to enhance the quality and performance of urban services to reduce the cost as well as resource consumption and to engage more effectively and actively with it's citizens. So, this would be a true definition of a smart city. It's not sufficient that, it just has all the comforts. That is any global city or any urban city. A smart city uses technology, reduces consumption and makes sure that the people still lead a very good quality of life. Smart city is an efficient city, smart city keeps innovating and changing by itself. It actually begins with a good connectivity, it turns big data into insight. Smart cities engage better with their citizens, they are agile and inherently more mobile cities. These are the characteristics of a smart city. Why is it that we need smart cities? Our history model has proven that emerging urban layouts have a tremendous impact on smart city development in the future. If you look at the old model over here vs the new ones, this is the historic centre and you had the city growing on four sides. Then you had something called the, "urban sprawl", you have the highways and then all the highways would meet on a ring road and then you would have the urban core. This is where you had the suburbs growing, you have the highways, you have the ring road, you have the urban core and then to support the increasing population, you would have sub-urban cities. So now you need to have, a ring road motorway, living areas keeps growing outside the ring road, as seen in London. There is no stopping to this. If you keep having the current situation, you will just have more and more suburban green dots happening here, but otherwise the congestion as well as the resource consumption is only going to steadily increase. Now, seriously all of our cities are completely reaching their limits. We have reached billion in population. Every second, urbanization is occurring, every second you have at least two people moving in from a village to a city. Eighty percent of our

city are carbon emissions and commercial and residential buildings come consume about 1/3rd of the world's energy. So, when you look at all of this, obviously there is a requirement for a smarter city. When you actually look at the different kind of impacts, what are the challenges while promoting the need for a smarter city, you have monetary and diagnostics, logistics and transportation, sustainability with social reasonability. It is easy to say, let's have a sustainable city but at the same time, all our requirements have to be suitable to a community that has been thriving for hundreds of years. Green supply chain management, Energy crisis, Connectivity and Information sharing, Resource management, all of this will be challenges when we try to promote for a smarter city. When you look at the three dynamics, the three important role players or stakeholders. Number one, public sector and planning, without doubt the government, then you have the systems and then you have the occupants but it is in a chain format. All of them depend on each other, they cannot co-exist just by themselves. So, the public sector and planning are basically decision makers, they have the budgets, they can decide. The systems will inforce decide what kind of quality of life the occupants have, they should be innovative, they should be green, they should be clean, all of that is the systems and what kind of quality of life do we have, how are we going to innovate and make sure that we use the technology and the systems in the right way and how is it that we are going to support the public sector and planning sector. Every city can actually become smarter, we just need to take small steps initially and it doesn't mean a smart city has to be started from scratch. An existing city can also be made smart by using smarter systems, working for the benefit of both the residents and the environment. Human beings till date have always thought that everything is working for them that the environment is at their disposal, they can do whatever they want with the resources. But it is only now as the resources are depleting and as our lives are becoming more and more dependent and intertwined with these resources as man woke up and realized that the environment is not a slave to the human beings but vice versa that human beings are the true slaves to the resources and the environment. The primary benefit of smart cities is to create IT Connected community. Smart buildings, smarter healthcare, definitely smarter citizens to use all of this. Smart transportation, smart mobility, smart energy,

smart education, smart government, smart infrastructure. So, when you make all of our systems smart, our city will automatically become a smart city.

You need to have an intelligent road and properties. Install intelligent traffic lighting systems. The use of biofuels being encouraged with an ethanol-blending program to curb world's oil imports. Road accidents in developing countries have declined even as vehicle sales have rise; while Indian fatalities have soared by 50% in the last decade. The world needs stringent norms to curb vehicular pollution. That should be our first primary goal.

What are the barriers to smart infrastructure? Main barrier is a smart government. We don't have an overarching governmental structure, it exists currently to manage multi-modal, multi-agency changes that are currently proposed and underway. **Data quality and management -** with the increasing need to share information, it is important to come up with standards to assess data quality, and to do this in ways that meet privacy concerns. **Privacy -** There are many different ways in which people give up information in order to get some value back. **Investment -** Greater smartness inevitably involves greater integration, which inevitably means changes to the industry structure. **Vulnerability -** The price of connectedness may be vulnerability to new kinds of attack, so security and resilience needs to be built into systems. **Lifetime -** Electronic sensors embedded into the physical environment can start to limit the lifetime of infrastructure. So the main things pertaining to us, if you look at it as investment. For a growing developing country like India, investment of millions of dollars and crores of rupees is not going to be possible. Another important thing is, how vulnerable are we to these changes and when you look at it, when so much investment is happening, what kind of lifestyle do these cities actually offer us? So, the top five smart city challenges that we face in our country;

Vision : The Smart city vision begins with identifying what issues the city faces and how solutions can be constructed to deal with those issues and how to make the city run efficiently and prosper for decades to come.

