Traffic Components and Characteristics
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Lecture No. 05
Traffic Signs, Delineators and Signals

Welcome to Module A lecture 05. In this lecture, we shall discuss about traffic signs, delineators and traffic signals.

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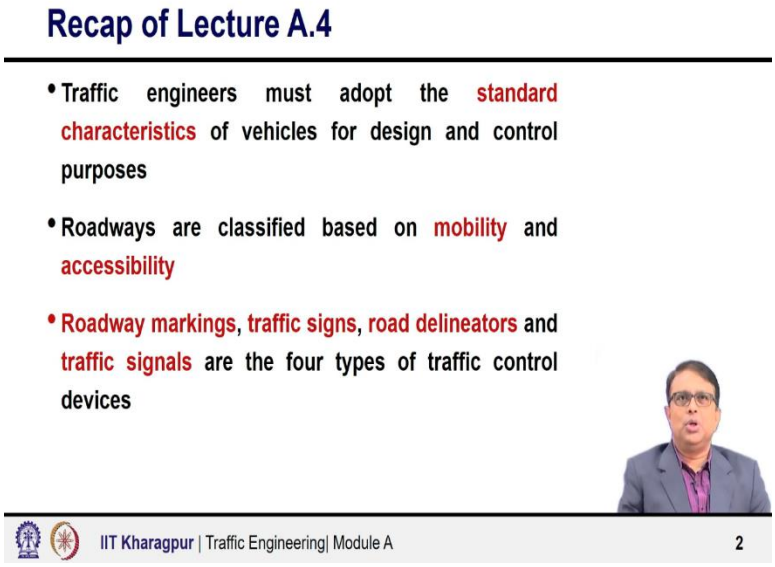

The four major components of traffic systems are road users, vehicles, roadways and traffic control devices. In lecture 4, we discussed about vehicles, also talked about the roadways, highlighted the mobility and accessibility functions and then we introduced you to traffic control devices, said that roadway markings, traffic signs, road delineators and traffic signals are the four major types of traffic control devices which are used.

And we discussed in details about the road markings. Today we shall talk about traffic signs, road delineators and traffic signals.

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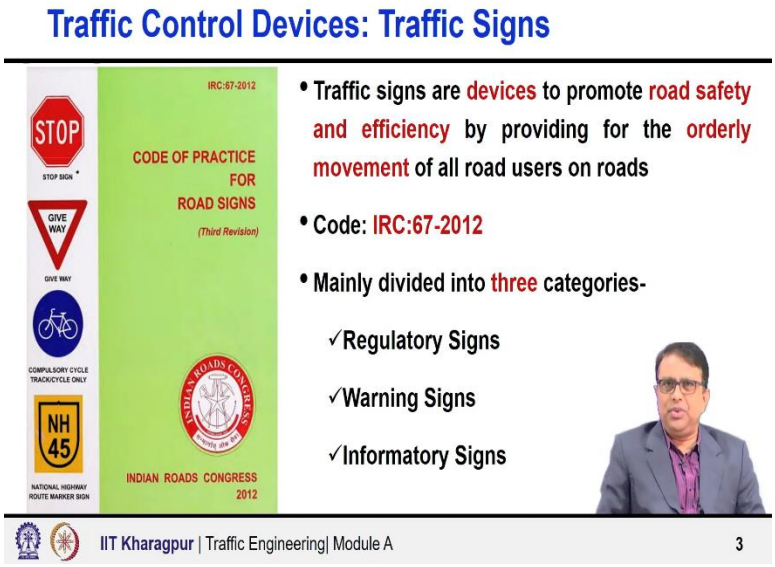

To start with let us first take traffic signs. Traffic signs are devices to promote road safety and efficiency by providing for the orderly movement of all road users on roads. So, these are the devices which promote road safety and efficiency for the orderly movement of all road users on roads.

In India, we have a code, Indian Roads Congress Guidelines, rather guidelines, not the code, IRC guidelines IRC: 67-2012 and all the details are given there. It is a very well developed code, A to Z anything related to road signs is available there and you may refer to this code if you wish to know the things or if you want to really install signals and want to know everything in details.

Here, we shall cover some basic points most important points and shall try to give you an overview of traffic signs. There are three types of traffic signs or three categories of traffic signs which are normally used regulatory signs, warning signs, informatory signs primarily depending on what purpose the signs serve.

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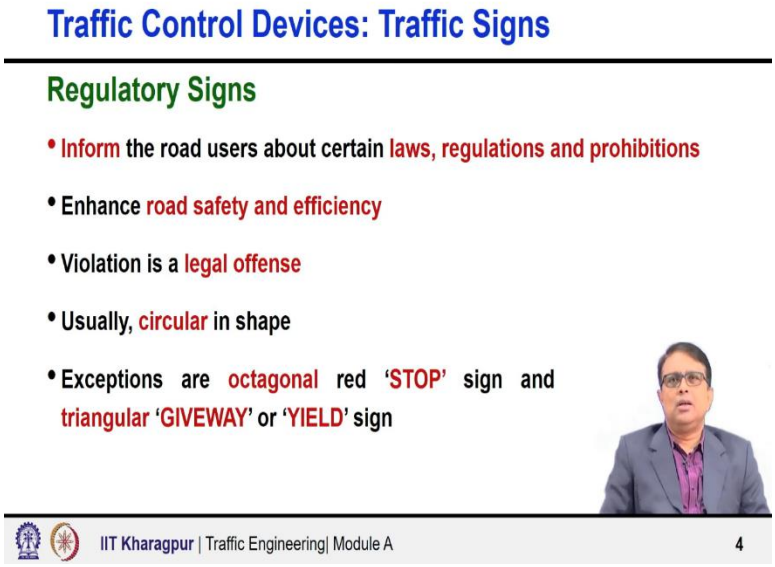

Regulatory signs inform road users about certain laws, regulations and provisions. Traffic engineer are the traffic part of traffic management decide many things for example, deciding the speed limit, deciding the restriction of movement maybe for motorized vehicle for other kinds of vehicle, restriction in width, restriction in height of the vehicle which can use a road, the regulatory aspects of the traffic engineering or traffic management or traffic operations whatever you say.

So, regulatory science help to communicate to road users about certain laws, regulations and prohibitions. Altogether, regulatory science enhance road safety and efficiency and violation of these signs is a legal offence that means you may be prosecuted if there is a no entry for vehicles and if you still enter in that direction you may be prosecuted as per law. So, these are violation of this is illegal offense This is very important.

