

Logistics & Supply Chain Management
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Lecture 48 : Transportation Management

Hello, dear friends. Welcome back to the NPTEL online course on Logistics and Supply Chain Management. Today, we will begin a discussion on the very important topic of supply chain management, which can also be referred to as logistics, specifically regarding transportation management. The original sentence is indeed grammatically correct and does not require any changes. Now we will have a detailed discussion about when we decide on the mode of transportation, how we can design the best routes, and then we will discuss the form of linear programming and how we can optimize the transportation factors to minimize total transportation costs. So, maybe we will have two to three sessions on transportation management.

In this session, we will discuss the major components of transportation decisions. Then, we will talk about the key aspects of load and fleet selection, as well as modes of transportation and logistics flow. Although we have already covered these topics, we will conduct a quick review related to transportation management, as this information is very important for making those decisions.

So, we will examine some key aspects of route planning in transportation. The sentence is indeed grammatically correct as it stands: "We will conclude this session with the case study." (No corrections needed.) The original sentence is indeed grammatically correct. However, for clarity and conciseness, it could be slightly revised as follows: "Transportation: We are now well-equipped with this concept, and we understand that whenever we discuss transporting raw materials from vendors to the manufacturing system or factory, or when the finished goods are completed, we must consider their distribution and transportation.

If we are discussing the doorstep delivery of the product, transportation will also play an important role. Therefore, when talking about transportation, we first need to discuss the load requirements. These load requirements cannot be generalized solely by the weight we are carrying; sometimes, the size of the product is also very important, and at other times, the nature of the product we are transporting is crucial as well. The volume of the

product we are transporting is also very important, so we will discuss different aspects related to this point. The second point is the mode of transportation.

We have seen that, with respect to the customer's requirements, you will choose different types of transportation modes. If you want quick transportation of the product, you will obviously opt for air transportation. If you prefer doorstep and last-mile delivery, then road transportation may be the only option you can consider. If you are talking about the most economically efficient way, then perhaps shipping is the most economical option. If you are discussing transporting goods in bulk, then using rail may be the best choice.

Different scenarios, conditions, and modes of transportation will be considered. Additionally, this particular product will not always be transported exclusively by air. The original sentence is indeed grammatically correct; no corrections are needed. Then, we will discuss what is flowing, which obviously means that resources are moving through that network, and how we will manage that flow. In the end, routing is very important because it helps us find the most efficient route, ensuring that the total cost is minimized.

When discussing load, we must consider the quantity and composition of the goods being transported at a given time. Therefore, when choosing the load, there are several major factors to take into account. The size, weight, volume, and packaging of the shipments are as follows: Having said that, let's consider whether you are transporting something in that container, such as water tanks. If you are transporting a 1,000-liter water tank, the weight will obviously be very low, likely not more than 1 ton, which the truck can carry. You have ten tons, but you are only transporting one ton due to the size of the water tank, and you cannot keep anything inside.

That is one type of industry. Now, let's talk about another type of industry in which we might transport steel rods. So, obviously, we may be utilizing only this much space, but we still reach the maximum load capacity of 10 tons. Additionally, you know that the requirements for the product, in terms of weight and volume, may depend on how you package it. For example, you might be using different sizes of boxes.

Sometimes, the box size may be larger, but you are carrying a lighter product. Other times, the box size may be smaller, but you are carrying a heavier product. The original sentence is indeed grammatically correct. However, if you are looking for a slightly refined version, here it is: "Heavier products occupy a significant volume, which is an important factor to consider when deciding on the load. Additionally, the packaging of the shipment must account for any special requirements based on product characteristics.

For instance, if your products are delicate, they cannot be handled carelessly." The changes made are minimal, primarily involving the removal of the semicolon for clarity. Your original sentence is indeed clear and mostly correct. Here's a slightly refined version for improved clarity and flow: "Perhaps after that, you won't be able to keep much load on that particular package. You also need to consider those constraints.

Additionally, there may be demand patterns arising from different markets, as well as transportation costs and service requirements. These are some of the factors we are considering, and we need to ensure that we are not..." Feel free to let me know if you need further adjustments! Underutilized space is also unavailable, and we are not exceeding that capacity.

While we discuss the situation in which the load may exceed 10 tons, despite the capacity being only 10 tons, the chances of accidents, failures, and damage to the vehicle increase, along with higher fuel costs. Therefore, we need to maximize the utilization of transportation capacity during this transportation algorithm. Minimize the handling costs and ensure the timely delivery of the goods, correct?

