INDIAN INSTITUTE OF TECHNOLOGY ROORKEE

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Housing Policy & Planning

Lecture – 19
Housing infrastructure and service (Transport and Roads)_

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Hello, in the last lecture we discussed few parameter and dimensions, which under the develop and control which is recurred to specify the build ability of plat or area best on the land is plant. So, today we will discuss the requirement of housing infrastructure and services I will focus on transposition and roads seems, this is discussion will be continuing for the 2-3 lectures.

So today will given over view, how it works in city and will focus on a transportation part. So before go to the lecture of the quick recap. So the last day what I mention in the discussion that we started from the land use planted. So out cab land uses basically, we discuss the land use and density and in the land use where are gross, net and city level land use. So after the land use and density frame, then we make several developing controls in terms of FSI, GA, height and urban design element okay.

So many things we do as a develop and control. So also we discuss that the FSI is the build ability of the plot and the factor will deferments FSI is basically infrastructures, which qualifies your land are agriculture land as a buildable land or developed land for housing developed. So, to go for the further strategy element of the housing developing city.

Let us discuss the infrastructure element of the planning. Now also we discuss last date that FSI, GA, Height and urban design elements are related. We saw that in over view we discussion show that this elements are required or required to define the outer envelope of building. So that it

looks good. So that becomes durable, it becomes long duration, it becomes homogeneous and hormones to overall contest.

That is objective of the discussion and another point also we discussed that FSI and land density this two basically the relation directly professional but we maintain the FSI with a variable density by creating different type of housing units for different economic groups. For example higher income group, lower income group are economical weaker section.

So to determine the FSI maximum, FSI are maximum density. The infrastructure is a very important input because more the composite infrastructure more the number of people living in the same area more the requirement of the infrastructure. So it is very important understand the types of infrastructure and services how the plain in a given area. So we discuss about the cross land news net land news, I through that let me show you one difficult example how we represent bus gross and net values.

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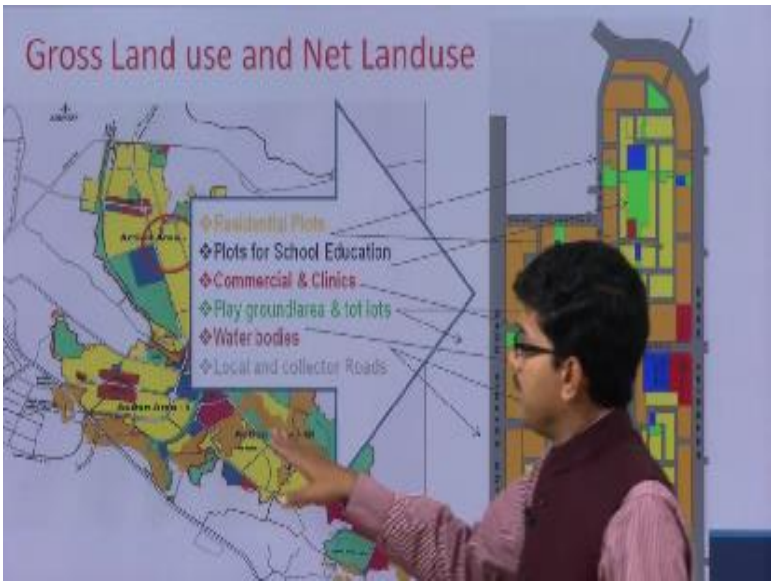

This is a land use plan here you can see that this particular charts show an is yellow area, as a gross land use. When blue of the area after the land subdivision which is discussed in the last 2-3 lecture back. That after the land subdivision the internal layouts, internal roads collect the local

roads, the green areas everything. So this particular year weak an show the each and every plot as a net land use.

So the services different how we represent in the neat on the gross land use. So objective of the housing infrastructure is to create the basic infrastructure, so that we can provide facilities and amenities and weak an deliver accountable service.