Usually all of them are circular in shape. So, just by looking at the same, if you find any sign circular in shape you can understand it is going to be a regulatory sign. That means you must actually respect that sign but they are of course two exceptions. One is the stop sign the other is the give way or yield sign. Stop sign is actually octagonal red stop sign and triangular give way or yield sign. What is the meaning of stop sign?

If there is a stop sign somewhere mostly when a minor road is meeting a major road at the junction from the minor road approach you will find often a stop sign that means, it is mandatory for you if you are approaching from the minor road and if you see the stop sign, it is mandatory for you to stop. You have to stop then look for a suitable gap on the major road

traffic stream and then whenever there is a suitable gap and safe gap you consider, then you have to actually complete the maneuver.

On the other hand, the give way sign indicates the priority that means exactly in the similar situation instead of a stop sign if there is a give way sign that means, you have to slow down but stopping is not mandatory. You may eventually have to stop if you do not find a suitable gap then you have to stop and then when as and when you get a suitable gap, you may proceed but even without stopping, you can slow down and if there is a suitable gap without complete stop, you can still proceed.

But stop sign if it is there, you have to stop then look for a gap and then you can proceed. So, you can understand clearly the stop sign is more stringent. So, wherever we find still safety issues even after installation of give way sign, we install a stop sign.

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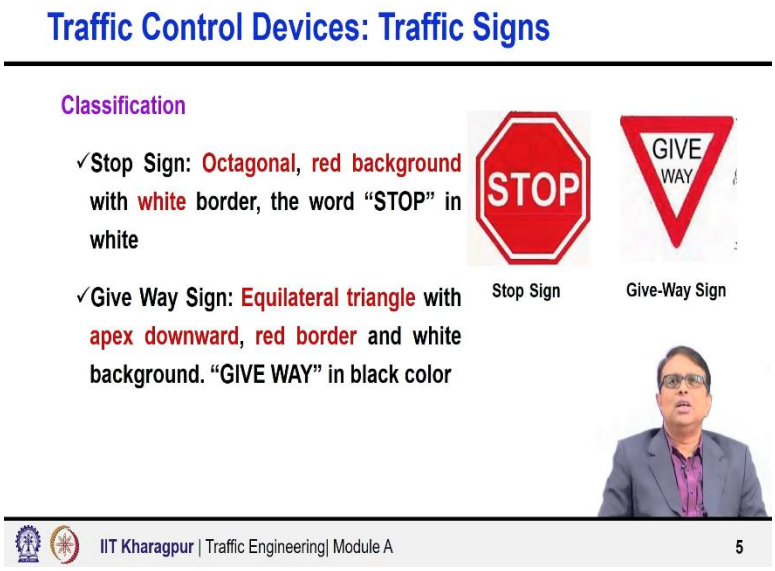

I have shown it here how the stop sign looks like how the giveaway sign looks like. Stop sign is octagonal red background white border and the word stop is written in white. So, they are all remember about the traffic sign, the code is so developed everything is standardized. Let us not try to reinvent it, let us not try to deviate anything let us not try to apply our mind because the uniformity and consistency of traffic sign is very important.

Remember a person with a driving license can drive travel or drive in any parts of the country. So, unless the signs are really standardized science or uniform consistent, it will create enormous confusion among the drivers. So, let us not try to be innovative. Organizations implementation who are primarily responsible for implementation and

operation must install sign only as per the IRC guideline following this code and every detailed information is available.

Give way sign is equilateral triangle with apex downward. This apex downwards is very important because when we go to next to cautionary sign, you will see that they are also triangular but the apex instead of apex downward it is apex upward. So, this is very important that it should be apex downward. Understand that the shape itself has to be proper.

You cannot write a rectangular take a rectangular board and write the word stop because it is not acceptable because rectangular board is for informative design. You will see it later. So, every sign has to be as per the specification and as given in the Indian Roads Congress Guideline. So, give way sign is equilateral triangle with apex downward, red border, white background and the word give way written in black colour exactly as I have shown.

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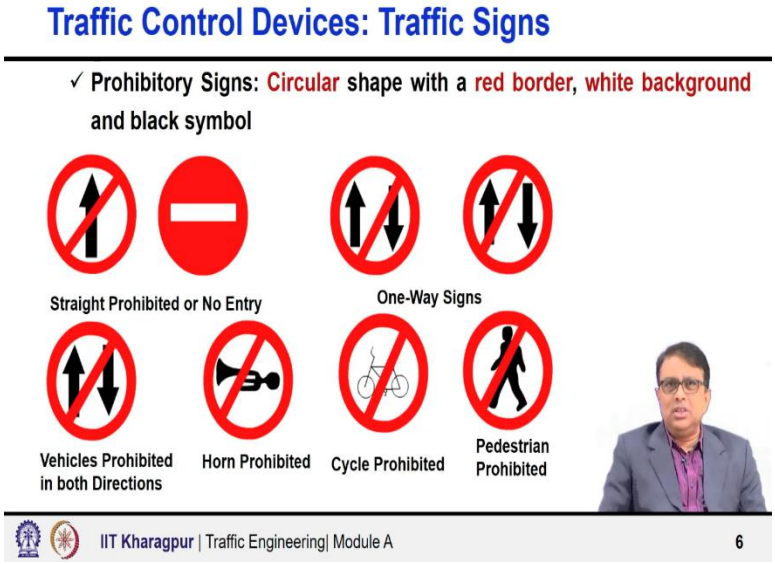

Next, there are within this regulatory signs there are many categories as I said, one is stop sign the next is give way sign; two are unique. Then number of a number of prohibitory signs. All these prohibitory signs are circular shape with the red border, white background and black symbol and if there is a prohibition, it is not allowed, that is actually a cross line, a diagonal line is passing through that.

For example, if you see the first one, it shows straight prohibited. So, the circular red border white background, black symbol arrow and then there is a cross line that means in that direction, movement is not allowed. So, if you are approaching in your vehicle and if you see a sign there somewhere that means, you know that you cannot go straight.

Similarly, I am showing one way sign, the way the movement is not allowed, the cross is there on that, so that you can understand clearly. When both ways the directions are prohibited the cross is given in such a manner that it is actually passing through both the arrows. Horn prohibited pedestrians prohibited bicycle prohibited all these are part of traffic management to enhance the safety and the efficiency of traffic operations.