So, **Vision vs Real Needs**, if you look here, at the same time we are talking about smart cities, global cities but in all these cities like we have mentioned time and again, we completely forget the poor section of the society, whose basic requirements are not still being fulfilled. It is the 21st century, but still there are homes with no running water, no power and no particular kind of connectivity to roads or anything, they are just huge slums. So, our first program should be, before we even try coming up with a smart city should be a slum free city.

Design : Retrofitting is where design of new smart initiatives must truly shine. Inadequate infrastructure, specifically highways, is one of the areas where design matters most. More lanes, less traffic is not always the answer as it is just more infrastructure that takes an extended period of time to build. Occasionally, causing even more traffic due to construction, it will more likely become a temporary fix for a consistently growing population. While more lanes may aid for the time being, cities must have alternatives like sensors (built into the infrastructure itself or into light posts) and analytics to help redistribute traffic to cut down on citizens' travel times and make more efficient use of their transportation infrastructure. So, when you think of retrofitting a city and that is the main step where decentralization comes in. Everyone should have a five or ten kilometer radius where you don't have to travel more than that for your daily needs or consumptions.

Funding - Locating proper funds for a project can be one of the most, it not the most, difficult component of a smart city initiative. An increasing number of cities around the world are announcing plans to become smart and more resilient in spite of their social, economic and geographical challenges.

Skepticism - Civic engagement is one of the most important portions of the smart city initiative as it is ultimately focused on improving the quality of life for the citizens of the given city. Smart cities bring promise to their citizens as much as they do doubts of their future effects on services, politics, security and privacy. So, yes we all have a kind of doubt when we think of sensors and all these cameras which are placed with traffic lights to see who is breaking the signal and all of that. All that is considered to be an invasion of privacy. But where do we

actually draw the line in this? Is it an issue when location services on smartphones consistently project our location regardless of our knowledge? For instance; we take these cabs where our movement can constantly be traced. That is sometimes good for security purposes but at the same time, it could also lead and make us more vulnerable and expose us to some unwanted elements. It may become a norm for citizens as privacy and security become intertwined with various smart city programs.

Implementation - The actual implementation of the initiative and making it a reality is just as much a hurdle as anything we have discussed. There are many roadblocks in moving this initiative forward, including; Siloed municipal departments, a lack of direction, lack of proper leadership and most of all, lack of tools to make this initiative come into reality. So, to actually successfully implement something, it is not sufficient to have only project planning, we need to have organisational analysis and blueprinting, data collection and cleanup, training and testing and finally, we can go live and do the evaluation of how that city is going to come about.

What are ten steps we can take to build a smart city? Workout what problems need fixing - for instance; take Jakarta and Beijing, they are both currently exploring data dashboards and citywide sensing projects to address issues around traffic congestion, when what these cities really need are vastly improved public transport systems. **Find a leader -** Leaders should come from the public sector, some of the standout smart cities like Barcelona, Amsterdam, Malmo, exhibited dynamic leadership from their mayors as well as chief executives. **Develop a vision everyone can get behind -** The Olympics is a good example of a shared goal which succeeded in bringing together communities, the public and private sectors, academia, volunteers and businesses, everything. When London Olympics were going to happen, the kind of changes that took place was monumental and the time frame was exceedingly fast. **Make a business case -** Networks of sensors need expensive infrastructure, and there's currently little precedent around whether it's the taxpayer or industry that foots the bill. A vision that adds economic, social and environmental value could be key to attracting investment

from tech companies, universities and other sources as well. **Share data and incentivize innovation -** Open data is critical to fostering an ecosystem for innovation, but the public sector with its entrenched ideas around data protection, can be reluctant to share. City councils should see it as "investment rather than an expenditure". **Design from the bottom up -** Fujisawa, Japan, is an example of a city designed from the ground up. Its a disaster proof, self-sufficient town with self-cleaning homes that generate it's own electricity. Even the streets are designed to reduce energy consumption, they follow the shape of a leaf to help natural airflow and reduce the need for an Air conditioning. **Tread Carefully -** We are still in very much, the nascent phase of this, exploring the costs and benefits of these technologies for society as well as businesses, you need to tread with more cautious approach if needed and the complicated issues are on privacy that need a lot addressing and research. **Get politicians on board -** Political leaders are important for communicating the need for new tech, and assuaging citizens' concerns about safety and privacy. It would be great to see politicians explain why are they spending our taxes on a smarter city. **Educate citizens -** A smart city will be irrelevant to most of its inhabitants unless they can learn how to use technology. **Spread the word -** All cities share their experiences and evidence so that they can learn and we don't have to do everything from scratch for everyone new smart city that is going to be developed. When we think of building a smart city in a country like India or any developing country like other countries of Indonesia and all have proved, it is definitely possible. But what are the steps we have to take? We have clearly defined that and even the barriers have been identified. As far as we have the barriers identified as well as the steps leading to a successful model that is being placed, we can learn from examples and come up with building a smart city in our very own country but at the same time, we shouldn't forget our main goal of making sure that all of our cities are slum free cities and ensuring that all of the houses, any urban household has running water, has constant power as well as no issues with connectivity or the housing.