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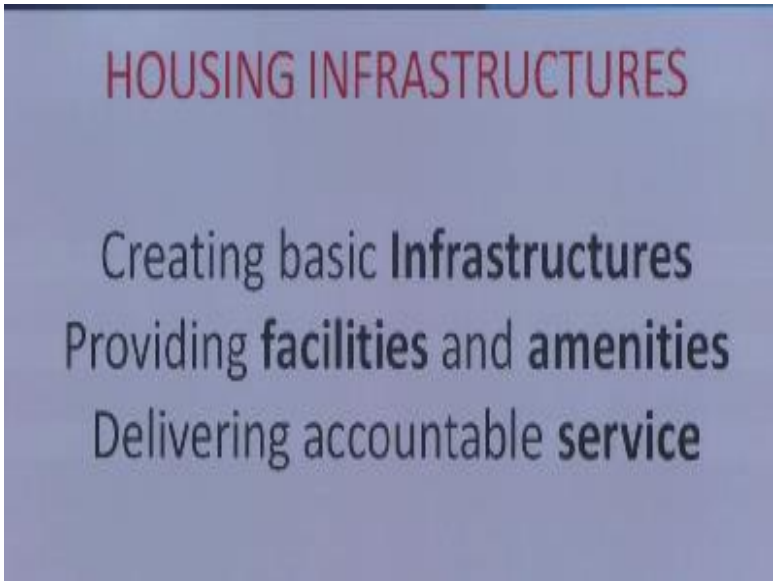

So what are the meaning of the terms? Now letters see very discussed various dimensions of any housing we show that it is multiple house, multiple units that should be community and there should be essential services including livelihood and we should be affordability, individuality attention should be there.

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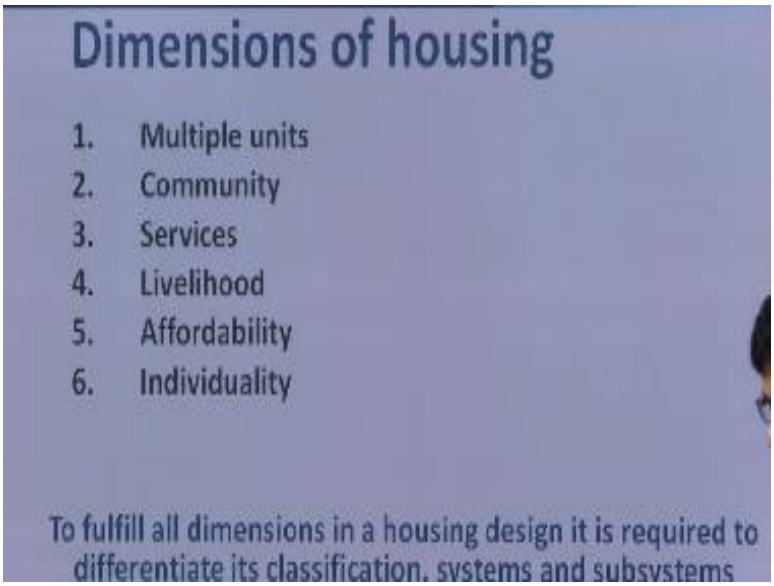

So services very important part for any housing development. So we are not going to much details, though we discuss this so what is a infrastructure, so why infrastructure very important in overall planning and development, so what is the expectation from the planning infrastructure planning and what are the key competitions required for a planners to deal with infrastructure and who are the other contributors in infrastructure planning?

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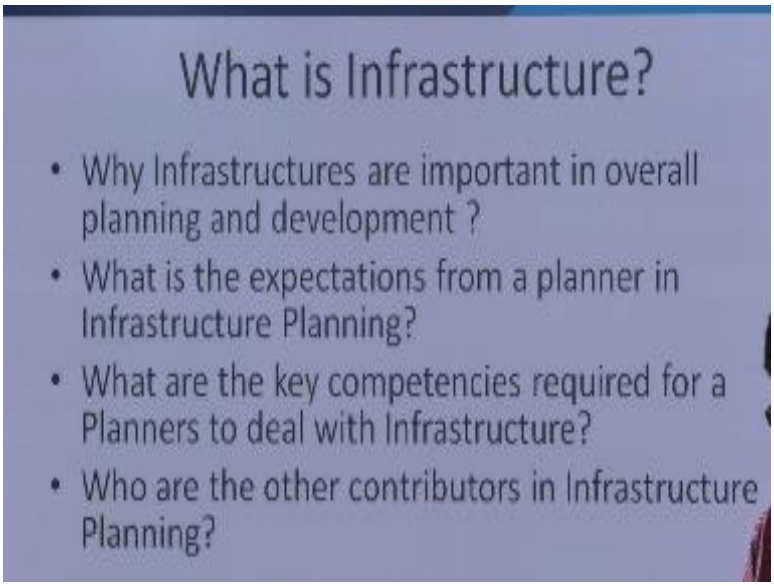

So infrastructure though itself is a separate very important subject were engineers, planners and architectural works in the field. But has a housing planners as policy planner also he should have some basic element of knowledge for the infrastructure planning as well.