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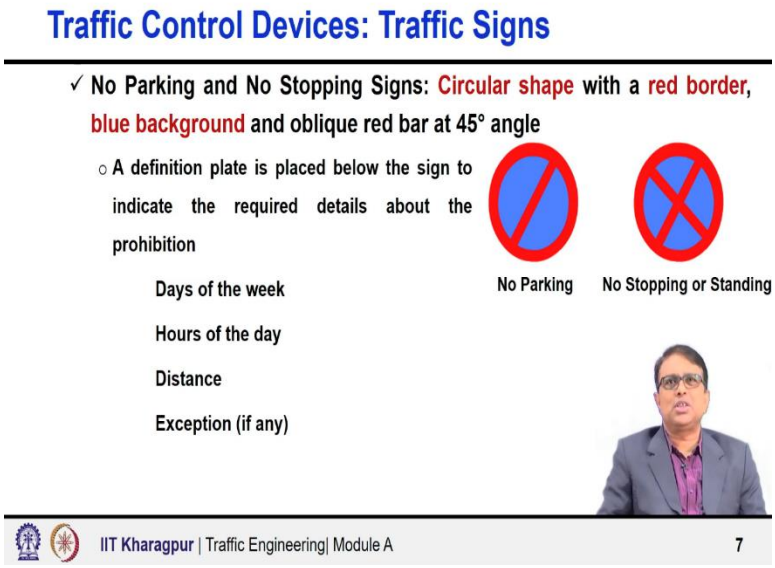

Then, two other signs are remember that there are many other prohibitory signs, I am not showing here all the signs, please refer to the code I have mentioned clearly that this is IRC 67-2012 or any updated version later if it is available, you can actually you should refer to that code and get all the details.

A few things I have mentioned here. So, I have mentioned here maybe a few prohibitory signs but there are more signs like that for different purposes. Then no parking no stopping sign, you can see clearly they are again circular shape with red border, blue background and oblique bar at 45 degree angle. There is a difference between no parking and no stopping signs.

No parking means parking is not allowed but momentarily you can stop just maybe you are the co-passenger want to get down or you want to just pick up your friend and then want to proceed. So, momentarily you can stop, not for a long time, you cannot park there, but you can for a very short time you can stop just for pickup or drop off.

But if there is no stopping or standing that means you cannot even stop there forget about parking. So, more stringent is the no stopping or standing sign. Sometimes these restrictions

are applicable only for certain days of the week, maybe workweek, weekdays typically or work hours. So, sometimes there is a definition board below that it says that yes, this restriction is there but it is there on certain days of the week or hours and how much distance from this sign either on left side or right side or both sides, if there are certain exceptions.

So, often you will find a description board because people must know yes it is prohibited but how long? For how long distance? For how long time? Whether every day or only in the weekend when there are recreational trips a lot of recreational trips and parking demand is there depending on the land use are typically only during the weekdays because this location is in the office area or the CBD area. So, all these things would be there.

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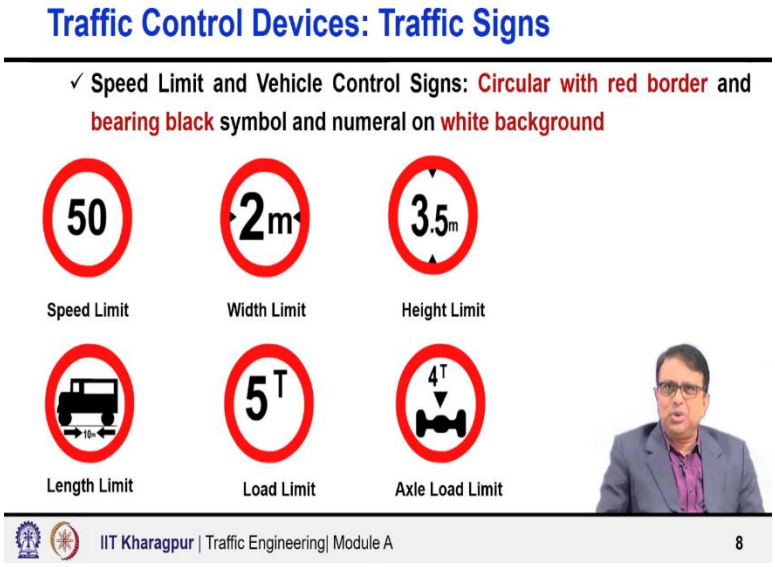

Then next category is speed limit and vehicle control signs. These are again circular, again with red border and bearing black symbol and numerals on white background. As I have shown here, again there are so many signs available so many signs are there under this category but I have shown a few things which are very, very common and very important.

Say for first one is the speed limit. So, if there is 50 written like this, you know that the speed limit is 50 kilometres per hour and you should never ever violate that speed limit. So, next one is like width limit that vehicles which are wider than this are not allowed to use this stretch.

Similarly, if there is any height restriction, it is said that this much height maximum 3.5 meter height is allowed not beyond that. So, there are so many other signs which are related to

speed limit and vehicle controls, those are also given in the IRC code. Here I have mentioned a few.

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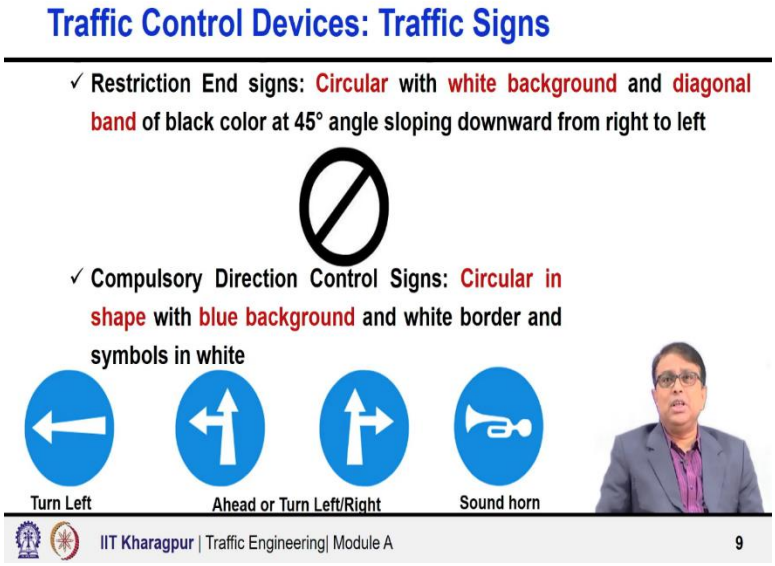

Another very important, but not so well known, I said generally people don't majority of the people may not know this sign, but this is very important. You know so far the restriction is there maybe the speed limit is restricted, but how far how long. So, maybe you are driving on a road the speed limit was 80 kilometres per hour and then maybe because there is a school or a market or an area where there are a lot of vulnerable road users pedestrians are there bicyclists is there. So, you limit the speed to 30 kilometre per hour.

