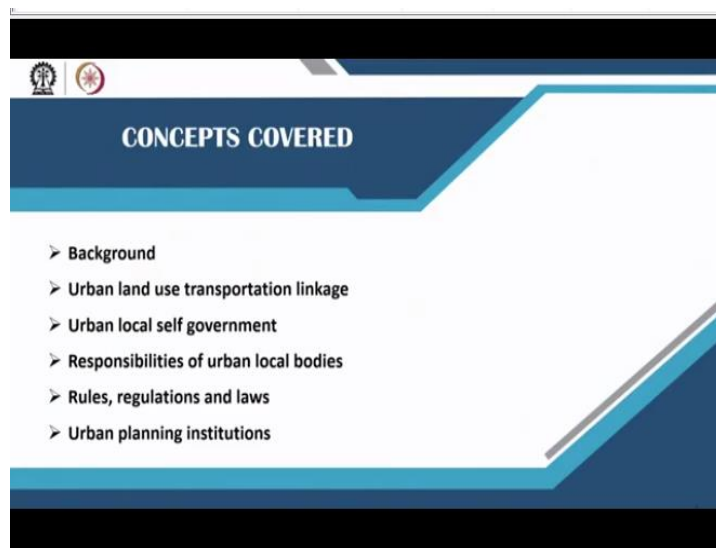


**Urban Landuse and Transportation Planning**  
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**Indian Institute of Technology-Kharagpur**

**Lecture-01**  
**Introduction to Landuse Transportation Planning**

Hello everybody, welcome to the course on urban landuse and transportation planning, we will start with module 1 which is introduction and overview to landuse transportation planning and the first lecture would be on introduction to landuse transportation planning.

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The topics that would be covered in this lecture would be on urban land use transportation linkages, urban local self-government, responsibilities of urban local bodies, rules, regulations and laws and on different urban planning institutions.

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### **Background:**

Urban areas started to develop when lot of people started coming together and settled at a particular area and this happened when they found that when they were coming together and they were living together it actually led to certain advantages. So, the primary advantage that was considered was related to transportation i.e., reduction in transportation cost.

People used to live in villages or rural areas and for them to travel from one village to another, to trade or to get certain things; it would take a lot of time. When they came together at one location it reduced transportation cost to a large extent and then of course when people came together it basically led to growth of large markets in those particular urban areas.

The options and the choices that were available to users also increased quite a bit. This led to a lot of benefits from living in that particular area particularly considering the availability of different kinds of services and because services were shared between a large group, it became more affordable. When so many people came together there was also exchange of knowledge that took place.

Finally, safety in numbers and economies of scale were achieved which means when there are lot of people coming together or a lot of firms or businesses when they come together, it actually generated economies of scale. These were the benefits based on which urban area started growing.

Some disadvantages were also there. For example because it is an urban area and price of land is higher compared to rural areas, the cost of living also increased and then when so many people were living together that also led to a higher crime rate and then higher pollution and of course when there was more pollution it led to more mortality.

Considering transportation, it can be stated that, when we are living in a congested city the travel time for travelling from one zone in the city to another actually increased because the roads were congested. These are some of the disadvantages of living in an urban area, but overall the advantages outweigh the disadvantages and urban areas gradually started growing.

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Technological development also required the division of labor between agriculture and other trades.

Spatial separation between these two also led to goods transport between rural and urban areas.

Urban areas also grew as trade outposts and became origins and destinations of freight.

Once land in an urban area became scarce more lands were acquired along with divisions in its uses facilitating efficient provision of services while following market forces.

While, initially all travel was on foot, the horsecar, then railway and later the automobile gradually reduced the time and cost of travel thus resulting in vast urban expanses and sprawls.

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Thus, in addition to the advantages that were discussed in the last slide, there was another fundamental change. The labour engaged in agriculture earlier now got engaged in lot of multiple trades in an urban area. So, this means division of labor took place and this specialized division of labor because of technological development actually required agriculture and other trades to be segregated.

This also led to growth of cities because this segregation happened between agriculture which is primarily based at rural areas and other trades like commerce, retail etc. which are based at urban areas which required goods that were produced in the agricultural hinterland to be brought to the urban areas.

This led to transportation of goods. Therefore, freight transportation also started and some cities started growing as trade hubs particularly ones beside a river or sea. Some of these centres became ports and so trade started in between cities as well. So, trading was not limited within the city and between the city and the peri-urban area but also between cities as well.