So infrastructure basically is required to provide some basic services, which a need for day to day living, like perform daily basic human psychological neat cooking food, disposing garbage, taking drinking water having sanitation this services like that and two other basic element perform likely living activity, shopping, health facility to have the safety security, CCT system, Security systems this land use barrier free design.

This are some features to reach to ensure security, to have a space for social need playing, fiends, parks, community space/rooms. So this an also to have basically comports and easiness for self and family home deliver, doctor on call, intercom facility, generator backup.

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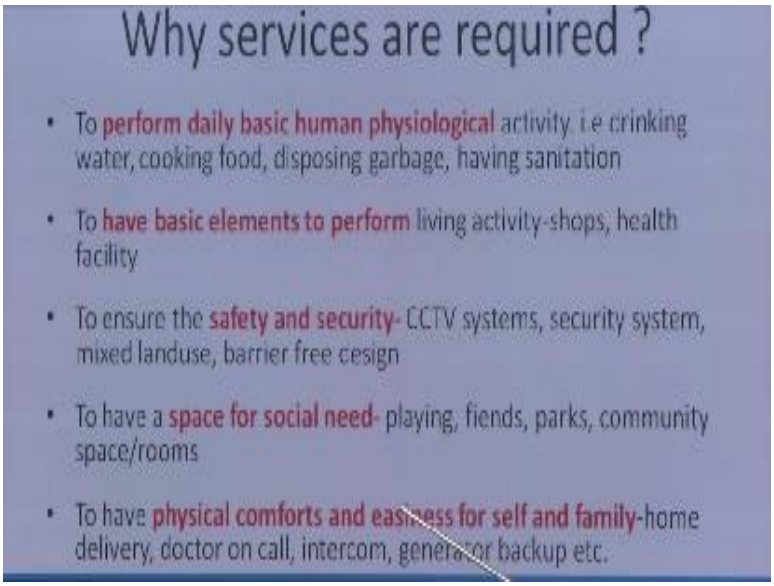

So this are the services which are required delivering but services were a from the services will come. So services basically comes, when same basically investments in infrastructure is a there. For example for drinking water unless, until you have a rubbers system of water treatment plan, the collection facility, the distribution facility and the recovery facility. You do not have a water system unless you have the garbage collection, distribution and disposal facility cannot have the prepped garbage facility.

So this are the outcome are the final protect or final benefit what you get from the infrastructure provided at the town supplier all the city. So now letter discussed the basic terms, so infrastructure is the physical element of any services like road and access treatment plans, genetic system extra which is physically you can see you can touch, you can feel and which delivers same amenity and services like this.

So services are basically which you can enjoy day to day by like water supply, electric supply, garbage disposal, cleaning off, and drains. All the services which is coming from the infrastructure. Then facilities apart from the infrastructure and services there are facility like the play ground, parks, security systems, water boating, community hall extra.

So the facility are also required to improve your quality of life to improve your quality of living and there are same amenity which is by and large limited to inside your apartment inside your living unit.

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There can be various types of emergency including hot and cold water supply, generator wakeup, home delivery doctor on calls; so many amenity could be provided by a housing project. So we provide the infrastructure and facility at various levels of development starting from the city to the local or the unity level. For example this is a land use level at the city level, we provide the facilities.

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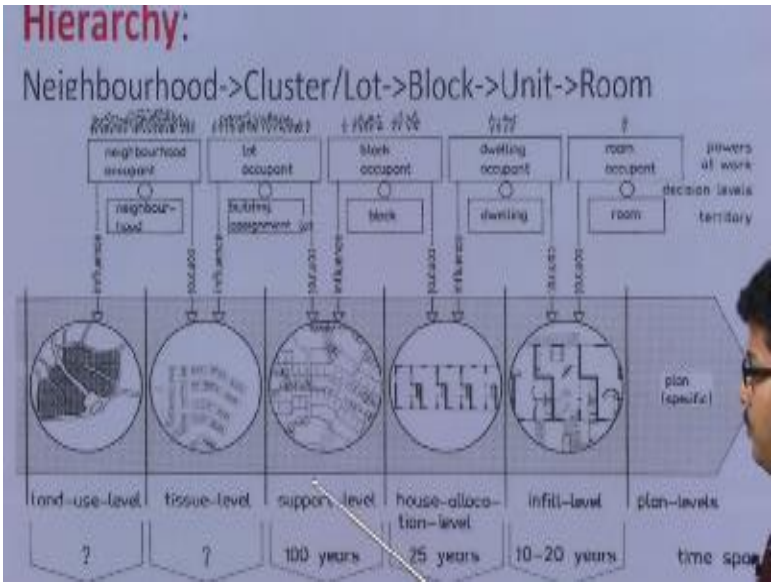