Now, there is an hint to that restriction also. So, how the drivers know that now I am out of this 30 kilometre restriction zone. So, this is the sign restriction end sign is installed there. So, it is circular with white background and diagonal band of black colour at 45 degree angle, sloping downward from right to left. So, exactly the way it is shown. So, if you see this kind of sign, you know that whatever restrictions were communicated to you, now, those restrictions are removed.

As people are not very familiar to this sign, so, what normally we do we put another board signboard, so if was 30 before that it was 80 or 60 whatever it is then where the 30 kilometre speed restriction zone ends, we put another 60 kilometre per hour board just to indicate users now you are back to again 60 kilometres per hour speed zone but ideally we should use this restriction end sign.

Next compulsory direction control sign they are again circular shape with blue background. Here the background is different blue background and white border and symbols are in white. Compulsory direction control, understand that. Earlier what I said prohibition, straight not allowed but it could be other way. Compulsory straight you cannot go in other way or compulsory right. So, how you communicate? You communicate through this compulsory direction control sign.

So, first one you can say if there is a blue background, circular shaped white border and then white arrow sign pointing towards left that means all the vehicles which are approaching and if you see that sign you should actually move to the left side not to any other side. Second one maybe you are allowed to go either straight or left. Third one you are allowed to go compulsorily, you have to go either straight or right.

Compulsory sound horn, the other case you have said prohibitory sign, no horn. That is different and here it is compulsory sound horn maybe at certain car we just saw sight distance is not available such kind of signs may be installed that compulsory a driver should actually use horn.

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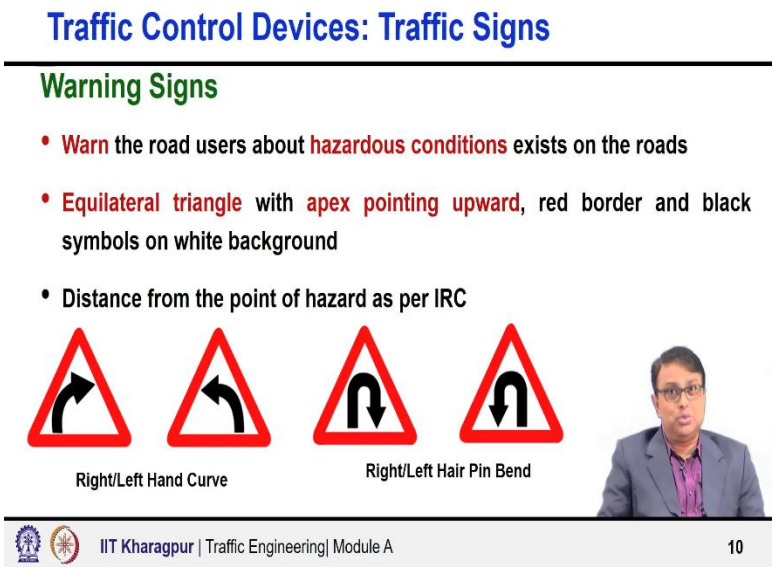

Next coming to the category these are all so far what we discussed are obligatory signs, you have to obey those signs. You have to respect those signs, violation of those are offense and punishable by law. Warning signs, the purpose are very different. Purpose is very different, warning signs the purpose is very different. Why these are installed? If you are driving on a stretch of road, whatever you are experiencing now unless you are informed in advance, you would expect that you would continue to encounter the same environment.

But maybe there is a right turn curve there is a left hand curve or there is a hairpin bent, left or right and in all such cases, if the driver divers are informed in advance then the divers become alert that I am going to encounter this and you have seen I have discussed this also, if drivers are informed, then their perception reaction time will be lower, they can act more promptly wherever it is required to either stop the vehicle or change the lane, change the speed whatever manoeuvre is appropriate.

So, it is good to inform driver in advance to create a safer road environment. So, these are all the signs which are actually to inform driver to warn driver about certain unusual situation or certain things which otherwise normally they would not expect. So, all these signs are equilateral triangle with apex pointing upward. Do you remember my discussion I said when I said give way sign that apex downward, Now all the warning signs are apex upward. Both are triangular shape but here triangular shape apex pointing upward, red border black symbol on white background.

Remember that, if there are such unexpected things which you feel that drivers should be warned in advance, then they should be warned in advance not at the location where the sharp bent is there. Or if there is a speed breaker it should be informed in advance not next to the speed breaker you will install the sign that means drivers do not get they can okay they see the sign they see the speed breaker also.

So, there is no time for them to react, no time for them to reduce the speed in advance expecting that such kind of things they are going to encounter. So, all these are to be informed to driver. All these are to be informed to driver well in advance.

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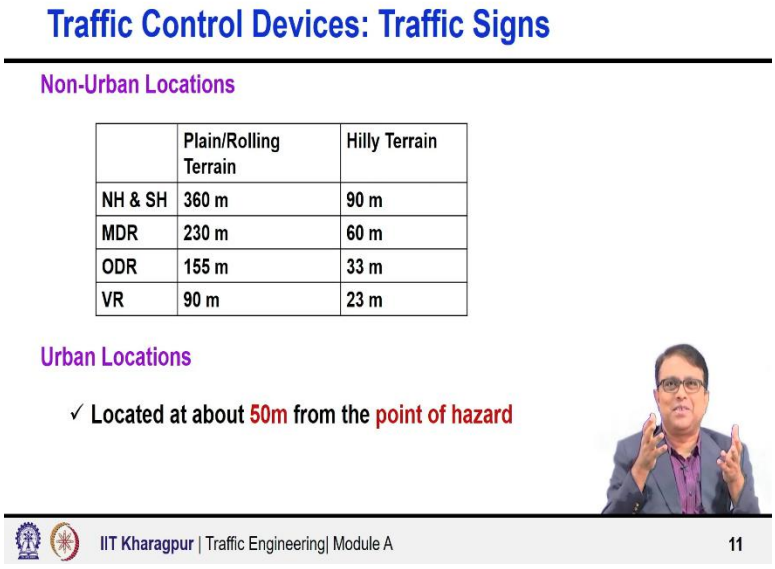

So, how much distance should be there? These are actually mentioned in the IRC code. So, for plain and rolling terrain favourable conditions, So relatively higher values, then in hilly terrains, hilly terrains not so much of in advance because speed also will be lower expectedly and then again, as you go from NH, SH to MDR to other district road ODR to village road, the speed also will be reduced. So, your actually the distance also will be lower.

