Infrastructure Planning and Management
Introduction to Infrastructure and the Transportation sector
Part 1C

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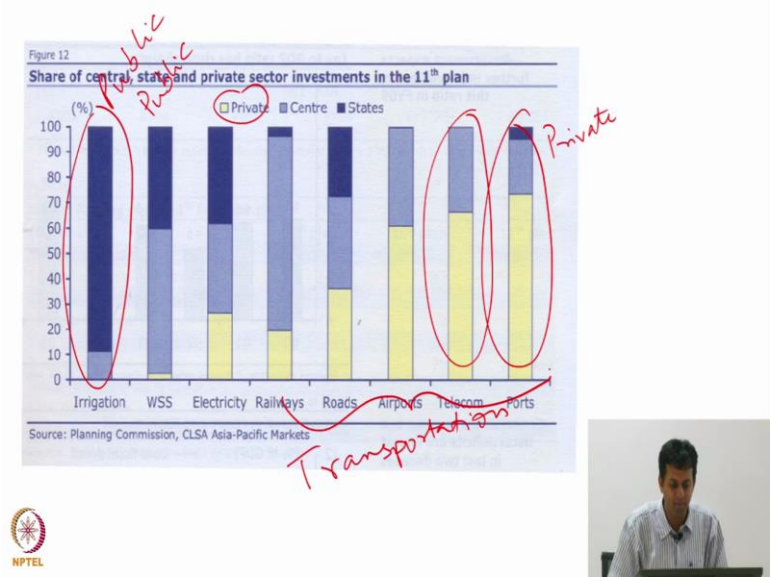

So, now let us start getting into sectors. So let us start and this is just sort of a graph, it is a bit dated. I think it is probably about five or six years old, but it shows the share of private versus public investment in various sectors. So the yellow is the private as you can see and the blues are public investment, but public investment again can be central government or state government. So you look at sectors like irrigation, it is almost completely public, so most of it is government supplied infrastructure, water supply and sanitation also almost completely public. At the time electricity was quite public and now it is becoming a bit more private, but then when you come to some of these place of infrastructure like ports it is highly privatised, many of the ports are privatised.

Telecom of course you do have BSNL and we will talk about that later, but you know, we all know there is Jio, there is Airtel, there is you know whoever, a lot of it is privatised. Roads, there is quite a bit privatisation, so you can see that in transportation, which probably all of these fall under transportation, you have quite a bit of privatisation. Whereas on some of the other sectors there is less privatisation water and sanitation, etc. We will get to those, and there is reasons why there is less privatisation, but there is a little bit of spectrum, at one point, all of this was blue, light or dark.

Now we are starting to see more yellow coming in, it is not as if yellow is good thing either. There are issues with privatisation. So we will have to look into it, but as we can see we are expanding infrastructure, so do we need more transportation infrastructure?

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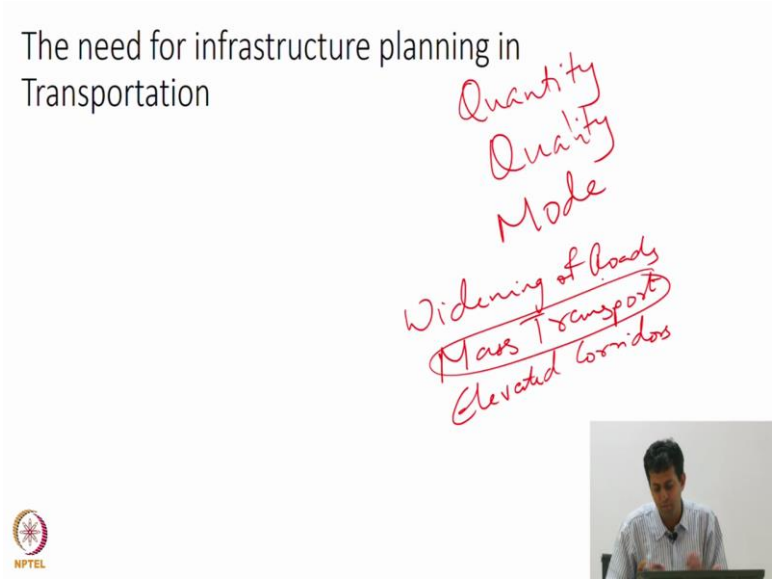