However, if you would like a slightly refined version, you could say: "Key aspects of load include load size, which refers to the amount of cargo or goods." The load size and dimensions may be discussed, as I mentioned. You are transporting the water tank, right? When you talk about carrying the steel rods, you are referring to their weight.

The weight of that load size is the determining factor. The decision regarding load size depends on factors such as product characteristics. Sometimes, we transport gases from one point to another, or we may transport hazardous liquids from one station to another. In these cases, we need specialized transportation equipment.

Then we are using a pipeline-type system that should be leak-proof, and we know that we cannot proceed with loading and unloading because we cannot expose those hazardous materials to the external environment. So, these are some of the factors we consider when discussing load sizes. The phrase "load weight" is grammatically correct; however, if you would like to provide more context or a complete sentence, I can help you refine it further. Then again, we need to understand that the total mass of goods being transported is important; both being overloaded and underloaded can hinder efficiency and productivity. If you are overloaded, it is due to the rules and regulations that we must follow while on the road.

The original sentence is indeed grammatically correct; no changes are necessary. The load volume is the space occupied by goods in a shipment, isn't it? So, what we are doing is trying to standardize the packet size that we deliver, correct? So, when we have a uniform packet size, we can maximize space utilization. However, just imagine the online e-commerce market: when we talk about shipping, we are dealing with different packet sizes. From morning to evening, if you are transporting one marker or slide pointer, the size of the packaging will be different.

If you are transporting grocery items, the size will also be different. Similarly, transporting mobile devices, home appliances, or anything else will result in different packaging sizes. So, if you are referring to the Amazon A-to-Z items they are transporting, the cubic size and volume required to ship the products may differ. So, what we are trying to do is make things as uniform as possible. If that is not feasible, we will utilize techniques such as palletization or possibly stacking.

(The original sentence is already grammatically correct.) The original sentence is indeed grammatically correct. However, if you're looking for a slightly refined version for clarity, it could be rephrased as: "By establishing a single pallet size, or perhaps a uniform stack size, we can ensure maximum utilization of container capacity for load packaging. This involves a method of packaging goods and transporting them to ensure that they are adequately protected and secured during transit." This version maintains the original meaning while enhancing clarity.

So, packaging is the first phase when you move or ship your product to the customer. So, if your packaging is damaged, the first impression may be that the product is damaged as well. Sometimes people are so concerned that they get the impression they should return a product simply because the packaging is damaged, even without opening the package. It is important to prevent all damage, spoilage of goods, and theft. Therefore, you need to ensure that the packaging material guarantees the safe transportation of the product from one end to the other.

Then load the composition to see what I was talking about in the last slide. If that's not possible, we have different sizes of packets; how can we identify them? This could also be an opportunity. If we are packing all the large boxes in one truck and there is a small space left, we cannot utilize that space if we are shipping the same product in that truck. So, if we are shipping a mixer, we may consolidate different sizes of packaging, allowing us to utilize that space. Let's recall the example of transporting an empty water tank.

Is there any material we can place inside the empty water tank for transport? If a truck is carrying only 1 ton, how can we ensure that it can carry 2 tons or 3 tons? We need to keep this in mind. We need to ensure that we do not damage the water tank while transporting the primary products. So, I mean, if we can consolidate different products, safety can also be ensured.

Heavy products are kept on one side, while lighter products are kept on the other side. This arrangement can increase the chances of accidents; if not accidents, then there may be damage, increased wear and tear, and higher fuel consumption. Therefore, we need to ensure the optimization of the center of gravity.

It is essential to distribute the load evenly within the container. The original sentence is grammatically correct; no changes are needed. The original sentence is indeed well-structured and grammatically correct; no corrections are needed. The original sentence is indeed grammatically correct. However, if you want a slightly polished version, you could say: "If your customers are buying quickly in small quantities, you may need to replenish the inventory promptly, correct?" The sentence, "So, how can you do that?" is indeed grammatically correct; no changes are needed.

The sentence is indeed grammatically correct as it stands; no corrections are needed. (Note: The original sentence is already grammatically correct and does not require any changes.) No corrections are needed. (Your original text is already correct, so no changes are necessary.) The original sentence is indeed grammatically correct; no corrections are needed.