So, you can say maximum advance distance is for NH, SH followed by MDR, ODR and then village road. Similarly, for all the cases whatever are the values for plain and rolling terrain, the hilly terrain, values are relatively lower. Again because of the change of the speed because of the terrain condition.

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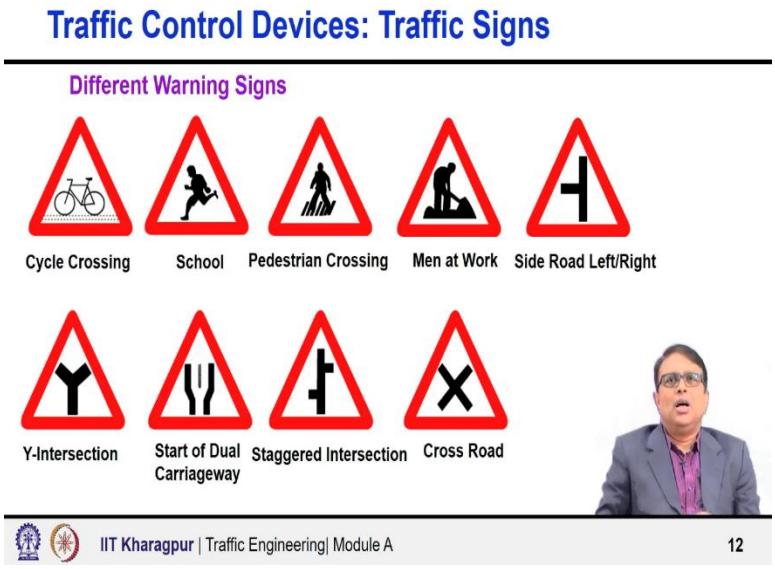

Next, we are showing different types of warning signs. Here in the previous slide, I showed also some of them left and right hand car, right or left here pin bend. Here we are so in some more things, say for cycle crossing, school zone ahead. That is the indication very, very important, then pedestrian crossing ahead. So, drivers should know that there is a pedestrian crossing ahead and people will actually pedestrians would like to cross.

Men at work and Y intersection, start of dual carriageway, maybe you are traveling so far in an undivided road and then certain point onwards, the carriageway is becomes a dual carriageway a divided road. So, the driver should know that the configuration of the cross section is going to change. So, as I said some of the things I have shown here, but there are so many other kinds of warning signs.

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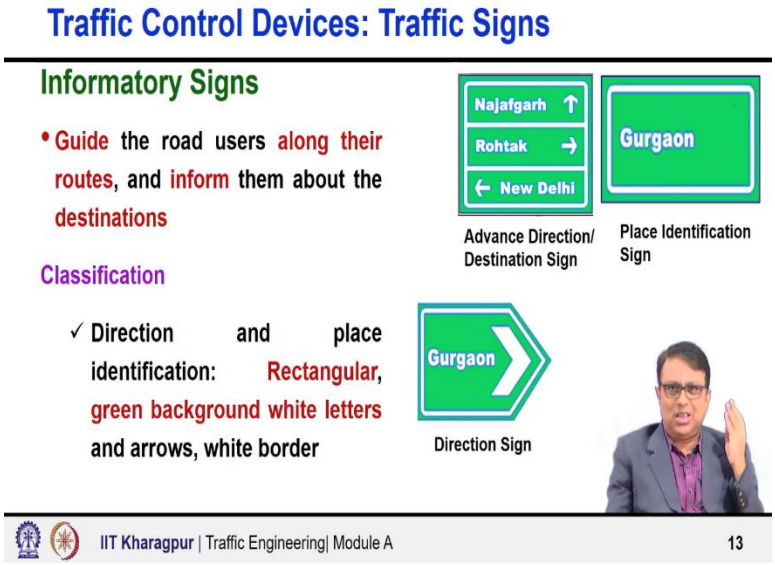

The last is informatory sign. That is the next category. So, obligatory sign or mandatory signs, then cautionary signs, the next is informative signs. What is the purpose of informatory sign? Informatory sign are just for information purpose because when we are driving on roads, we need to know have we reached to the place where I want to go because I may not know all the routes and everything in that locality.

So, you start you should be informed that you have reached to your place, to place location. Sometimes when there are two roads getting diverted on one is going to the left side another is going to the right side, you need to be informed that which direction you should take which road you should take based on your destination. So, if the arrow shows that you move straight for this place and you take the right turn or you take the left turn for this place, accordingly you will take the particular path or particular road.

So, and several other things. So, we want to know where is the fuel station, where the students are there, where the nearest medical facility is available. So, many things we know, we need to know because we sometimes need to actually this kind of services we need to avail. So, this informative sign helps us to do that.

So, guide road users along their routes and inform them about the destinations. So, there are many types of informative sign. One is the direction and place identification as I have shown here, you can see all these are rectangular and then green background white border, white arrow, white colour letter for the place name, all these are very much standardized.

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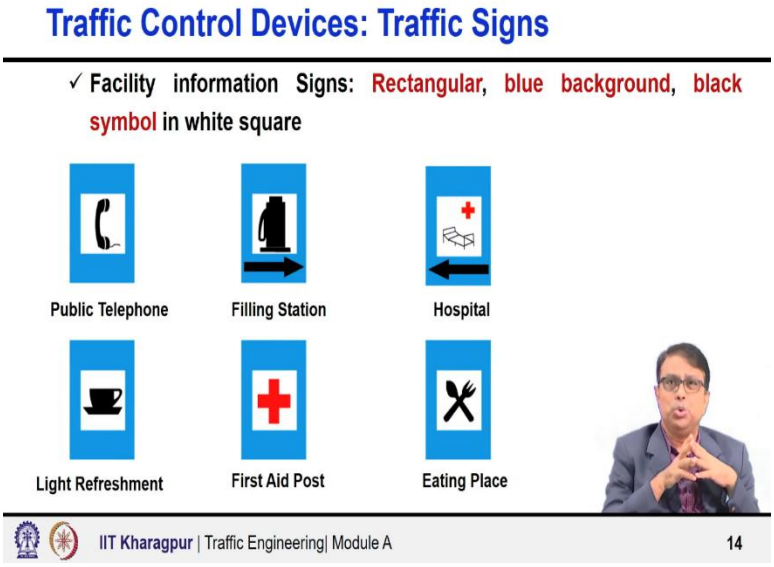

Then facility information sign. All facility information signs should be rectangular, blue background, black symbol in white square, as I have shown it here, many other things first aid post, eating place, hospital, filling station, light refreshments, all these kinds of facilities and services often we need to avail or we want to avail those facilities while driving.

