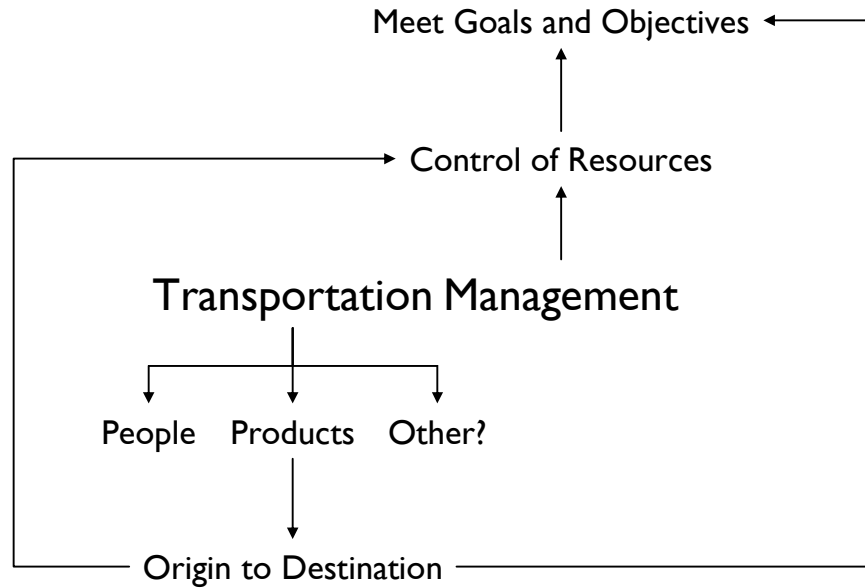


## 2. Transportation Basics

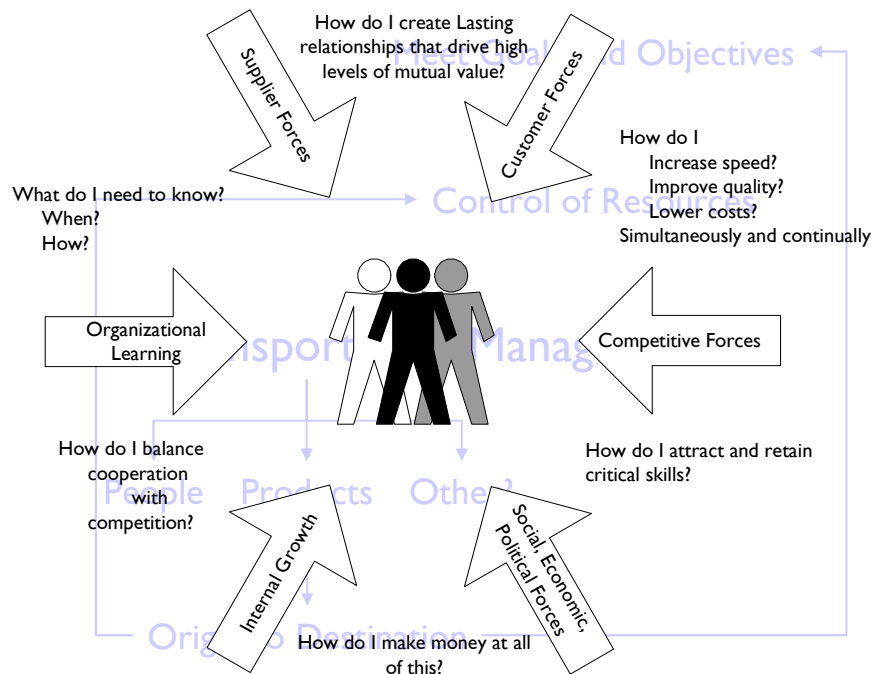
### Introduction

We can't always be clear as to the level of understanding of transportation possessed by students. This presentation therefore introduces transportation in a fundamental way using, as a point of departure, the general and admittedly abstract structure presented in Introduction to the Course and Transportation Management.