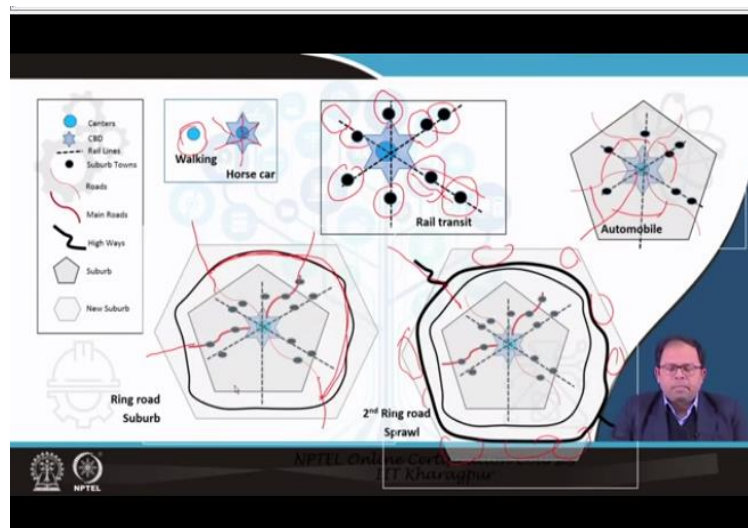
Subsequently highways or trade routes started forming. Hence, the city gradually grew and land became scarce in most of the urban areas and the city needed to grow further. So, the initial settlement which was defined by a group of the settlers who had migrated to that area now started growing and expanding and that actually required acquisition of more land from

the surrounding areas. Therefore, agricultural land started getting transformed into urban areas and then of course division of this particular land for different uses were undertaken.

Based on market forces, certain lands were reserved for residential areas and other lands were reserved for industrial areas and so on. This means that, the amount of land required as well as the price of land and the location of land is guided by the market forces.

Now when we are discussing about the growth of the city obviously transportation started growing as well. Initially when the settlements were smaller, people used to travel on foot and then gradually the horsecar, then railway came. The invention of automobile actually started expanding the cities at a great pace. So, that is when the city started expanding very, very fast and that led to the growth of urban sprawl.

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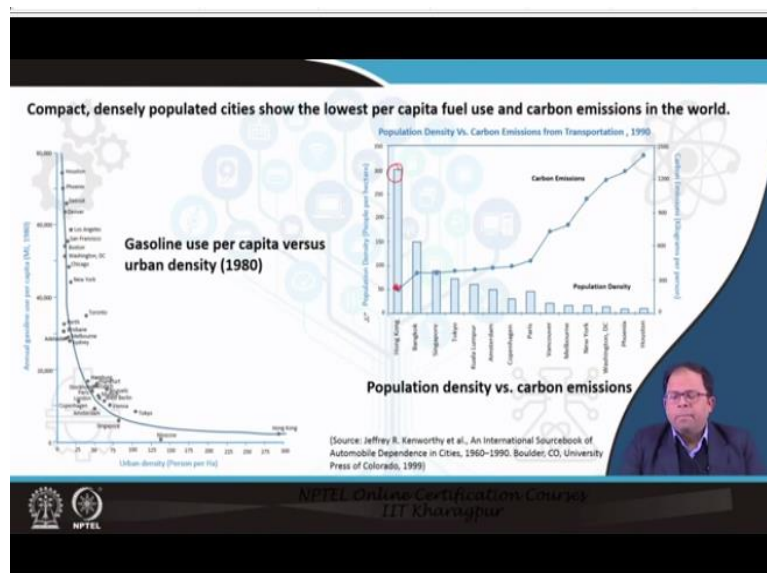
This process is explained in the images. When the cities were small people used to walk. The size of the city was also small because everything was within walking distance. Then came the horsecar and as you can see roads started growing and the city started expanding in the different directions. And next the transit lines came.

Along with the central core city area, the city also started expanding in the direction of the transit corridors and then in the location of the stations, suburb areas were created which also started growing and so on. Then once the city started growing along with rail transit the highway network started coming into place which are marked in red in the image.

Roads in between the highways also started developing and the city started really growing very fast and when the city grew this fast then there was congestion along the roadways and people felt that a ring road is required which will bypass some of these condition and make them travel from one part of the city to another faster.

When the ring road eventually came, the expansion did not stop and the city still kept on growing and you can see this in form of the expanded suburb areas in the figure. So, the city required a second ring road. The final figure shows the highway connected with the second ring road and then the inner ring road became part of the city's normal road network. This is how cities kept growing. This is one of the primary problems that we see in urban development today and has been discussed in many forums.