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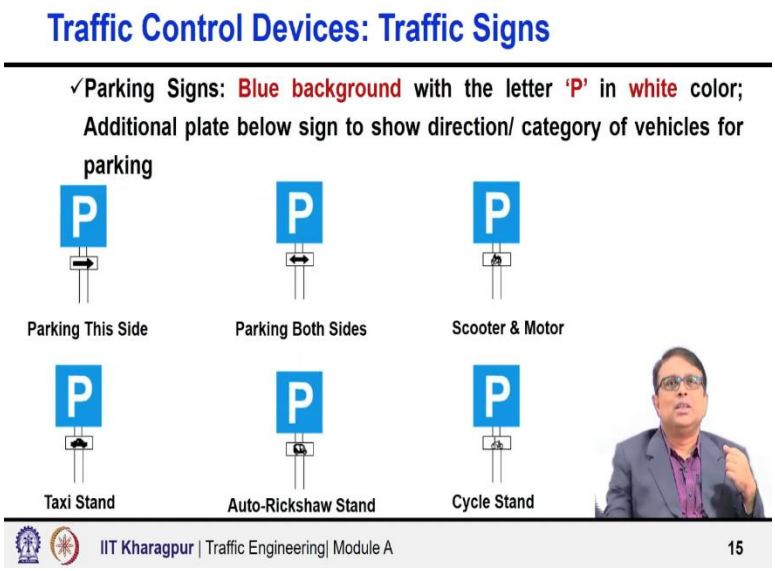

Parking signs where you can do parking, where parking allowed in one direction, both directions sometimes they can kind of information board along with that providing additional details which road user or vehicle user who is parking is expected to know or would like to know they are there.

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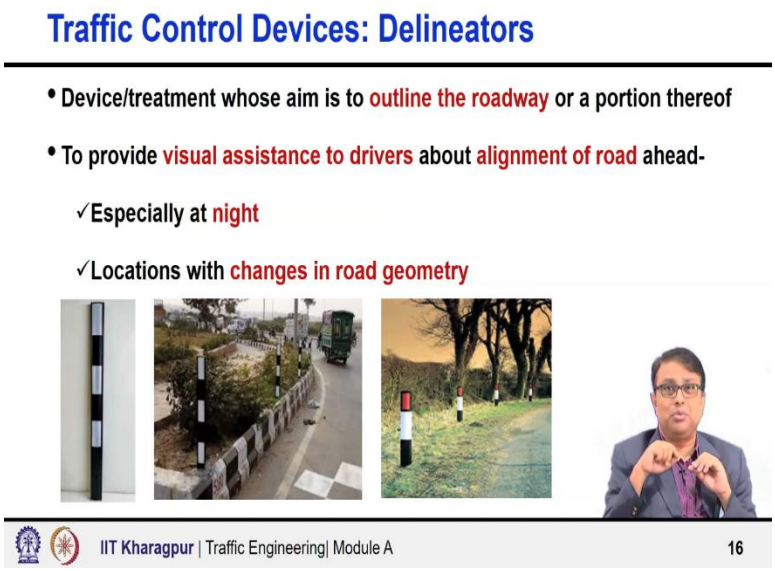

So, these are the three different categories of road sign. As I said that the engineering part of it what should be the height what should be the material, how you do an installation of the sign exactly where you place the sign, the kind of retro reflection characteristics which are required, all such kind of details are available in the IRC guidelines.

Going to the next one is the delineator. What is the delineator? Delineator is any device or treatment whose aim is to outline the roadway or a portion thereof. Now why suddenly we need it? Say during daytime, you can see the road is taking turn or is negotiating a car. Even from far distance, the visibility is better, you can see. Night time, it is all around dark, the road pavement between us pavement most cases is also dark.

So, you really do not know that the road is actually taking a turn because you can only see the portion which is illuminated through the headlight, beyond that all looks dark. So, these are used to provide visual assistance to driver about alignment of the road ahead, especially at night and particularly, at locations with change in the road geometry. Turning left, turning right, negotiating a horizontal curve, negotiating a vertical curve and so on. So, you can see clearly the photographs are very well can explain you or communicate to you clearly.

So, these are the installations or features which help the driver to understand that any change in the alignment of the road. So again, drivers get alerted otherwise driver will travel at normal speed expecting that probably the road is again straight, but the road is actually taking a turn, even daytime sometimes it is important, but more than daytime especially at night, it is important because daytime normally the visibility is much better.

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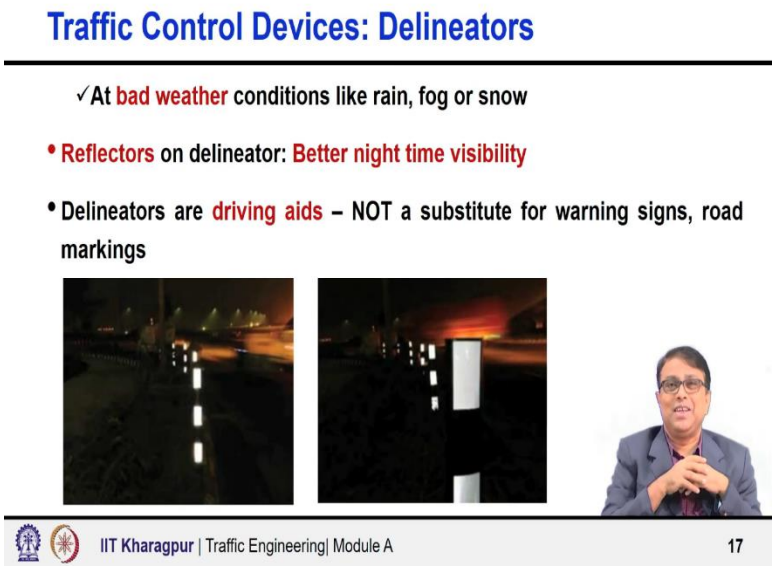

Also at bad weather, when there is fog or rain, the visibility is not so, good. So, there it helps. Often, we say that use reflectors on delineators. These are fantastic I have shown you some photograph you can see, during night time, when the headlight is glowing and you are driving a vehicle and headlight is on you will feel like all the things are almost glowing very, very

clearly and the whole ambient becomes very nice and not that it is beautification, it has a purpose, it has a purpose and the purpose is related to safety of vehicles and road users.

So, you can clearly understand any change in the geometry, any change in the horizontal alignment, any change in the vertical alignment, all these are to be known and you can you can understand them very clearly. So, delineators remember that they are driving aids not a substitute of warning signs and markings, it is not that that since you have delineated you do not use the road sign. Road sign also you have to use, marking also you have to use over and above wherever delineators are required you have to use delineators.