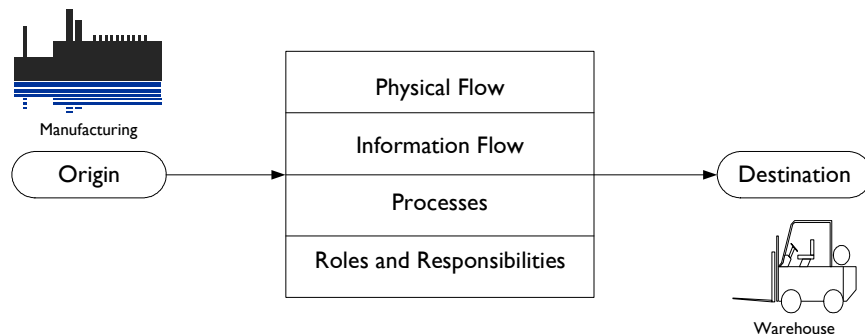
**Figure 1 Structure of Transportation Management**

We also noted in the introductory presentation that we would consider the role of the person in transportation management.



**Figure 2 Business Drivers and Critical Questions**

We also noted that the examination of transportation management would consider a number of themes.



**Figure 3 Transportation Management Themes**

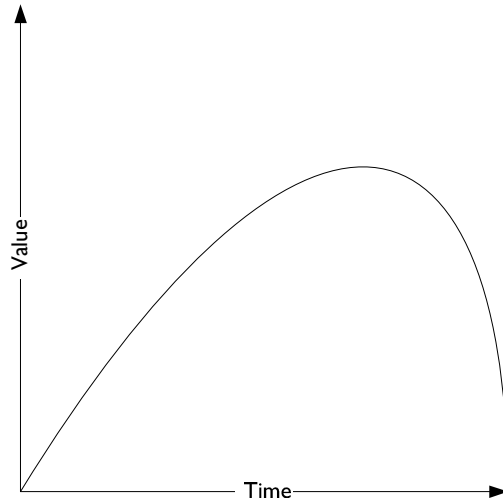
The thinking here is that if one can understand transportation management in terms of business drivers, critical questions, and themes, then one has the basis for improving the performance of the transportation business.

We will proceed from the simple to complex transportation, from local to global transportation, developing along the way the deeper understanding to which I refer.

## In the Beginning

Transportation is a derived demand. The New York Mass Transit Authority does not exist because people want to ride the subways, although people who wish to do this do exist, but because people need to get from one place to another place. They are demanding this transportation. This demand emerges because they are of more value to themselves and others if the move from where they are to where they want to be.

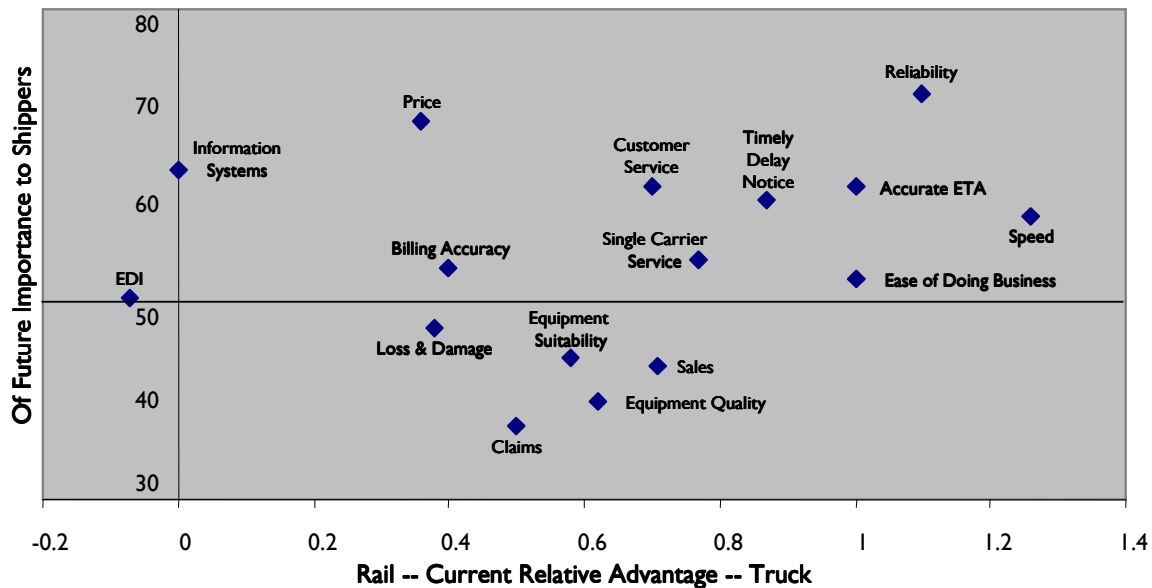
Transportation therefore provides what the economist would call time and place utility.