Then at the building are the block level we can provide same facilities. So here the number of the population will be more, so it can be distributed over few blocks likes this. So here the population will be less and then the dulling unit level and the individual room level. So try to understand at the city level, the first structure at the room level or the building level infrastructures are different.

Let us taken example, at the city level large stadium, large play ground, large library can be good facility, whereas at the building the security block or the water supply system or any other room level 24*7 water supply hot and cold water and the room heating and cooling facility could be good facility at the room level. So based on the hierarchy and the level of development from the city to the unit level of the room level and the size of this facilities differ and we plan accordingly.

So divide the infrastructure into two major parts one is physical infrastructure, which we told that the physical infrastructure manifests primarily physical where you can see, touch basically roads and transport, water supply, sewerage, drainage, electricity, solid waste management, telephone, gas supply extra and social infrastructure some, we also call it s the facilities.

The facilities infrastructure or facilities like education like school college facilities, health facilities, recreational facility, post and telegraph, police station, fire station, petrol pump, burning ghat/ burial ground, play ground extra.

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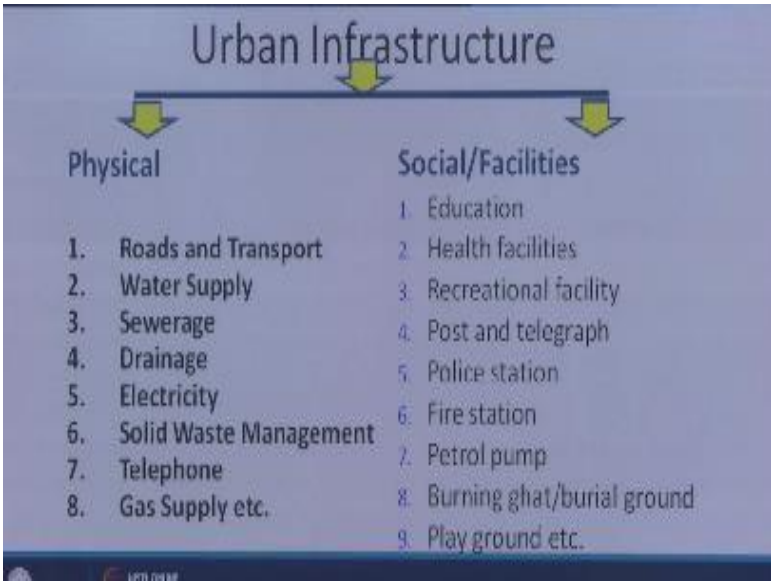

Now please try to understand that, the physical infrastructure does not mean that it is 100 percent physical. Every element has some of the social components physically. Similarly the social infrastructure also have some amount of physical components. For example, to establish a school you need a physical place, you need a physical building, physical land. Though effect and outcome is social. It improves the social quality of the community. That is why it is considered as a social infrastructure or the facilities.

Now coming to having said that we will discuss little more details about the roads. This transportation system become bigger for any transportation system of any city. The network is basically a circulation network is very important to develop that area as a housing or a integrated town ship.

Now there are various kinds of transportation system. It can be transportation system by air city to city or country to country. There can be transportation system through water from one point to

another point, and you can go through the inland water system or there can be surface system using road and public transportation system. So under the road we have different kind of road: National roads, regional / state roads, and also we have the urban roads like arterial road, sub arterial road, collector roads and local roads and other than this things we can have rural road, which is very narrow road.

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And may be the quality of this specification of roads will be different. Our main objective or focus will be to discuss the dynamics of the major urban roads and the other smaller level urban roads and how does it relate with the overall housing development?

So there are few elements which we should understand the carriage way, median, divider, footpath, cycle tracks, service roads and intersection because after this few lecture on the planning. In the end path we have the few lecture on the planning of the individual projects, there we should deal some of the elements of this road section.