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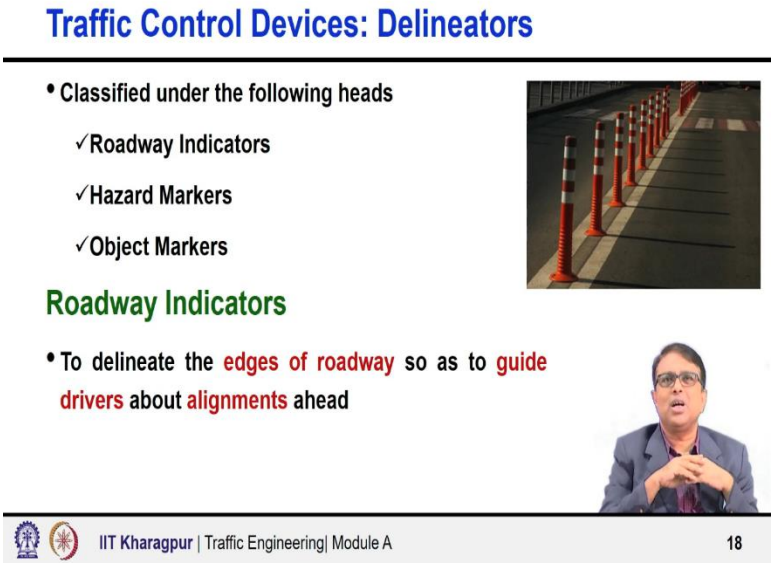

Three types of delineators we used. One is called roadway indicator, hazard marker and object marker. What is roadway indicator? Roadway indicator it depends on classification or is purely based on functions. Roadway indicators' purpose is to delineate the age of the roadway so as to guide drivers about the alignment height, I have been talking to this part mostly. So, whatever I say delineator they are mostly actually roadway indicator.

So, you know the how the path is changing and so, and particularly at bad weather, as I said that very important.

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So, roadway indicated is one thing, then next part is the hazard marker. What are these things? To define obstruction adjacent to roadway or carriageway. Maybe there is a tree very close to carriageway and you could not actually remove the tree for some reasons. So, at least put a hazard marker on that. So, the drivers from a distance also can know there is something hazard there.

Similarly, narrow bridge you can see on both sides, hazard markets are there. So, drivers know clearly these are hazards. That means if I hit on that portion, then I will meet with a road accidents and my vehicle may be damaged and the crash may lead to injury or even death. So, the drivers are warned about that.

Object marking not adjacent to carriageway, but within the drive path within the carriageway. How within the carriageway the things can happen, he just imagine you are approaching and there is a rotary. That rotary is well within the carriageway within that part or maybe you are approaching and the road is now getting divided into two parts left and right, nothing is going straight.

So, the straight tape becomes hazard. It is directly on that path only. So, there you again put object marker to indicate that this is an hazard and this clearly indicates if you put object marking then that clearly indicates that this is an hazard and you should be careful. There are so many ways the hazard markers are used, further details are available in the code.

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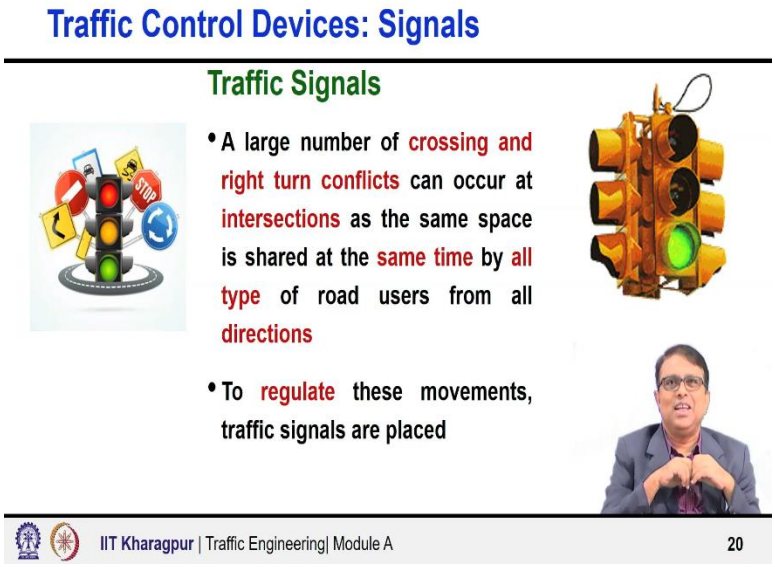

The last but not the least is the traffic signals. A large number of crossings and right turn conflicts can occur at some of the intersections as the same space is shared by all vehicles at the same time. So, we often wherever it is required not that every intersection has to be signalized but there is certain warrants certain prescribed training. So, wherever it is required, we use traffic signal to regulate these conflicting movements and to enhance safety of the overall traffic operation at intersections.

Three colours are used normally are green, amber and red. Often all of you use this traffic signals and we shall discuss a lot about how to install the signal, what are the warrants and how to design traffic signals. So, there are complete multiple lectures will be there on this traffic signals but there is also a very, very valuable and important traffic control device.

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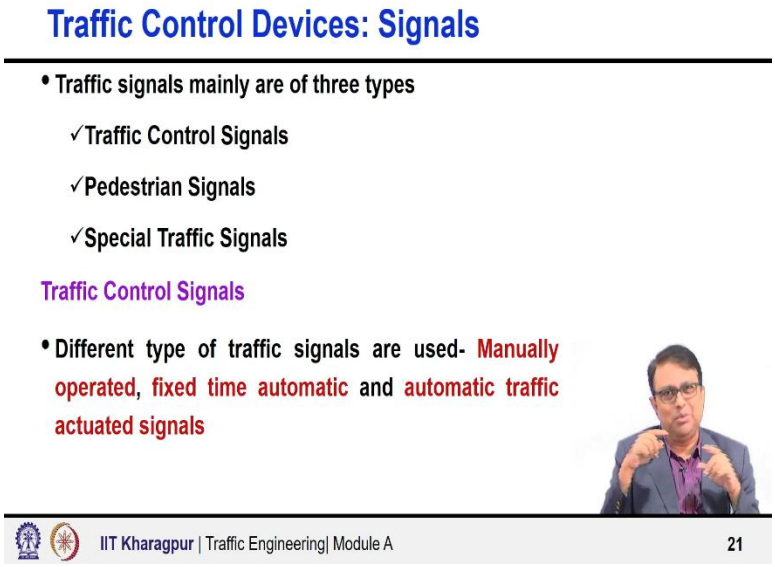

Traffic signals are primarily of three type, traffic control signals purely for traffic control purpose eliminate the conflicting traffic movements motorized vehicle movements. Second is pedestrian signals for pedestrians to regulate pedestrians movement and to enhance their safety and then certain special traffic signal.