**Figure 4 Time and Value**

Here, we consider the value that accrues to a person from being at a certain place and at a certain time. That time is when the curve is at its peak ( $dY/dX = 0$  to the mathematicians amongst you). Transportation management is about finding that moment. Of putting the right product in the right place at the right condition and right price such that the customers prefer the product over a competing product.

Now, some of us travel by bus and some by limousines. The origin and destination may be the same, the time which we need to be there (say, starting time at the office) may be the same, but the mode of transportation may differ. That is, there is something more than just time and place utility that enters into transportation decisions.



**Figure 5 Transportation Buying Behavior (circa 1994)<sup>1</sup>**

Figure 5 Transportation Buying Behavior (circa 1994) resulted from a study of how the buyers of transportation make decisions when choosing between truck and rail. There are 16 items in this chart

<sup>1</sup> This chart was picked up long ago from Mercer Management Consulting. Other details regarding its provenance have long since disappeared.

defining buyer behavior. These factors are arrayed in the x-dimension according to the relative advantage that one mode has over the other (Mercer's approach to deciding relative advantage is lost in my memory). Along the y-dimension the factors are arrayed according to their future importance to the buyer. In a sense, this is a different way of presenting strengths, weaknesses, opportunities, and threats (SWOT).

So, time and place utility may be the major driver of the decisions that produce the demand for transportation, but the utility function is not the only determinant. It is the sum total of the buying behavior that causes one to choose the bus or the limousine.

## The Simple Example

Let's suppose you've gone shopping.