So these are the pattern of the roads, these can be linear, it can be greater on, it can be radical and ring, it can be radial.

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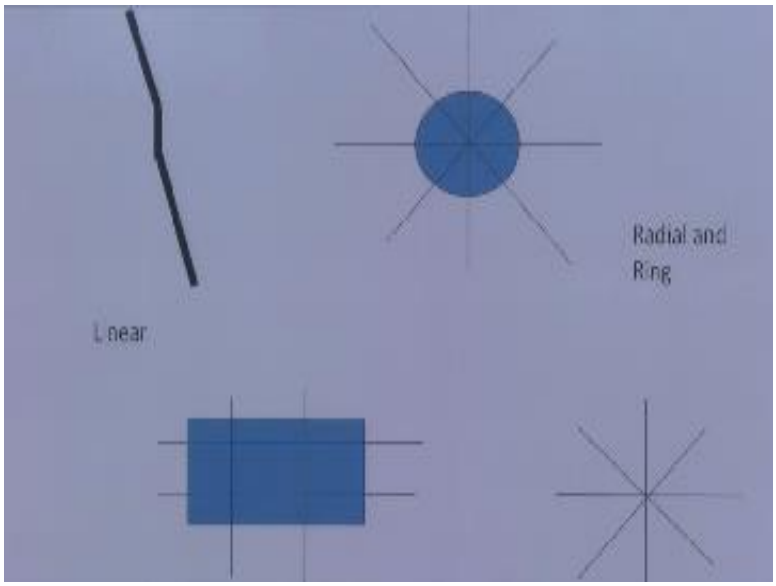

So before I go to a comparative statement let me tell you how the different kind of roads looks like and how we how all the elements are placed to design the road. So major roads what we discussed is basically arterial and sub arterial. The meaning of the arterial is the it is coming from the artery which is the objective of the artery in our body is the to is to circuit the blood from one part to another part.

Similarly in a city the arterial road and the sub arterial road they transport or they tells people to move from zone to another zone. So it objective is not to help you to axis to your house. It objective is to take you from one zone to another zone of the city. So let us see how a arterial road looks like,

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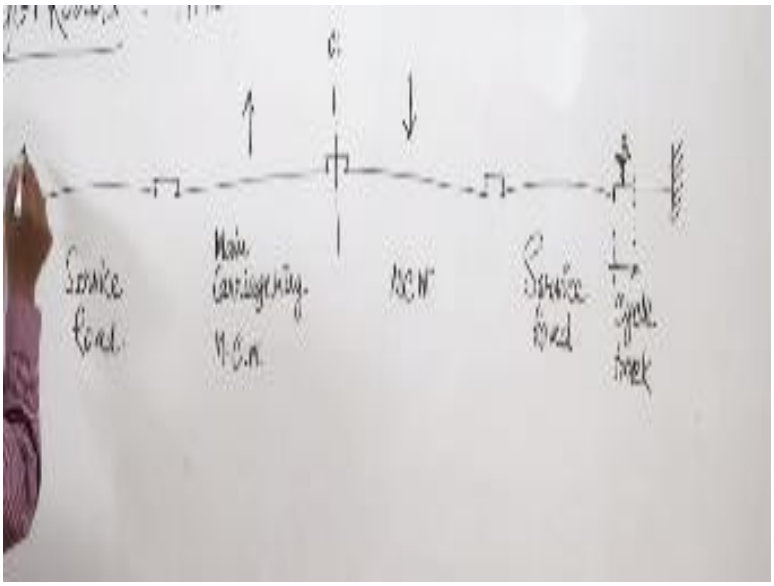

So you can see that this area is kept for cycle track, this is footpath and this is also footpath and this is the median. So this is central line and the median of the whole road section and this is the main carriage where the high speed vehicles like public transportation bus is an all those will go. Basically we keep 11 to 14 meter minimum 14 meter, so that at least 3 to 4 car can go side by side.

This is 3 lane to 4 lane and here we keep minimum 7.5 meter, so that at least 2 car can come fast side by side like this and remaining on the space availability we provide but definitely for the cycle track 1.5 meter to 2.5 meter is the space required. So this is the typical section of a arterial road.

So total width of the arterial road are righter way in short ROW is 60 to 80 meter. So 60 to 80 meter right of way. Out of this is the median and this is called divider. It basically divides the main carriage and the service road divider and based on the requirement and the space availability this divider and the median could be used as providing the trees for landscaping and for public convenience.