So, traffic control signal as I say manually operated it could be fixed time automatic, it could be manually operated, it could be also fully automatic traffic actuated signals that means as it sends traffic accordingly the signal all features signal cycle to fizzing to everything will be done and then, the signal will operate accordingly.

But they are basically for the traffic control purpose. So, could be manually operated could be fixed time automatic could also be automatic traffic activated signal completely based on the traffic automatically the signal timings and everything get decided.

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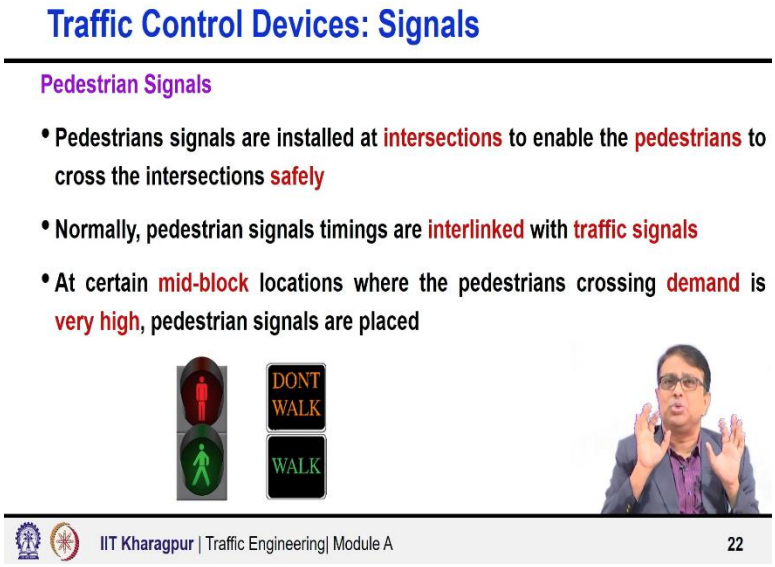

The second one is basically for pedestrian purpose. So, only particularly for to regulate the movement of pedestrians safely. So, you can see the pedestrian green and pedestrian red. When you see the pedestrian green you should cross and comfortably and when it is red that means you are not supposed to walk. So, you have to wait till you get the green pedestrian crossing.

So, pedestrian signals are installed at intersections to enable pedestrian to cross the intersection safely and normally pedestrian signals are interlinked with the traffic signals you can understand very well if there is a pedestrian green, then the traffic is red, if the pedestrian is red, all possibilities the traffic is green.

At certain midblock sections also where pedestrian crossing, you know there is a high demand of pedestrian crossing, we still install pedestrian signals. So, not necessarily at intersection.

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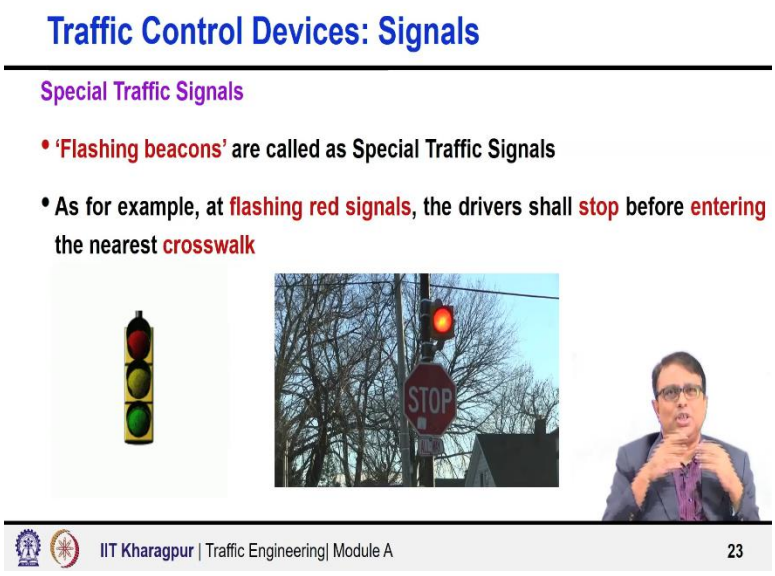

Then special type of signal it is it could be like flashing red or flashing amber. Flashing red is something like stop signs equivalent to stop sign. Flashing amber is equivalent to give way signs. Sometimes in the night time also when the traffic is very low, city traffic operate sometimes with flashing red or flashing amber.

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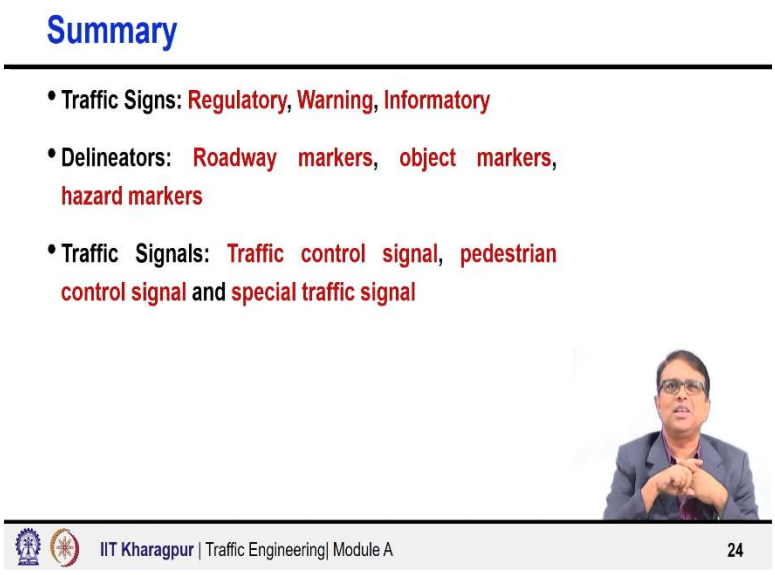

So, altogether we talked about the traffic signs, regulatory, warning and informatory signs. We also discussed about the delineators why we need delineators. Three types of delineator roadway marker, object marker and hazard markers.

Then we also discussed and introduced to you about the traffic signal. There are different types of traffic signal traffic control signals, specifically for pedestrians and also some kind

of special traffic signals. So, with this I close this lecture and that also with this lecture we close module A, the first week complete lecture series. Thank you so much.