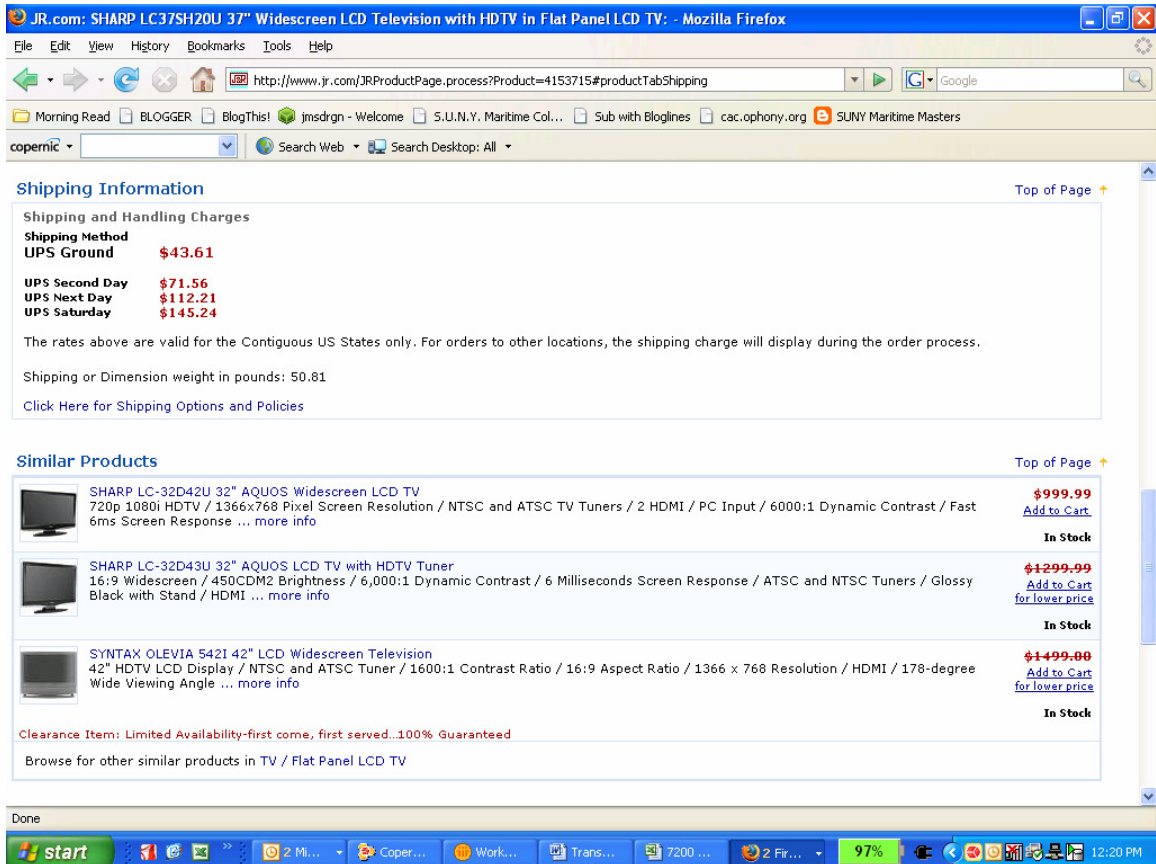
Figure 6 A Source of Demand

J&R in New York City, through an advertisement in the Sunday, February 3, 2007 issue of the New York Times, has attracted your attention to widescreen LCD television. You access the J&R site and make your way to the page shown in Figure 6 A Source of Demand.<sup>2</sup> After perusing the product specifications and thinking about how the Sharp will fit into your décor and electronics configuration, you decide to buy.

You have decided that wherever the LC37SH20U is at the moment, it would have more value to you if it were somewhere else.

You wonder about how the device is going to get to you. You note under BUYING INFO that the unit will ship in 1 – 2 business days and that additional Shipping Info is available.

<sup>2</sup> <http://www.jr.com/JRProductPage.process?Product=4153715> [February 5, 2007]



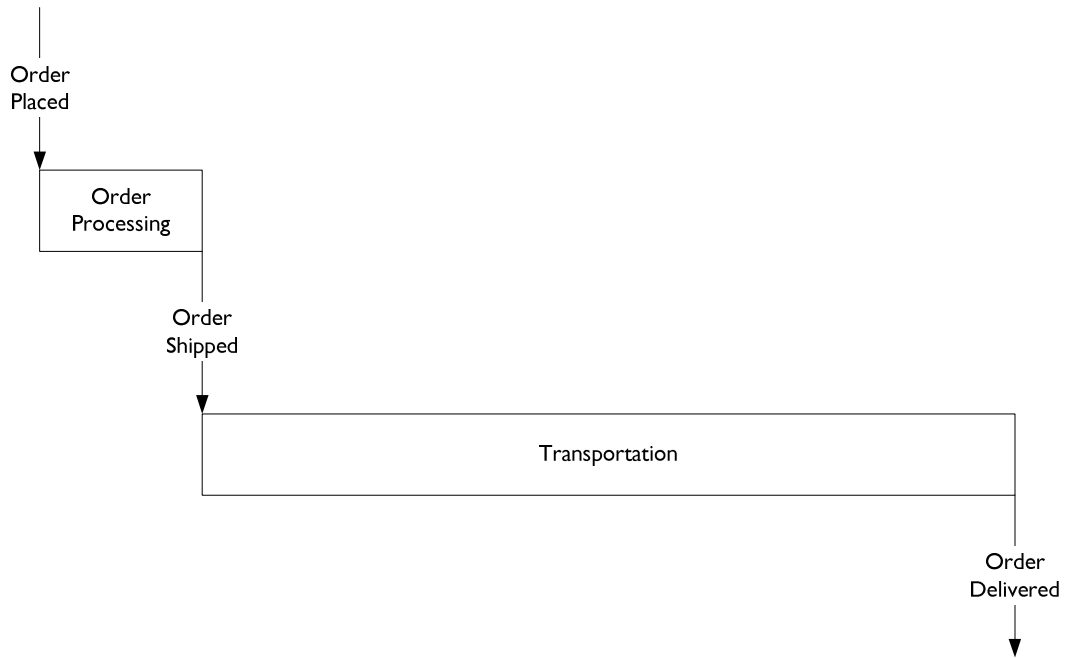
**Figure 7 Shipping Information**

You Click Here for Shipping Options and Prices and find:

“Estimated shipping times are provided on our website on the individual product listings. For example "usually ships in 1-2 business days", "...3-5 business days", "...5-7 business days". The number of days the order takes to reach you depends upon the shipping method you chose and your location. For example, if you chose an item with an availability of "1-2 business days" and you choose a shipping method of "2 Day Air", your order will reach you in 3 or 4 business days. Ground Shipping can take between 3 and 10 days, depending on what part of the country you are shipping to (East Coast is the shortest, West Coast takes the longest). "Business days" do not include Saturday, Sunday or Holidays. Some items may list a stock status of "temporarily out of stock". This means we are waiting for our next shipment from the manufacturer. We receive daily shipments from our various distributors; pre-ordering this item will automatically prioritize your order once we receive this item.”<sup>3</sup>

The following picture made begin to form in your mind.

<sup>3</sup> [http://www.jr.com/templates/information/pop\\_shippingHelp.tem#G04](http://www.jr.com/templates/information/pop_shippingHelp.tem#G04) [February 6, 2007]



**Figure 8 Order Fulfillment**

The order fulfillment cycle as 12 days (2 in order processing; 10 in transportation). You are now faced with the decision of evaluating the place and time utility proposed by J&R and UPS. UPS gives an opportunity, for a price of course, to substantially shorten the transportation portion of order fulfillment.

You decide to accept the 12 days and place the order.

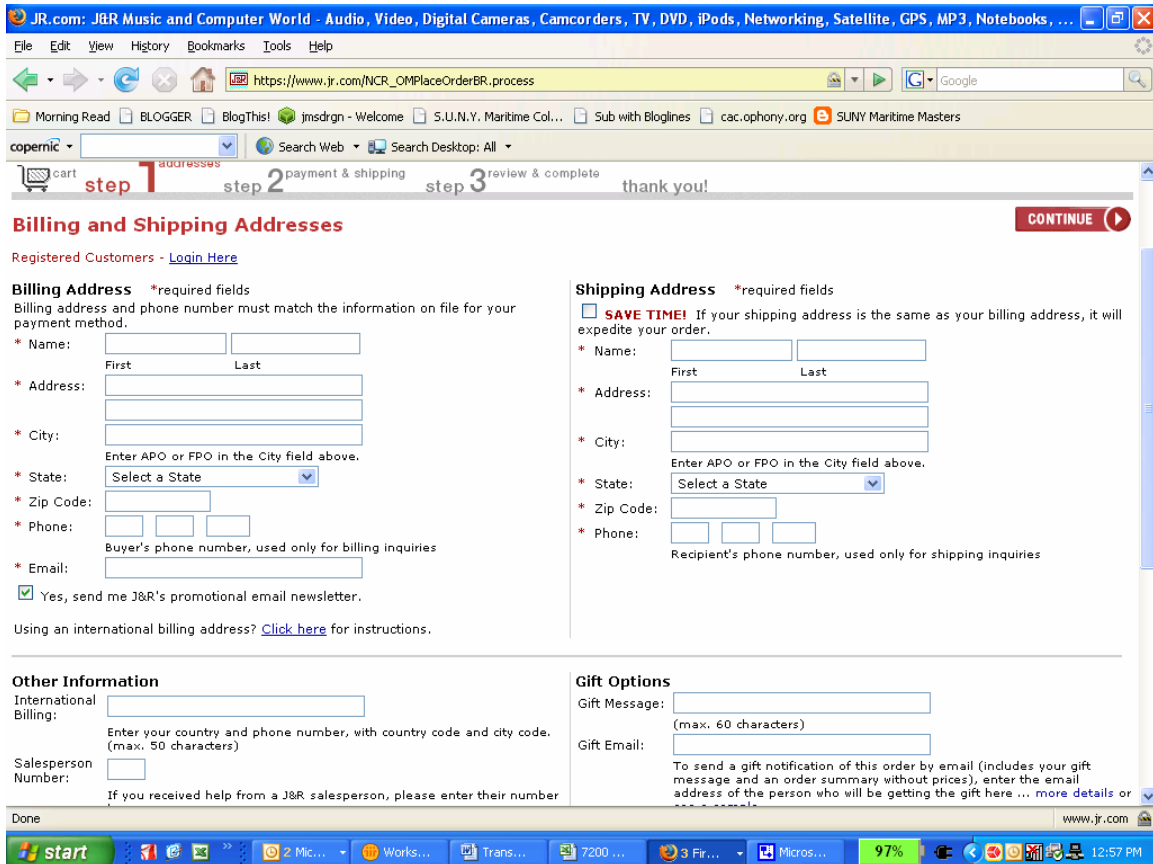


Figure 9 The Order<sup>4</sup>

The order starts everything. It indicates your demand for the product and hence demand for transportation.