So the point is, there is a quantity that we have got to look at, there is also quality of the infrastructure that we will have to look at and in transportation, particularly there is something that we will like to call up on, called the mode of transportation that we should look at. So your point is that you know it does not necessarily have to be these large expressway kinds of systems, perhaps we can invest more in public transport, so there is a choice that we have to make, but by enlarge, the question is if we all agree, if there is a need for transportation infrastructure, where is that need ? What do you think we need to do?

Okay, so one is, we try to eliminate congestion.

Professor: How do you eliminate congestion?

Student: Widening of roads.

Professor: Widening of roads, fine.

Student: Mass transport.

Professor: Widening of roads and well Mass transport, elevated corridors alright, all of these are solutions.

Student: There needs to be a push towards transit orient….

Professor: The push towards transit oriented development is the all mass transport kind of agenda right, but essentially the point is, if you take traffic congestion, there are a number of things that you can do about it. Some of these things are possible, some of these things are desirable. So, for instance, widening of roads in an urban setting that may not even be possible. For instance, if you just look at the road outside IIT Madras, Sardar Patel road, we have already got to a point where there are no sidewalks. If anyones even tried to walk from our out gate to Cancer hospital or Guindy park or whatever, you are at in any given moment you are at risk of being moved down by some motorist.

So now if you say widen the road there is no other option except to start encroaching on space from IIT on oneside and you know whatever is on the other. So some of it may or may not be possible. Widening of roads in a highway context, it may be possible to go from a two lane highway to a four lane highway because there is land by the side of the road in some cases, in some cases there isn't, in some cases you can't.

Mass transport again, somebody said transit oriented. We will get to transit oriented development in a bit, but mass transport against saying look, one of the ways of easing traffic congestion is to take people out of individual vehicles and put them into buses and so there are these lovely pictures we might get a guest speaker who will show these pictures, showing a very congested street or very congested road with cars, etc. and then the same road with three buses and essentially saying all of those people that you see in that picture could be accommodated into three buses in the road is a vast, expansion of emptiness.

So, mass transport is highly desirable, but requires first of all, a lot of behavioural cultural change, people need to sort of accept mass transport and of course need that infrastructure to be developed. I have no problem in taking mass transport, but I would like the buses to have a certain frequency that they stick to it, in which case it probably is better for me, but if I don't do that infrastructure improvement, mass transport doesn't work.

Elevated corridors again, they do solve part of the problem, but they are also very expensive and so there is a little bit of a trade-off between how much money do you want to spend. So there is, as you can see any of this aspects of infrastructure, even something is simple as removing congestion and if we brainstorm more, I am sure will get more ideas. There are lots of debates surrounding it and it becomes very difficult to say what should I do, which of the three should I do, which works best etc.

So, but what are we doing about it right, so again, specifically or let's go back to the question of what are some of the challenges and what are we should be doing about it and by the way transportation does not mean roads alone, essentially transportation is a bunch of things, transportation often is roads, urban as well as expressway, rurals, etc. air, ports, as well as waterways that are often use to transport goods, so, rivers and all of that come under transportation.

So dedicated freight corridor, why do we need a dedicated freight corridor? What purpose does it is serve? So there is again a lot of thinking on freight corridors, essentially roads where goods travel rather than people right, so we have, so you know roads essentially move both people and goods, but goods are more expensive and contribute in greater numbers to the economy right, and so can we not have better sort of freight corridors. So again there are schemes in government, for instance, we do have a dedicated DFCCIL I think is called dedicated freight.

Student: Corridor.

Professor: Ya, corridor, so there are schemes where we are trying to build freight corridors, so, again I think the the point is, so we talked about transportation it is divided into number of categories.

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If you start looking at some of the numbers right, you will find that, there's lots of these increases everywhere, so for instance rail and road freight traffic which relates to exactly your point on the dedicated freight corridor, are going to grow at 12 and 8 percent per annum.