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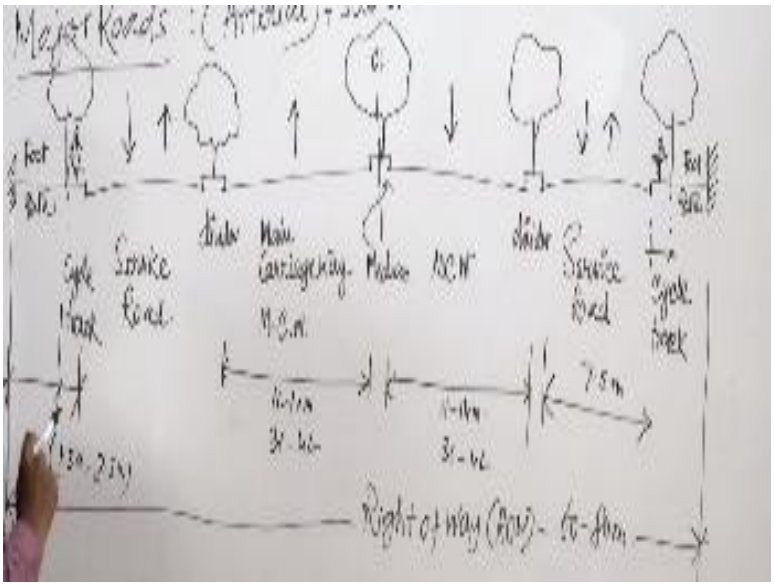

So this is a typical section of a arterial road. So arterial road is a major road giving the access from 1 sector to another sector. I will show some example definitely 60 to 80 meter wide, but if it is a sub arterial road. Then for sub arterial road it will be so it is to 60 to 80 meter for sun arterial road it will be 40 to 60 meter.

The objective of sun arterial road will be more or less similar, but only thing in this sub arterial road connects the collector road with the arterial road. So the collector road and the local roads at the next level of the lower level of road which collects the tricks from the of the vehicles from the local area and they after collecting the local vehicle they put in the sun arterial road and sun arterial road is connected to the arterial road.

So I will show some picture will understand. So were as the arterial road is 60 to 80 meter and sun arterial road is 40 to 60 meter. It could have the service and sometimes it may not have the service road sometimes. Sometimes e provide the service road or the several service lanes using the movable divider. So we are not going to much details of the transportation planning or transportation design because our objective is to give the over view of the each sector of the infrastructure and services so that you understand in the better way.

So that the next part of the planning when you go for the housing planning, we can understand in a better way. Next let us see how it looks like the other route or the minor road and the urban areas or the residential areas. So collector road and the local road, so let us draw it so for the collector road for a main carriage way will be minimum 11 meter ,where as your right of way will be minimum 18 meter, but it can go after 24 18 meter to even 24 or even 30 meter.

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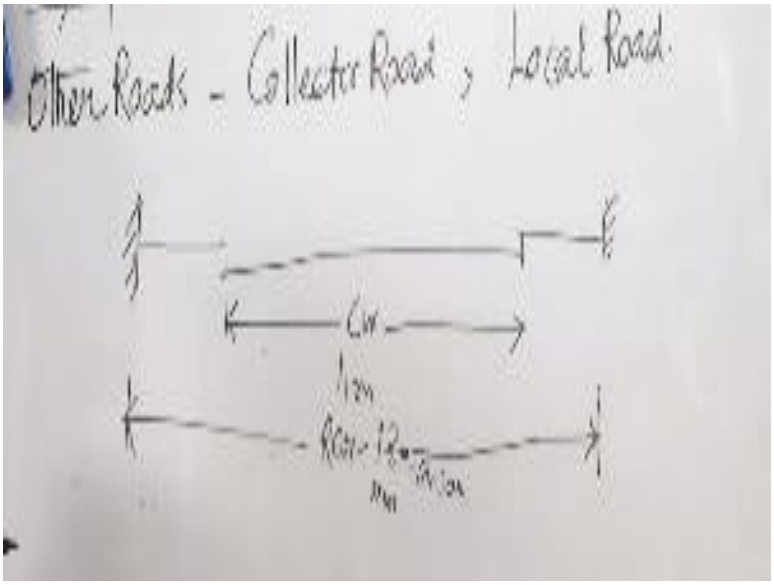

So its main objective will be to collect the local traffic, local vehicle and to connect with the sub arterial or in some cases arterial road. And the local road is basically, so for the local road it is 7 meters of the 2 car can pass side by side with the minimum right half will be 10 meter. Whereas the collector road the minimum right half will be 18 meter to it can go up to 30 meter.