In Figure 1 Structure of Transportation Management Figure 9 The Order (represents step 1 of the J&R order process) you supply critical pieces of information: billing information, destination information. Step 2 will collect the information as to how you wish to pay for the goods and step 3 allows you to make a final review before you commit.<sup>5</sup>

Let's review the information at hand.

Origin	We do not yet know the origin of the shipment. Upon the start of the transportation portion of the fulfillment cycle this will become evident through something called an origin scan by UPS.
Physical Flow	We do not know yet anything about the physical flow.
Information Flow	There have been a number of information flows to this point. <ol style="list-style-type: none"> <li>1. J&amp;R and UPS have provided you with the information necessary to make a decision to buy, and decide on the time and place utility of value to you.</li> <li>2. You have provided J&amp;R and UPS all the information necessary for the sale and to initiate the transportation process.</li> </ol>

<sup>4</sup> [https://www.jr.com/NCR\\_OMPlaceOrderBR.process](https://www.jr.com/NCR_OMPlaceOrderBR.process) [February 6, 2007]

<sup>5</sup> I did not follow through with steps 2 and 3. I didn't want to make an explanation to my bride.

	<ol style="list-style-type: none"> <li>3. J&amp;R has provided you with a confirmation of the sale which would include an order number.</li> <li>4. UPS, probably through J&amp;R, has provided you with a shipment tracking number so that you can check on the progress of the shipment.</li> </ol>
Processes	<p>A number of processes have taken place.</p> <ol style="list-style-type: none"> <li>1. J&amp;R made an offer to you through the New York Times advertisement and their online shopping site.</li> <li>2. You accepted the offer buy placing the order. Included in this process was a subprocess, executed by J&amp;R, to verify your credit worthiness.</li> </ol>
Roles and Responsibilities	<p>Buyer: This is you. Your are responsible for providing correct billing, shipping, and payment information.</p> <p>Seller: This is J&amp;R. They are responsible for accepting your order, confirming your credit worthiness, committing inventory to fulfill the order, and arranging for transportation.</p> <p>Carrier: This is UPS. They are responsible for committing the necessary transportation service move the goods from origin to from origin to destination.</p>
Destination	This is the shipping information you provided.

**Table 1 First Knowledge Checkpoint**

Now J&R's flagship store is on Park Row in downtown Manhattan (New York City). It is quite likely that your LC37SH20U is not being shipped from this store, but rather from a distribution center somewhere on the East Coast. If you are within one or two days driving distance of this distribution center, then the television is likely to come to you by truck.



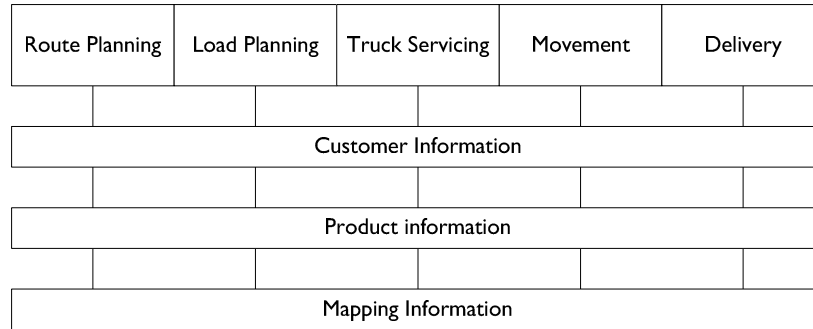
**Figure 10 UPS Truck<sup>6</sup>**

This truck would go to a distribution center, load the product you ordered, and deliver it to the destination.

The transportation portion of the fulfillment cycle can be viewed in additional detail.