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When cities are compact, the amount of fuel use and resulting emission is less. So, compact densely built cities have a smaller footprint in terms of both the land area and the amount of gasoline or fuel use and the resulting emissions are also less.

Most of the cities in the Asian region or Asian continent like Hong Kong, or Bangkok having very high population density (more number of people staying in a smaller area) show low fuel usage and emission. We can argue that Bangkok is not that developed or maybe certain other cities are not that developed in Asia thus resulting in lower travel demand and low fuel usage, but Tokyo and Hong Kong are very well developed cities and because of their form or

because of the way they are, i.e., they are more densely packed, the amount of fuel use and emission are both less.

So, compact urban forms, transit-oriented development and other similar city planning initiatives were gradually taken up as sustainable measures.

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The slide features a blue and white color scheme with a background of faint icons including a gear, a tree, and a person. The text is as follows:

**Urban land use transportation linkage**

Land use and transportation systems are inseparably linked.

Land use development, requires spatial interaction which is met by the transportation system of a city.

The transportation system on the other hand determines spatial development on the virtue of improving accessibility.

**Accessibility is an important term in transportation.**

Changes in other factors that also needs to be considered simultaneously .

At the bottom right, there is a small video feed of a man in a suit and glasses. The bottom of the slide contains the NPTEL logo and the text 'NPTEL Online Certification Course IIT Kharsiyar'.

Hence, we can definitely say that land use and transportation systems are linked inseparably. While, urban area started growing by incorporating new lands and getting them divided into different kinds of land-uses, this land use development requires spatial interaction, which means that, there has to be movement in between the different land uses. This is met by the transportation system of the city. While, transportation system grows along with land use growth, certain amount of land-use growth also takes place resulting from growth of transportation systems. For example, when transportation system grows, that doesn't mean it is only the infrastructure part, it is also includes provision of a transportation service like a new bus service is provided in one of the corridors. Now, because the bus service is being provided, many people choose to live around this particular corridor and we see the corridor or the length of the corridor to grow thus resulting in more number of people coming to this particular area. This actually leads to change in the land prices and also leads to a lot of developers coming there and building new houses.

So, transportation system changes certain characteristics of an area and that leads to spatial development as well. Hence, both transportation and land use, even though they are separate system they are also linked. Transportation system actually improves the attractiveness of a

particular area and also improves accessibility of a particular area. Thus, accessibility is a very important term in land use transportation planning.

Along with transportation and land use, there are many other systems or phenomena in an urban area. These systems are also linked with transportation and land use and there may be growth or decline in these systems or some of these phenomena may result in both good and bad effects.

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These systems or phenomena change as well. For example, when an urban area is growing we find that along with land use, there is change in the employment and population distribution. Similarly, when there are new jobs created in an urban area or rather when a new industry is created in an urban area the land use is also changed.

Creation of a new industry attracts employment and when there is new employment, people migrate to the city and they start staying in the city thus resulting in change in the population distribution. This requires additional new jobs to be provided and new places where this new population can be hosted. So, commercial, institution, offices and residential buildings start growing in a particular urban area.

People need to travel using certain transportation modes and certain transportation routes to reach the different destinations. According to the travel behaviour of people, they will decide

on what mode or route to choose or to travel to which particular building or particular destination. Hence, land-use, building use and transportation are all interlinked.

Considering travel time along a network, certain routes take longer time than other routes to reach the same destination. This also means that, if more people use a particular road then the travel time along the road will be slower and people will start shifting to other roads and probably they will also change their mode. So, in this way, there is also feedback coming from the network into the travel behaviour of individuals and eventually into the overall urban land use transportation system.

Another major factor that is linked with transportation is the urban environment. For example if we have too much amount of built-up area it may lead to flooding. Similarly, if there are lot of cars along a particular corridor which will result in lot of emission along that corridor, then people who live along that corridor will probably suffer from diseases related to air pollution. These are some of the different impacts that are possible. So, along with land use and transportation we need to study these impacts as well and the related phenomena and systems.

This will help us to understand the impacts of the different policies that are implemented in an urban area. Along with policies there are also rules, regulations and laws which also guide us on how to plan for urban areas. Thus, whatever plans are made should be within the guidelines and constraints set by these rules, regulations and laws.