So if this is the arterial road of the CT then sub arterial road could be than like this and collector road will be the second level of connection and the local road will be even very small road like this right so this may be typical example.

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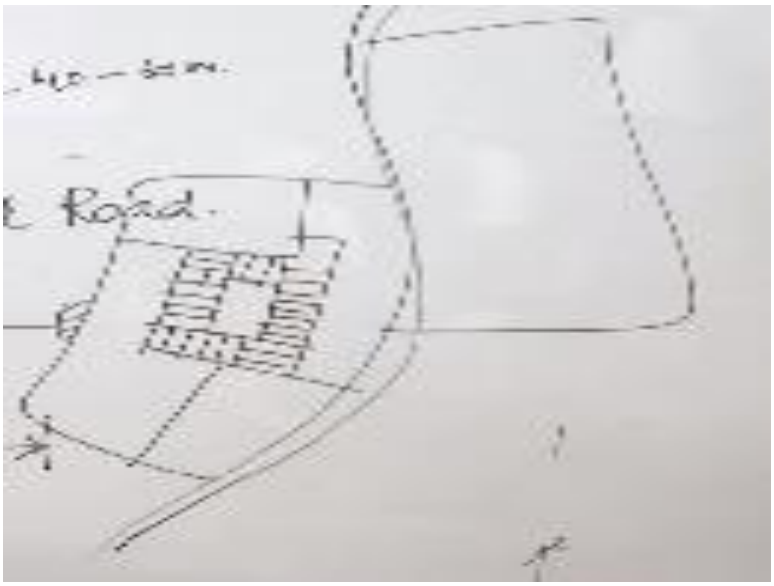

So you can see that that arterial road should have the junction not very frequent very far away junction, but local road they could have junction very near junction because speed of the vehicle in the local roads are less very low than the arterial road.

So let us see a comparative chart to understand in a better way the average width of arterial road is 60 average with 60 to 70 to 80. Sub arterial road 35+ -10 collector road 20 local 10. Its main purpose is to connect the city with the zones same the collector roads objective is to collect the local traffic and connect to the sub arterial road. Its objective is to give you axis to the plot basically to serve as a local traffic.

The interval between the junction for the arterial road will be more like 1 km for sun arterial not less than 400 meter, where as the local road have by junction of about 50 meters it can be having frequent junctions and interfere road slow traffic the arterial road can interface can meet you the slow traffic on through the service road where as the collector road and the local road yes definitely meet with the slow traffic because that is the objective of the arterial collector road and the local road.

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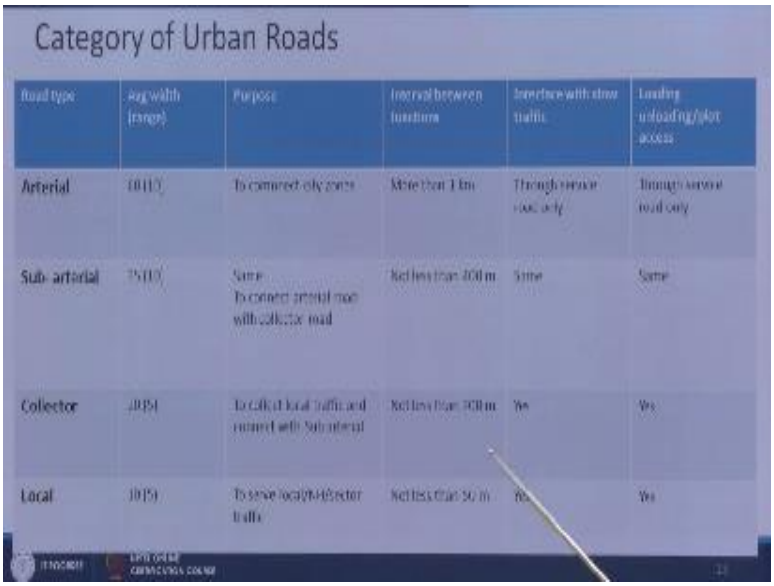

The loading unloading are the plot axis whether you can perform loading unloading stop of purpose is like coming down from the us and getting boarding on a bus. Those kind of thing are done only through the service road for arterial and sun arterial road, whereas collector and local road can provide this loading unloading and the dropping of facility.