<sup>6</sup> [http://www.ups.com/img/glo\\_banner1.jpg](http://www.ups.com/img/glo_banner1.jpg) [February 6, 2007]





**Figure 11 Transportation Processes and Data**

Figure 11 Transportation Processes and Data breaks out the transportation process into a number of subprocesses.

1. Route Planning establishes the route the truck will take to make its deliveries. The trade-off is one of time and expense against commitments to the customer.
2. Load Planning is arranging the shipments within the truck to minimize handling. For example, one might organize on a first-off last-loaded model.
3. Truck Servicing assures that the truck is fueled and otherwise properly prepared for the trip.<sup>7</sup>
4. Movement is the physical movement of the truck along the planned route.
5. Delivery puts the product in the buyers hands. This would require, in the case of this LCD television, a signature (delivery receipt) from the buyer.

The three long narrow bars represent data and information used by these processes.

1. Customer Information we already have discussed and is represented in Figure 9 The Order on page 7.
2. Product information is represented in Figure 6 A Source of Demand on page 4.
3. Mapping Information represents the data describing the route to be followed.

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<sup>7</sup> Has anyone ever seen a dirty UPS truck?

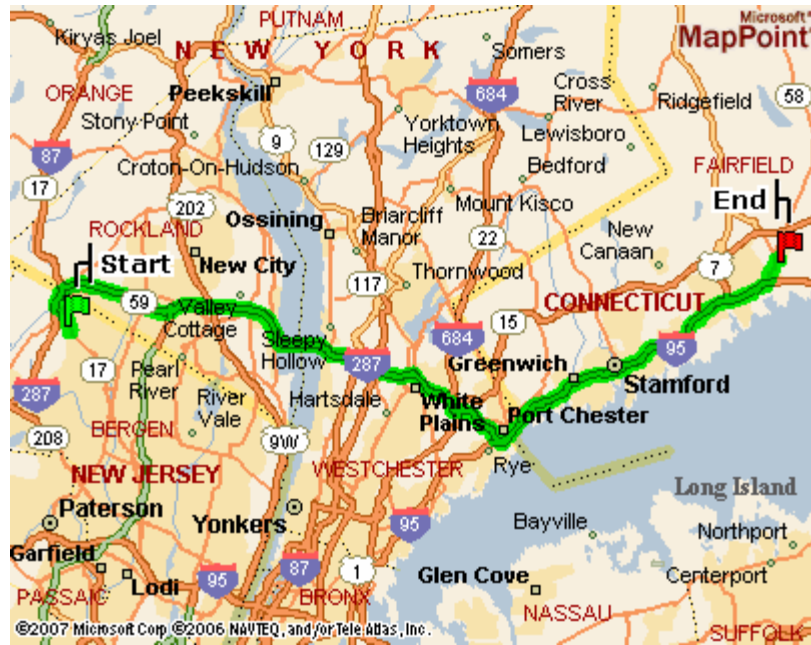


Figure 12 Mahwah NJ to Westport CT<sup>8</sup>

If one supposes that the distribution center was in Mahwah and the delivery in Westport the Figure 12 is a visualization of the relevant mapping information. One can also imagine a small icon (perhaps a picture of a van) moving along this route based on real-time data received from the truck. The mapping information could be a source for the answers when one issues a tracking request.

<sup>8</sup> [http://mappoint.msn.com/\(on4dsh55fzblmj4zliimk45\)/directions.aspx?C=41.0866208843474%2c-73.7652251029633&L=USA&A=150&PN=1103581993&S=800%2c740&P=141.0883928555995%2c-74.1530551761389|flag\\_start|Start|LI|41.1414907034487%2c-73.3584309741855|flag\\_end|End|LI|&TI=Westport%2c+Connecticut%2c+United+States](http://mappoint.msn.com/(on4dsh55fzblmj4zliimk45)/directions.aspx?C=41.0866208843474%2c-73.7652251029633&L=USA&A=150&PN=1103581993&S=800%2c740&P=141.0883928555995%2c-74.1530551761389|flag_start|Start|LI|41.1414907034487%2c-73.3584309741855|flag_end|End|LI|&TI=Westport%2c+Connecticut%2c+United+States) [February 6, 2007]