The original sentence is indeed grammatically correct. However, if you're looking for a slight rephrasing for clarity, you could say: "Considering all those factors and the customer's service level requirements, you need to choose either air delivery or last-mile delivery by road." (Note: The original sentence is already correct, so no changes are necessary.) The original sentence is grammatically correct, so no changes are necessary. The original sentence is indeed grammatically correct.

However, if you would like a slightly refined version, you could say, "Geographical coverage is also a very important factor when discussing fleet selection, isn't it?" The original sentence is grammatically correct and does not require any changes. The original sentence is grammatically correct; no changes are necessary. The original sentence is

indeed grammatically correct. However, if you would like a slightly refined version, it could be: "This is how you know that geographical reasons can sometimes impose restrictions. Additionally, local conditions such as weather, traffic, and cargo characteristics all play a role.

" This version removes "So" from the beginning for a more formal tone. The original sentence is indeed grammatically correct and does not require any changes. The original sentence is grammatically correct as it stands; no corrections are needed. Cost considerations include the total cost of ownership, not just the transportation cost. You should consider all the costs involved in moving from one point to another.

The original sentence is indeed grammatically correct; there are no errors to correct. The original sentence is indeed grammatically correct. However, if you are looking for a slight refinement for clarity or style, you might consider the following version: "Technology and optimization are crucial, especially when making data-driven decisions about route selection, particularly if this process is supported by software. This approach helps eliminate subjectivity. Therefore, whatever parameters we set—such as distance, weather conditions, and road conditions—can be managed effectively.

" This maintains the original meaning while enhancing clarity. The sentence is grammatically correct as it is. However, if you want to make it slightly more formal, you could say, "The overall performance parameters are correct, are they not?" The sentence is already grammatically correct. However, if you're looking for a slight rephrasing for clarity, you could say, "These parameters are configured in our software, which helps us select the best route." The original sentence is grammatically correct as it is; no changes are needed.

Your sentence is indeed grammatically correct. If you're looking for a slight rephrasing for clarity, you could say: "So, how can we use that type of software to ensure delivery? Is that accurate?" (Note: The original sentence is already correct, so no changes are necessary.) Your sentence is grammatically correct as it is; no corrections are needed. If overloading is performed, it is also a check that you need to carry out. The manpower you are utilizing, their qualifications, and the number of service hours play significant roles. If they drive for a long time, the chances of accidents increase.

(Note: The original sentences are grammatically correct, and no changes are necessary.) The original sentence is grammatically correct as it is; no corrections are needed. The

original sentence is indeed grammatically correct. However, if you're looking for a slightly refined version, you could say, "Sometimes, for some reason, the entry of BS3 and BS4 engines may be restricted." This maintains the original meaning while being clear and concise.

The original sentence is indeed grammatically correct. However, if you would like a slightly clearer rephrasing, you could say: "So, in that case, how do you need to transport while using only the BS5 or BS7 engines?" If you have a specific aspect you would like to change, please let me know! The original sentence is indeed grammatically correct; no changes are needed. The sentence is already grammatically correct as it is: "So, how can you scale up your transportation system to provide services in that area?" The sentence is indeed grammatically correct as it stands; no corrections are needed. (Note: The original sentence is already correct and does not require any changes.) The original sentence is grammatically correct, and no changes are necessary. Here is one example: we have the location from which we are shipping the products, and we also have three different cities.

Where do we want to ship the products: Topeka, Kansas, and Beechita? The original sentence is grammatically correct as written; no changes are needed. The sentence is grammatically correct as it is; no changes are necessary. The original sentence is indeed grammatically correct, and no changes are needed.

The rate is 3.42, so this is the total cost. For this city, we need to transport 70 pounds, and this is the rate. This is how we can calculate the total cost for Day One, which involves transporting to all three cities. (Note: The original sentence is grammatically correct, so no changes were made.) The original sentence is mostly clear, but I can make a few minor adjustments for improved clarity and flow. Here's the revised version: If I calculate in the same way for day two for all three cities, then, again based on your load requirements, your total transportation cost will change.

This is because if you are adding more units up to the maximum capacity that a full truckload can hold, and if you are only utilizing 200 units instead of 400, the per-unit cost will obviously be a little higher. If we ship 250 items, the per-unit cost will be slightly lower, and if I ship 300 items, it will be reduced even further, correct? The original sentence is already grammatically correct. However, for clarity, you might consider breaking it into shorter sentences or adding some transitional phrases. Would you like me to do that? The original sentence is indeed grammatically correct; no corrections are needed. The original sentences provided are already grammatically correct, and no changes are necessary.