So this pictures I am showing again you can see the major roads arterial road and sub arterial road and these are the another side of arterial road where as these are the sub arterial road the local roads and collector roads are not shown in the master land dues plan that I have told earlier also. It is shown in the sub division plan or the plot lay out plan.

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We shall mention that to like this. So in the local road in the sub divided area or the plot lay out plan the local roads and the plots and the green areas and the community facilities are shown in a greater details. So do discuss to specify this we have how we as some of the nonsense tenders we mention in as in terms of dimension and its specification, but for any infrastructure planning or any services we have the different kinds of nonsense tenders.

We mention some of the nonsense tenders the most important nonsense tenders standards is planning work is the URDPA5. The full form of the URBPA5 is Urban Regional Development Plan Formulation and implementation guidelines. It is formulated by the government of India ministry of urban development. So it gives you the planning norms and the planning methodology and the process for every level regional planning city planning and the local level of the planning.

The national building code, the national building code of India gives the oral frame mark of designing of a building, any type of building and it services.

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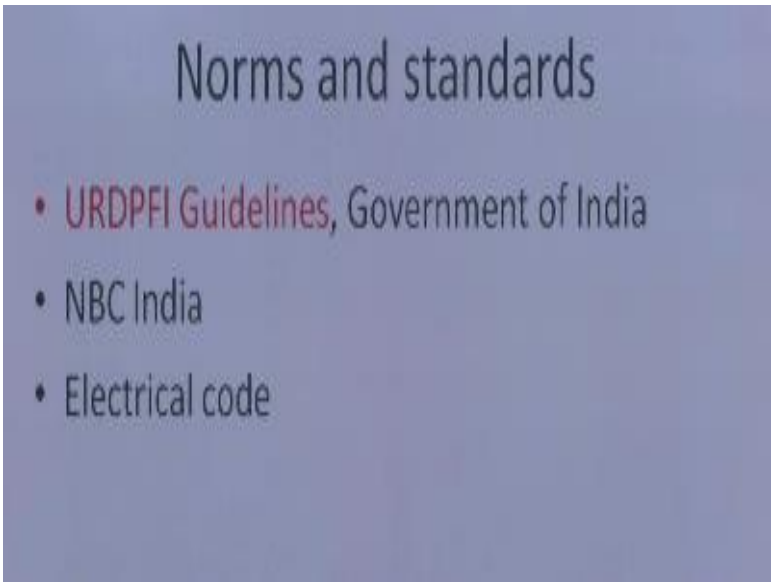

The electrical code in India they provide the basis and the frame work for designing the electrical installation and electrical services in a city. The central public health and engineering and environmental organization manual they provides the norms and standards related to the sewerage sanitation, water supply and public health matters.

So all the sewerage sanitation and the public health matters we definitely follow this CP8W manual. So including these there are apart from these URPPFI, NBC, electrical code and CPHEEO manual we have local rules and regulation like every municipal authority or Municipal Corporation.

They can prepare their own rules and regulation which will be followed as per the requirement like for any city we make the master plan and then we make their housing development. So developing that particular housing project, we have to follow all the codes and also the local rules and regulation for designing the housing project.

So next lecture will just touch up the overview of the few other infrastructure like drainage, sanitation and electricity and electricity and sanitation management, just to make you aware that

how does it work for using mechanism in a city level, at the township level so that we understand. And then after that you also touch up on the elements of social infrastructure and the facilities.

So today we discussed the essence of infrastructure in a city, we told that infrastructure is divided into part the physical infrastructure and the social infrastructure. Social infra structures are sometimes called as community facilities and the services are the tangible benefit which we get from the infrastructure. The water treatment plan could be a infrastructure which needs a capital investment but the water drinking water we get from it is the service in tangible element.

Similarly for some immunities and the services are required at the housing level at the project level. Some immunities are basically determined are considered at the one side or inside the building or inside the room facility and infrastructure services and the facilities and immunities all these are planned as per the level. Some services are declared at your room some services are required at your plaster level that means the block level or building level and some services are required at your neighborhood or model level.

Some services will be required the city level regard services. That is the cracks of the discussion and based on the requirement or the provision of the service, we can determine the build ability of the city and we can go to the projective project design of the housing project. So thank you for today next day will discuss the other elements of the infrastructure development. Thank you.

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