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**Urban local self government**

In India land is a state subject and the State Government is responsible for planning and development.  
**74th Constitution Amendment Act (74th CAA), 1st June 1993**  
Formation of local self government in urban areas has now become constitutional obligation.

- 1) Constitution of Municipalities
  - Nagar panchayats
  - Municipal Council
  - Municipal corporation
  - transitional areas
  - small urban areas
  - large urban areas
- 2) Constitution of Ward Committees
- 3) Election in Municipalities every 5 years
- 4) Responsibilities and power to execute items listed in **12th Schedule**
- 5) Municipal Finances and State Finance commission
- 6) Committee for District Planning, Metropolitan Planning

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## **Urban local self-government**

Coming to the different laws, regulations and rules that are in place in India in regards to urban planning, the 74th constitutional amendment is the most important. In India, land use is a state subject which means the state government is responsible for all sorts of planning and development. The 74th constitutional amendment was enacted to give more powers to local municipal bodies or local institutions and the local government. This has enabled them to take their own decisions. With the enactment of this particular act, formation of local self-government in urban areas also became a constitutional obligation.

Local self-governments are the different municipal corporations or municipal councils or Nagar Panchayats which are the different elected bodies enabling them to govern or manage certain areas. Municipal Corporations are for large urban areas, Nagar Panchayats are for the transitional areas and similarly Municipal Council looks into the smaller urban areas.

Within each municipality, there is a requirement to form ward committees which are smaller administrative bodies within a municipal council or a corporation. There are elected members from each ward and this election is held in municipalities every 5 years when people get a chance to choose a new executing body.

This body is also given a lot of power to execute certain things that could be taken up in an urban area. For example, the different responsibilities and powers to execute different work items in urban areas are listed in the 12th schedule. The municipal finance and state finance commission are again two important bodies which actually look into how municipal areas or these urban local bodies would be provided the funds to actually execute the work which should be taken up in those particular urban areas.

In addition to urban local bodies, there is also a requirement for formation of district planning committees and metropolitan planning committees. Metropolitan planning committee is responsible for looking into a larger metropolitan area which includes not one but multiple municipal areas and maybe some Nagar Panchayats as well whereas, district planning committee refers to a regional scale development area or a district where there are not only urban bodies but also rural areas.

These committees are responsible for coordinating the planning activities between an urban area, a metropolitan planning area and a district planning area.

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**Responsibilities of urban local bodies**

**12th Schedule**

- Urban planning including town planning
- Urban poverty alleviation
- Planning for economic and social development
- Promotion of cultural, educational and aesthetic aspects
- Cattle pounds; prevention of cruelty to animals
- Vital statistics including registration of births and deaths
- Safeguarding the interests of weaker sections of society, including the handicapped and mentally retarded

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Responsibilities of the urban local bodies as per the 12th schedule include urban planning including town planning, then urban poverty alleviation and urban planning for economic and social development for that particular area, promotion of cultural education and aesthetic aspects etc.

Municipalities are also responsible for collecting the statistics or the data for this particular area such as births and deaths. Urban local bodies should also safeguard the interest of the weaker sections of society. These are some of the different tasks undertaken by the municipal bodies.

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**Land Use & Building use**

- Regulation of land-use and construction of buildings
- Slum improvement and up-gradation
- Regulation of slaughter houses and tanneries
- Urban forestry, protection of the environment and promotion of ecological aspects
- Provision of urban amenities and facilities such as parks, gardens, playgrounds
- Burials and burial grounds, cremation grounds and electric crematoriums

**Infrastructure & Services**

- Roads and bridges
- Public amenities including street lighting, parking lots, bus stops and public conveniences
- Water supply for domestic, industrial and commercial purposes
- Public health, sanitation and solid waste management
- Fire services

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There are also several tasks which are related with land use and building use. For example, regulation of land use and construction of buildings which encompasses both town planning as well as municipal bylaws and municipal rules, slum improvement programs, regulation of slaughter houses and tanneries so that they could be put in certain areas where they do not harm the environment, provision of urban forestry, protection of the environment and promotion of ecological aspects and provision of urban amenities such as parks, gardens so on. In terms of infrastructure and services, municipal bodies are also responsible for building roads, flyovers, bridges, provision of public amenities like street lighting, parking lots, bus stops and provision of different services like water supply, sanitation and fire services.

The municipal body is responsible for governing the entire urban area starting from the plans that has to be prepared and also to finally executing the plans in form of projects for particular urban areas.