However, if you would like a slightly refined version for conciseness, you might

consider: "On the same day, we can calculate the total cost for day three. If we include all the days for all three cities, can I confirm that the total cost is \$2,350?" This version maintains clarity while being slightly more concise. The original sentence is indeed grammatically correct; no corrections are needed. The sentence is already grammatically correct; no changes are needed. For three days from Topeka City, the total quantity required is 480 units.

The sentence is already grammatically correct; no changes are needed. The sentence is indeed grammatically correct as it stands; no corrections are needed. The reduced cost will be presented, and for Kansas City, the per-unit cost for 400 units has been further reduced because we are shifting more units. (Note: The original sentence is grammatically correct and does not require any changes.) It seems that "units" is just a single word and may not need correction.

If you meant to provide a longer sentence or context, please share it, and I would be happy to help! The original sentence is indeed grammatically correct; there are no errors to fix. So, if I calculate now, you can just compare: in the case of individual day transportation, the total cost was 2,350, but now it only applies when we consolidate. Corrected version: So, if I calculate now, you can simply compare: in the case of individual day transportation, the total cost was 2,350, but now it only applies when we consolidate. The original sentence is indeed grammatically correct, and no changes are necessary. However, if you would like a slightly refined version, here it is: "Now, there are two points to consider when we do this.

One is that you are currently waiting to deliver, or perhaps you are waiting to consolidate those orders. Additionally, you are waiting to receive only the orders for the next two or three days before processing them, which will increase the lead time." The original text does not require any grammatical corrections. The original sentence is indeed clear and well-structured. However, if you're looking for a slightly refined version, here's an option: This is one thing: if you are waiting for three days—on the first day, you receive an order but do not ship; on the second day, you receive another order but still do not ship; and now, after three days, you are consolidating all the orders before shipping—this will increase the lead time.

However, let's consider another approach: shipping only on the first day. The original sentence is grammatically correct as it stands. No corrections are necessary. The original sentence is grammatically correct and does not require any changes. The original sentence is indeed grammatically correct, so no changes are necessary.

So, if the distance is very small, you may only be shifting by road. In that case, you might use it frequently, or if quick delivery is required, you may opt for air shipment. Consider the transit time and the maximum time you have available. For transporting over long distances, shipping by sea might be the best option. If you are considering costs, then shipping by sea would be suitable, and the next option could be shipping by train.

The original sentence is grammatically correct. However, if you'd like a slightly refined version, you could say, "You also need to keep in mind the importance of reliability, as you must be able to depend on it when transporting goods by ship." The original sentence is indeed grammatically correct; no changes are necessary. The safety of the material you are handling is also an important factor that you should take into account. The original sentence is grammatically correct. However, if you would like a slight rephrasing for clarity, you could say, "If you are discussing environmental sustainability, using a ship is the best option because it has a minimal carbon footprint."

" So, we will quickly go through road transportation when transporting goods via roads or streets. The biggest advantage of this is that it allows for door-to-door delivery, right? The sentence is indeed grammatically correct; there are no errors to correct. The original passage is indeed grammatically correct; no changes are necessary. Your original sentence is indeed grammatically correct. However, if you're looking for a slightly refined version for clarity, it could be: "So, you need to consolidate large quantity orders, but there are challenges such as traffic conditions, weather conditions, and regulatory restrictions."

Sometimes, trucks may not be able to operate during daytime hours." No changes are necessary, but you could also consider removing the repetition of "conditions" for variety: "So, you need to consolidate large quantity orders, but there are challenges such as traffic, weather, and regulatory restrictions. Sometimes, trucks may not be able to operate during daytime hours." This version maintains the original meaning while enhancing clarity. Your original sentence is indeed grammatically correct. However, for improved clarity, you might consider rephrasing it as follows: "Therefore, to manage traffic, there are many factors to consider when discussing large cities, correct?" This sentence is already correct, but if you're looking for an alternative, you could say: "Therefore, to manage traffic effectively, there are many factors to consider when discussing large cities, right?" Both sentences are grammatically correct.