So to achieve about a 50:50 in total, or half of freight traffic will go on rail, half of rate traffic will go on road, but these are going to continue to increase. So if you are saying we have a problem now, that problems only going to get worse, because the traffic is going to increase. Similarly, passenger traffic is expected to grow at 15 percent per annum , more people are going to be mobile, more people are going to have access to vehicles, but more people are also going to need to travel more because of lifestyle etc.

So the point is, what we are saying today is, if you are saying there's congestion on the roads today, it's only a problem that is going to get worse if you don't intervene. It is not anywhere close to a steady state, so as result of which we really need to obviously gear up in terms of building better infrastructure.

You know rail passenger traffic again expected to grow 9 percent per annum, so it is not just road, so we have to sort of look at how did we augment railways. So obviously that is because there is a shortage, now on the other hand, you go to place like Western Europe. You just walk to the station and you buy a ticket right, and trains are relatively in some cases thery are quite empty. They sometimes have the opposite problem I feel, where they are running too many trains without probably making enough revenue of the trains. But the point is that transportation infrastructure and everything, air traffic,

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everything sort of going up the roof, again passenger through port at Indian airports in 2011-12 which is five, six years ago now, was 162 million and this number is just going up. The total cargo handled by the ports was 914 million tonnes with a cumulative annual growth rate

right, of about 9 percent. So we are handling large amounts of cargo and that number is just going to keep going up and more people are moving into cities. There is a lot of rural to urban migration, so your congestion problem is only going to get worse. So existing infrastructure is inadequate and the problem is that the needs are growing. It is not sort of static target that we need to achieve. As and when we achieve these targets, those numbers are going to be higher, so essentially we have to aim to be somewhere beyond, where we need to be today.

So lot of infrastructure needed, lots of schemes on going, so we talked about a few. What are some of the transportation related schemes that you recall, so somebody said NHDP, National Highways Development Programmes, so that is an elaborate programme to develop all kinds of national highways and so, generally you have classifications of roads in India. You have national highways, you have state highways, you have major district roads etc. etc. So national highways essentially are interstate for the most part connecting large cities etc. and that is something that is a big programme of expansion that we are going on, both for passenger and for freight traffic. We have been doing it for several years, there is a quite a bit that has been done, it is actually now quite nice to travel in various parts of India because you can actually drive through.

So Chennai to Bangalore for instances use to be a nightmare, is now a breeze, in fact probably driving is the best way to get a Bangalore today, rather than flying or you know taking the train or whatever it is. So the National Highways Development Programme has worked on developing highways, so that is one scheme it is still in progress. We have not finished developing all our highways yet but that is one flagship scheme, part of which is the golden quadrilateral, the Bharat Mala. So the golden quadrilateral was essentially North, South, East, West right, so you wanted to sort of connect all four, you know sides as well as the diagonals if you will, so you had the North, South and East, West corridors and so on. So that was one of the first phases of national highway development programme and then of course there are whole series of roads that have been built.

So NHDP is one flagship scheme, particularly in the road sector, what other schemes? You already talked about the Pradhan Mantri Graham Sadak Yojna, that something is happening more at a rural level.

Professor: other than roads.

Students: Interlinking of rivers

Professor: So tthere is inter linking of river project, which is sort of in various stages of debate. There is also an Inland Waterways Authority, and we are trying to sort of see many of our waterways can become navigable. Primarily for again, goods transport etc. can be done through sea, so certainly there are some sort of incentives and schemes in the waterway transportation sector. What else have you heard of in transportation?

Students: Udaan scheme.

Professor: Udaan scheme for airports, so have been talking a lot about airports as well. Again we have these major airports, then we have these minor airports. Now we have this Udaan scheme that incentivises, you know development of both air, incentivises airlines, incentivises airport providers. So in the air aviation sector we are looking quite a bit at,improving the quality of our airports in many parts of the country right. What?

Student: (audio not captured adequately, too low in volume)

Professor: So from an urban transport perspective we are betting quite, in quite a big way on metro rails systems and again I will not touch on metro rail today because, when we talk about urban infrastructure I think it makes more sense to discuss it there. But I think by 2030, there are about 50 cities in India that are supposed to have some form of metro rail or the other, in terms of, some might actually have connected networks, others might have metro rail projects in various states of construction but about 50 Indian cities are probably going to have, as per the plan metro rails by 2030. So that is again, sort of, are thinking in terms of how do we bring in mass transport.