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**Rules, regulations, Laws**

- The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation & Resettlement Act, 2013
- Model Regional and Town Planning Town and Development Law
- Model Municipal Law, 2003
- Policies and acts related to Industrial Development
- Policies and acts related to environment
  - Environment Impact Assessment Notification 2006
  - Environment Protection Act, 1986
  - Eco-Sensitive Zones
  - Forest Conservation Act, 1980
  - Coastal Regulation Zone, 2011
- The Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010

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### **Rules, regulations and laws**

Along with the 74th amendment, there are several other laws which are also important and needs to be taken care of when we plan for an urban area. For example, when we execute one project like a flyover we need to also acquire land which has to be taken from existing land owners of that particular area, for that we have the ‘Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act.’ This act is followed while determining compensation for people from whom the land is being taken. The ‘Model Regional and Town Planning and Development Law’ and the municipal law are the two

guidelines which actually allow planners to prepare plans for an urban area. Similarly, there are policies and acts related to industrial development, environment and for preservation of ancient monuments and archaeological sites. These are the different laws that urban planners should be aware of and plan for different urban areas are prepared following the guidelines and the restrictions given in these particular laws.

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**Institutions**

**Town and Country Planning Department**

- Constitution of planning regions and advise on spatial planning and spatio-economic development(State Perspective Plan, district and metropolitan area development plans)
- Provision of legal support for spatial planning and development
- Preparation of the development plans for urban local bodies (ULB) in special cases and ensuring appropriateness of development plans as per state perspective plan
- Formulation of standards, laws, regulations and rules
- Urban and Regional Information System

**District Planning Committee**

**Metropolitan Planning Committee**

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Thus, along with land use and transportation, there are several other systems and subsystems in an urban area which are linked and when an urban area grows, all these needs to be monitored and we need to prepare their plan following the existing laws so that we can guide their growth or we can take them in a direction which is actually suitable or sustainable.

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**Institutions**

**Urban local bodies (ULB)**

- Plan for sustainable development
- Demographic constraints such as total population, population density and distribution
- Physical constraints such as growth boundaries, geological features
- Existing development of the area
- Socio-economic issues
- Jurisdictional and regulatory issues
- Investment and financial issues
- Technical issues

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### **Urban planning institutions**

The primary institution that actually plays a role in urban planning is of course the town and country planning department. This is a central government institution and they are responsible for helping the different urban local bodies to create spatial and spatio-economic development plans. They also help in preparing the state perspective plan, the district and metropolitan area development plans and so on. They also provide legal support for issues arising out of any new plans and development schemes. For example, whenever a plan is prepared it eventually becomes a mandatory or statutory document which has to be followed by everybody who is living in that urban area. Thus, there are lot of legal issues that crop up which is when support is provided by the town and country planning department. While, urban local bodies hires consultants for preparation of development plans in most cases, sometimes the town and country planning department also takes up preparation of these plans. Formation of different standards, laws, regulations are also the responsibility of the town and country planning department. The department is also responsible for development of an information system comprising of maps and other data which would be helpful for planning for the different parts of the country.

Additionally, the district planning committee and the metropolitan planning committee can also take up planning for their respective districts or metropolitan areas. Urban local bodies need to plan for their own sustainable development, considering the different constraints such as the total population, population density, the distribution of population in that particular area, geographical boundaries, the geological features and the amount of area that is in hand. This will ensure that the population carrying capacity is not exceeded. Other considerations while proposing development of an area should include the historical past of the area, the existing structures and land use, socio-economic issues and other jurisdictional and regulatory issues like environmental regulation that is applicable to this place. For example, in case there is a forest in the planning area, care should be taken that no encroachment or development should not happens in that area. Finally, investment and financial plans should ensure that enough money is available to execute the plans that are being proposed for this particular urban local body.

The urban institutions are also responsible for the different technical issues that also arise while preparing a plan or even executing a plan.

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These are some of the references you can follow. One of the main reference is the ‘Urban and regional development plans formulation and implementation guidelines’, prepared by the Ministry of Housing and Urban Development.

I would like to conclude this particular lecture by saying that, while land use and transportation are independent urban systems, they are linked and they have to be considered together. Urban land use planning and provision of transportation infrastructure, facilities and services are both responsibility of local bodies which means local bodies should prepare land use transportation plans. Finally, urban land use and transportation planning is also guided by several rules, regulations and laws which both act as constraints as well as guidelines for developing our future urban areas.

Thank you.