But yes, another challenge is the higher cost per mile, which is either 3 rupees per kilometer or 4 rupees per kilometer. The sentence "That is one challenge" is grammatically correct as it stands. The original sentence is grammatically correct, but I

can suggest a slight improvement for clarity: "Talking about rail transport, we obviously consider the medium, which is the mode of transportation for trains. We will then discuss the main characteristics: it is suitable for long-distance shipments, bulk cargo, and heavy goods.

" This version maintains the original meaning while enhancing clarity. The original sentence is already grammatically correct. However, if you're looking for a slight rephrasing, you could say, "Thus, it offers high capacity, energy efficiency, and cost-effectiveness for large quantities." The original sentence is grammatically correct, so no changes are necessary. The original sentence is grammatically correct and does not require any changes.

The original sentence is grammatically correct and does not require any changes. From one point to another, this is not possible due to weather conditions, port congestion, and other factors. Therefore, it is supported only by road transportation. Air transportation offers speed, reliability, and global connectivity, which are advantages for quick delivery. This allows for a reduction in lead time and the maintenance of perishable items, ensuring that the quality of the products is preserved.

However, challenges do exist. (The original sentence is already grammatically correct. No changes are necessary.) The original sentence is grammatically correct, and no changes are necessary. The sentence is indeed grammatically correct; no changes are necessary. The original sentence is grammatically correct. However, if you would like a slightly more polished version, you could say, "It can infect the entire environment that we must take care of.

" The original sentence is indeed grammatically correct and does not require any changes. The original sentence is indeed grammatically correct, but it can be slightly refined for clarity: "Your special fleet and road transportation are important; however, when we discuss quick delivery overseas, we can use air transport among other options." The addition of a comma before "among" is not necessary in this case. Here is a refined version: "Your special fleet and road transportation are important; however, when we discuss quick delivery overseas, we can use air transport among other options." This version maintains the original meaning while ensuring grammatical accuracy.

(Note: The sentence you provided was already correct and did not need any changes. Therefore, the response remains the same.) The original sentence is grammatically correct and does not require any changes. The original sentence is indeed mostly correct,

but it can be slightly refined for clarity and flow. Here is a revised version: "Here are all the points we need to keep in mind when selecting different modes. Here is another example: the finished goods are to be shipped from plant inventory to warehouse inventory, some distance away, and this is the annual volume to be shipped.

The product is worth \$25 per pound." The main change made was adding a comma after "warehouse inventory" for better readability. The plant and carrying costs are 30% per year. (Note: This sentence is grammatically correct as it stands. If "plant" refers to something specific, you may want to clarify it for better understanding.

) The original sentence is grammatically correct as it stands; there are no errors to correct. The original sentence is indeed grammatically correct; no changes are needed. The original sentence is grammatically correct. However, if you want a slightly refined version, you could say, "You can see here that the minimum applies to the rails." The original sentence is grammatically correct. However, if you'd like a slightly clearer version, you could say: "In-transit inventory: How much inventory are you taking to ensure that the inventory carrying cost is 30%? Is that correct?" (Note: The original sentence you provided is already grammatically correct, so no changes are necessary.

) The sentence is indeed grammatically correct; no changes are needed. The original sentence is grammatically correct as it is; no changes are necessary. The original sentence is grammatically correct. However, if you would like a slightly more polished version, you could say, "You can multiply and divide by 365 days in a year to calculate the in-transit inventory costs, correct?" The original sentence is indeed grammatically correct, but here's a slightly refined version for clarity: "Reassess your plant inventory to determine the average amount of inventory you are carrying. This will allow you to calculate the inventory carrying cost, which is 30 percent. Additionally, you can ascertain the value of each product per unit and the number of units you are transporting to calculate the total cost.

" (Note: The original sentence is already grammatically correct, so no changes are necessary.) The sentence is grammatically correct as it is; no corrections are needed. The sentence is correct as it is: "So, that is 30 percent." Your revised version is indeed grammatically correct. Here it is again with a minor adjustment for improved clarity: "So, you can see that if I calculate the cost for rail, it is somewhere here for trucks; the cost of road transport is minimal, while the cost of air transport is maximal.

However, truck transport is not sustainable." This maintains the meaning and enhances clarity. The original sentence is indeed correct as it stands: "Carbon emissions are highest when using road transportation." The original sentence is grammatically correct and does not require any changes. The sentence is already grammatically correct; no changes are needed. That is one component we have already discussed, so let's quickly review it. Information is another component—a logistical element that flows through this network and then returns from the customer.