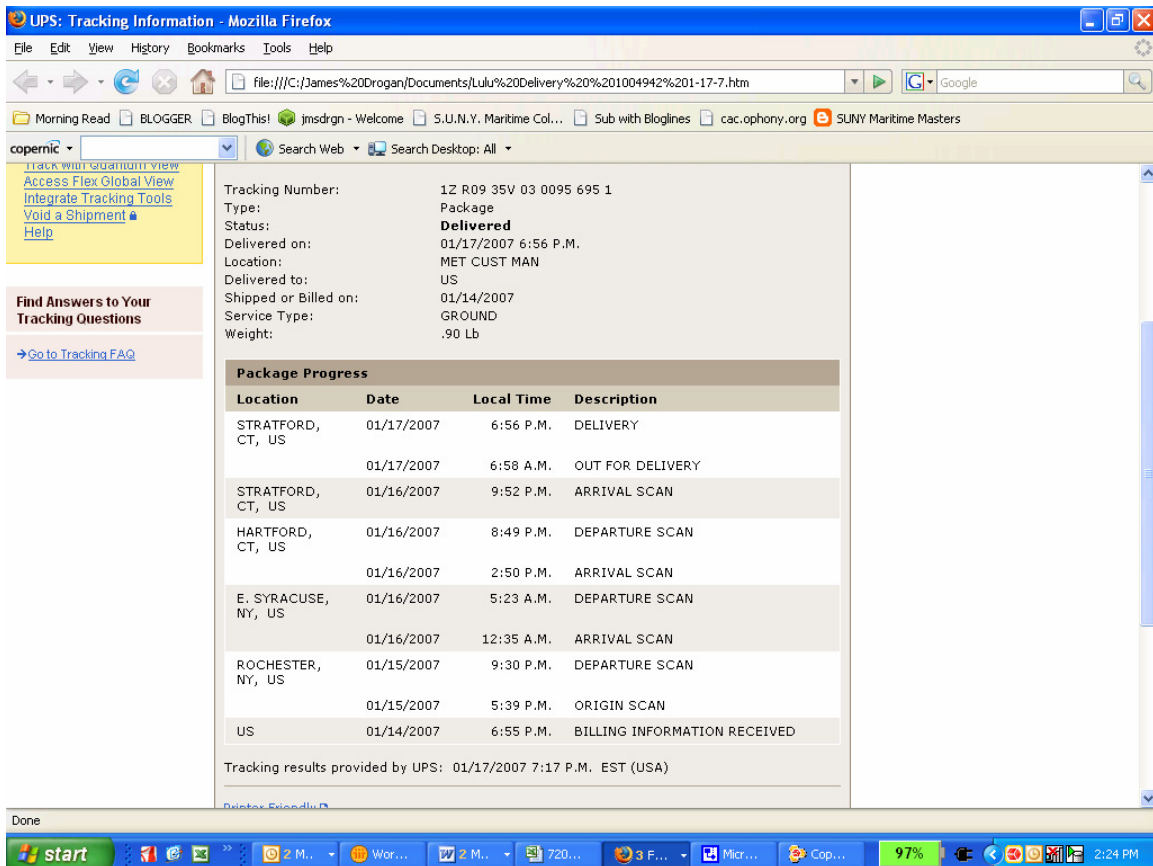


Figure 13 Tracking Information<sup>9</sup>

I mentioned Origin Scan in Table I First Knowledge Checkpoint on page 8. Figure 13 is an example of tracking information showing the origin scan. This was a software product I ordered. I had no idea of the origin when I order it. This was ground transportation and one can see how much time was spent on the road and in the UPS facilities.

Finally, here's the debit to my account representing closure of the loop on the transaction represented in Figure 13.

01-17	DEBIT CARD PURCHASE	
	LULU PRESS, INC 919-45	\$ 15.31

## Summary

This note has taken up a simple example of transportation, looking at it through the lens posited in Introduction to the Course and Transportation Management and recapitulated in the Introduction of this document.

The structure presented herein and the underlying approach to critical thinking will continue to be employed in looking at a number of remaining issues in transportation management.

James Drogan  
 February 6, 2007

<sup>9</sup> file:///C:/James%20Drogan/Documents/Lulu%20Delivery%20%201004942%201-17-7.htm