So our bet today is on metro rails as the provider of mass transport, of course there is huge debate, some people say look metro rail is extremely expensive and carries fewer people than a good bus transit system. And people will point to Bogota and Columbia, which has an extremely well-functioning bus rapid transportation system and so on and saying, you know if you have dedicated bus corridors etc. you can actually have and building bus rapid transits system is far cheaper, you just need to buy buses. You don't have to build the roads for the buses, whereas for the metros you have to build the entire infrastructure, whether it is above ground, whether it is underground, you got to build stations, wire ducts all of those kinds of thing.

So this is a bit of debate but we have chosen to go the metro route right, in many cities, so that's something else. So there are number of these kinds of schemes, dedicated freight

corridors we've talked about, in rail we have had the National Rail Vikas Yojana, we have talked about the NHDP, PMGSY.

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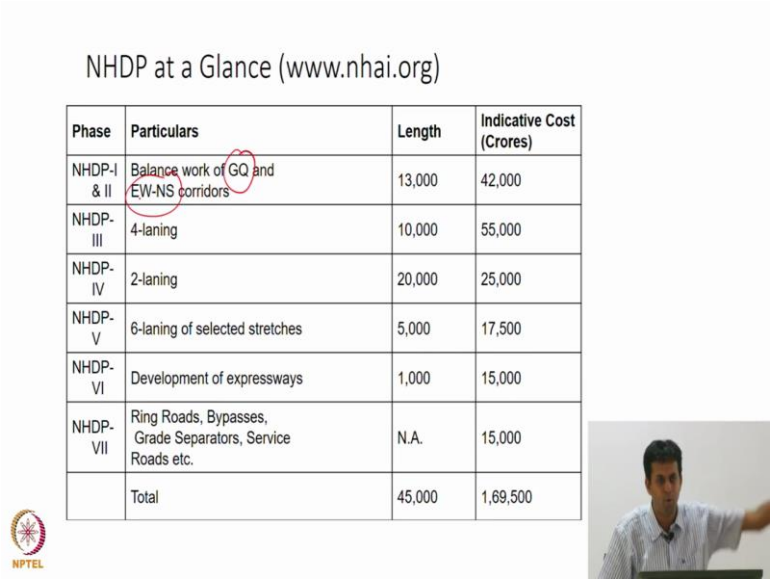

So mentioned few of these. This is a snap shot of NHDP, it was split into several phases. The first couple of phases focused on the golden quadrilateral and the East, West, North, South corridors. Then we started looking at four laning, six laning, development of expressways which are like the freeways in the US. So currently on our highways anyone can get on and get off anywhere right, so you can pull over etc. But if you have been to US and you went on a freeway, there are certain exits and therefore your speeds are much faster etc. So there is notion of building expressways and so there is a huge sort of phased programme of roads that we were planning to build etc.

The northeast for a variety of infrastructure, you know sectors is of great interest because there, if at all relative to India, that area is least developed and so there are some extra incentives to actually develop in the northeast. There is something sort of quite interesting called the Central Road Fund right and what the central road fund does, it says that, there is this tax that you pay on diesel and petrol, which goes into this fund.

And monies from that fund are then used for developing infrastructure, particularly rural roads right, where it becomes difficult to finance those roads. You can have a toll road, you know in connecting two major urban centres because lots of people will go back and forth, they'll pay toll right, but in rural areas is very difficult, and so you have, you know these central road funds, so the point I want to convey is we need a lot of infrastructure.

But we have done some of our homework as a country, we have some data, we aren't sitting back. We have a number of schemes and this is only a partial list and in some ways a dated list. I hav not updated this before I came into this class but then number of other schemes that we are talking about, these schemes have massive allocations, so it's not like we are doing nothing. In fact we are doing quite a bit in infrastructure, all of this. Okay, airports, privatisation etc. and I won't necessarily and there are all kinds of incentives etc.