In terms of predicting demand, if we want to plan for inventory, order processing, and decision-making, any additional features you add will incorporate this information. From the customer's end to the manufacturing end, the financial flow differs when using an online e-commerce platform. With delivery, you receive cash only at the time of delivery. However, if you are selling goods through retail stores, where sales may be made on credit, it can take longer to liquidate your assets. Additionally, there is a possibility of incurring losses on those assets if the customer does not pay on time.

The original sentence is indeed grammatically correct. However, if you're looking for a slightly refined version, here it is: "That is another point: reverse flow. We discussed how, when products are not liked by customers, they are simply sent back. Therefore, returns, repairs, recycling, or disposal (if the customer has used the product) also need to be managed. This return flow is very important for maintaining customer satisfaction and loyalty at the highest level.

" The only change made was replacing "talked" with "discussed" for a more formal tone. The next point is that we have discussed these three flows in detail. We have provided a quick overview of the aspects of route planning in transportation. Now, regarding route planning, it involves the strategic selection of optimal transportation routes. The original sentence is indeed grammatically correct. However, if you're looking for a slight rephrasing for clarity, you could say, "That depends on factors such as distance, time, cost, capacity, and mode of transportation, doesn't it?" This maintains the original meaning while confirming its correctness.

The original sentence is indeed clear and grammatically correct; no changes are necessary. Minimizing total transportation costs and reducing transit times optimize resource utilization. Obviously, if we take care of the total transportation costs, everything will be managed correctly. The original sentence is indeed grammatically correct, but if you're looking for a slight refinement, you could say: "Yes, the challenges

include traffic, road conditions, weather conditions, regulatory restrictions, and geopolitical considerations as well." Removing "but" at the beginning makes it more straightforward, though it is not necessary to change the meaning.

The sentence "This is what I was talking about" is already grammatically correct; no changes are needed. The original sentence is grammatically correct; no changes are needed. Now, this supplier is supplying this factory, that factory, and another factory as well, correct? The original sentence is indeed grammatically correct; no changes are needed. Can we manage all the supplies related to this factory from Supply C to Plant 3 since we can minimize the total costs? We have an algorithm that lists all the sources, records the demand, and then finds the minimum possible cost to transport this material from one end to the other, allowing us to minimize the total transportation costs. (The original sentence is already grammatically correct.) In the upcoming sessions, we will discuss in detail how we can use that transportation algorithm to minimize total transportation costs.

The original sentence is indeed grammatically correct; no changes are needed. The original sentence is already grammatically correct. But this does not include the cost of spending more than 1 billion on managing platform software solutions and acquiring software solutions, such as warehouse management systems and transportation management systems. These solutions are implemented to minimize transportation distance costs. Therefore, if you can save time through your retail channel, it translates to saving money.

How can you save time? By reducing the... The transportation time is sufficient. (Note: The original sentence is already grammatically correct.) The original sentence is indeed grammatically correct; no changes are needed. The original sentence is indeed grammatically correct; no changes are needed. The sentence is already grammatically correct. Here are some successful examples where you can see that the Polaroid Corporation uses a TM solution from HighJump Software to achieve the lowest-cost carrier rates.

Here's a corrected version of the sentence: "The way they can choose the best fleet option is by using this software, which they utilize from the manufacturing plant to the retailer in the U.S. and Canada to implement the solution." (Note: The original sentence is grammatically correct; no changes are necessary.)

) The Tree of Life is another distributor of food packages. (Note: The original sentence

is grammatically correct, and no changes are necessary.) They have improved their inbound freight efficiency from 55% to 75%, and the credit goes to the transportation management software from JDA Software. Additionally, there is another software provided by Lean Logistics TMS, which is used by Orange Glow to improve its on-time delivery rate. We can conclude that data-driven decisions are necessary to minimize total transportation costs, as we cannot simply calculate which route will take the least time, cover the shortest distance, and incur the lowest cost. We can deploy this type of software to determine the best carrier options and how to minimize total transportation costs, from carrier selection to routing and scheduling.

So, that is all for this session. In the next session, we will discuss transportation decisions and how we can reduce total transportation costs by implementing transportation algorithms. So, these are the reference books you can use: 'Operations Research' by Taha H. H. Al-Sharif, which includes a chapter on operations research; 'Transportation Management'; and 'Resource Management Techniques'. You may consider these references. That's all. Thank you very much.